



## Original Clinical Research

### B001

#### Efficacy of hydroxychloroquine in 43 patients with oral lichen planus

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**Objectives:** To evaluate the clinical response to hydroxychloroquine (HCQ) in patients with oral lichen planus (OLP) using a validated oral disease severity scoring tool (ODSS).

**Methods:** A retrospective analysis of therapeutic response to HCQ using an ODSS was undertaken at 3-monthly intervals for 43 patients with moderate or severe OLP. Thirty-nine females and four males, mean age 55.2 ± 9.54 years, with pure oral (n = 24), vulvo-vaginal-gingival (n = 15), oro-genital (n = 3), peno-genital LP (n = 1) were treated during a mean follow up 21.7 ± 18.54 months (range 9–96 m). Oral Health Impact Profile-14 scores (OHIP-14) were recorded in 11 patients. The mean change in ODSS (baseline-final score) and mean scores at 3 and 6 m were analysed. HCQ was prescribed as monotherapy in 36 (83.7%) or as adjunctive systemic therapy in 7(16.3%) (prednisolone (n = 6), mycophenolate mofetil (n = 1)).

**Results:** Overall 32/43 (74%) patients improved during 14.49 ± 8.74 months (range 3–51 m) treatment with a reduction in ODSS from initial 27.00 ± 8.84 to a final score 21.63 ± 11.70 (P = 0.005). By 3 m the ODSS had reduced to 21.24 ± 8.76 (P < 0.0001) and at 6 m to 20.69 ± 11.09 (P = 0.002).

Thus 18/43 (42%) patients had improved by 3 m and 24 (56%) by 6 m. ODSS improved by <25% in 13 (30.2%), 25–50% in 10 (23.3%), 50–75% in 3 (7%) and >75% in 6 (14%). Eleven patients (23%) had static/worsening scores. The mean OHIP-14 reduced by 8.64/14 ± 6.01 points (P = 0.056). Three patients stopped HCQ due to side effects (hair loss, gastrointestinal upset or rash).

**Conclusion:** In the largest case series to date, we have shown both the efficacy and good side effect profile of HCQ in the treatment of OLP as a monotherapy or an adjunct to other systemic treatment.

**Relevance:** Moderate to severe OLP is associated with significant morbidity, impairs quality of life and often requires systemic therapy. HCQ is a potentially safer alternative to immunosuppressant therapy when topical treatment alone is ineffective.

### B002

#### Oral cancer staging in a Brazilian oral medicine service

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Oral cancers detected in the early stages are related to better survival rates (80–90%). Unfortunately, the majority of cases are diagnosed at a later stage. The onset of oral cancer is frequently painless and asymptomatic. The aim of this study was to analyze the oral cancer stages of patients admitted in a Brazilian Oral Medicine Service, from the Faculty of Odontology of Araraquara, Brazil. We collated data from clinical files between 2009 and 2015. Inclusion criteria were histopathological confirmation of oral cancer, and clinical files completely filled. Exclusion criteria comprehended clinical files of patients diagnosed with larynx and oropharynx cancer. A total of 65 clinical profiles were retrieved. Of the 65 cases, 56 were male, and 9 while females. The mean age was 61 ± 14.1 years. Of which, 63 were from white ethnicity and 2 of non-white ethnicity. 40 patients were married, 10 widowed, 8 divorced and 7 single. The most common location was the lips (23), followed by the tongue (19), floor of the mouth (9), buccal mucosa (8), palate (5) and alveolar ridge (3). Oral cancer cases were predominantly diagnosed in Stage I (34), followed subsequently by Stage IV (12), Stage III (3) and Stage II (8). Thus, we can conclude that early intraoral cancer is harder to be diagnosed due to the lesion low visibility and absence of pain. Furthermore, we emphasize the importance of general dentists being aware of oral cancer and to screen for this disease in their daily clinical practice.

### B003

#### The effect of primary Sjögren's syndrome on smell, taste and sexuality in female patients in the UK: impact on quality of life

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Sjögren's Syndrome is an autoimmune rheumatic disease of unknown origin, affecting women nine times more commonly than men. Dryness of the mucosal surfaces is the main

characteristic of this syndrome, which can lead to functional impairment and interfere with quality of life (QoL).

**Objectives:** (1) To assess the smell and taste function in primary Sjögren's Syndrome (pSS) patients and its relation to the severity of mucosal dryness and neurological impairment. (2) To assess the prevalence of sexual dysfunction in pSS patients (3) To evaluate the effect of smell, taste and sexual function on the mental health well-being and QoL.

**Methods:** Preliminary case control study was carried out on 13 pSS females and 12 matched healthy controls. Mouth dryness was assessed by clinical oral dryness score and salivary flow rate. The smell and taste function was measured using validated clinical tests. General and oral health related QoL, mental health well-being and sexual functioning were assessed by validated relevant questionnaires.

**Results:** The salivary flow rate was considerably less in pSS patients. There was a significant difference between the smell acuity in pSS patients (27.46 ± 8.23) compared with healthy volunteers (33.54 ± 4.63). Similarly, the taste sense was affected significantly more in pSS patients (7.84 ± 2.99) compared with healthy controls (12.81 ± 2.39). There is evidence that neurological impairment affecting the sense of taste in pSS patients. The self-administered questionnaires showed that pSS patients have less sexual function (14.31 ± 10.06) compared with healthy controls (22.29 ± 13.86) and that the QoL of pSS patients was negatively impacted. Mental health well-being of the pSS patients was lower than that of healthy participants although it was still within the normal range.

**Conclusion:** Preliminary analysis of the results show that pSS has a multidimensional negative impact on patients' well being.

### B004

#### Review of the literature: invasive fungal infections in patients with leukemia

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**Objectives:** To assess the current state of the scientific literature of invasive fungal infections in patients with leukemia.

**Methods:** A comprehensive literature search was conducted by searching the international biomedical literature databases. PubMed/Medline (National Library Medicine, Bethesda, Maryland) were searched using different combinations of the following keywords: leukemia and candidiasis. Study selection:

Inclusion criteria: full-articles were included if they met the inclusion criteria with respect to types of studies, types of population and the main outcome/s regardless of time period of study and year of population.

Types of studies: the studies had to be original studies, cross-sectional studies, comparative studies (leukemia group and healthy control group) and only humans. Review articles, experimental studies, longitudinal studies, case reports, commentaries, letters to the Editor and unpublished articles were excluded.

Exclusion criteria: studies were excluded if they were published in a language other than English. We also excluded studies if they solely reported prevalence of leukemia/candidiasis among persons with leukemia in relation to the total population (leukemia and non-leukemia).

**Results:** The initial search yielded 60 studies. Thirty-eight studies, which did not fulfill the eligibility criteria, were excluded. A total of eighteen articles were included and processed for data extraction.

**Conclusions:** Invasive fungal disease represents a major complication in patients with haematological malignancies and in haematopoietic cell transplant (HCT) recipients.

Fusariosis and IA are the leading mycoses in patients with leukemia. There was no candidemia occurring among hematopoietic stem cell transplantation recipients, which support the success of antifungal prophylaxis before engraftment.

The evolution of the colonizing *C. albicans* flora and the selection of variants or replacement of the original strain upon antifungal drug pressure or nosocomial transmission are rare events in neutropenic patients with de novo acute leukemia. Antifungal prophylaxis can reduce the incidence of candidemia through a reduction or the eradication of susceptible colonizing yeasts.

Voriconazole appears to be safe and effective for secondary prophylaxis of systemic fungal infection after allogeneic stem cell transplantation.

## B005

**Validity of ultrasonography in the diagnostic work-up of Sjögren's syndrome**

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Salivary gland ultrasonography (sUS) is used in clinical practice to identify patients with Sjögren's syndrome (SS). We assessed the validity of sUS compared to parotid gland biopsy, labial biopsy and sialometry in patients clinically suspected with SS.

104 consecutive outpatients clinically suspected with SS underwent sUS of all four major salivary glands. sUS characteristics evaluated were parenchymal echogenicity, homogeneity, hypoechogenic areas, hyperechogenic reflections and salivary gland posterior border. The total score was calculated as the sum of these five domains (range 0–48), according to the Hocevar scoring system. All the patients were subjected to a complete diagnostic work-up according to the American-European Consensus Group classification criteria. sUS results were compared with results from parotid (n = 66) and labial (n = 54) gland biopsies, and sialometry (unstimulated (UWS) and stimulated (SWS) whole saliva; n = 99).

The median age was 51 years (range 18–82), 90% were female and median sUS score was 12 (range 3–43). Accuracy of sUS to predict positive biopsy of the parotid (AUC 0.829; 95% CI 0.700–0.957) and labial (AUC 0.816; 95%CI 0.700–0.931) gland was moderate. When using biopsy as the 'gold standard', the optimal cut-off point for positive sUS was 15 and 14 for parotid and labial biopsies, respectively. Agreement between sUS positivity and positive parotid gland biopsy was substantial ( $\kappa = 0.600$ , sensitivity 74%, specificity 87%). Agreement between sUS positivity and positive labial biopsy was moderate ( $\kappa = 0.556$ ; sensitivity 70%, specificity 85%). The optimal cut-off point for positive sUS using sialometry as 'gold standard' was 15. Agreement between sUS positivity and abnormal UWS was fair ( $\kappa = 0.333$ ) and abnormal SWS slight ( $\kappa = 0.198$ ). Reversed associations between sUS scores and UWS and SWS were fair ( $\rho = -0.073$ ) and moderate ( $\rho = -0.404$ ), respectively.

sUS showed moderate to substantial agreement with positive salivary gland biopsy and slight to fair agreement with abnormal sialometry in patients suspected with SS. Thus, sUS cannot replace salivary gland biopsies at group level, but sUS might be useful in choosing whether salivary gland biopsies should be performed at individual patient levels in daily clinical practice.

## B006

**Xerostomia and salivary flow rate in haemodialysis patients**

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**Objectives:** The aim of this study is to determine the prevalence of xerostomia and hyposalivation in a group of HD patients, to clarify the risk factors associated with xerostomia in these patients, and to assess the patient's quality of life. The study also tries to establish a connection between interdialytic weight gain (IDWG), xerostomia and hyposalivation in HD patients.

**Methods:** This study was performed on a group of 50 HD patients (35 men and 15 women) treated in a haemodialysis clinic in Alcázar de San Juan, Spain. Data were collected using a questionnaire containing demographic and clinical variables, a visual analogue scale (VAS) for xerostomia, IDWG, and oral health impact profile (OHIP-14) questionnaire. Unstimulated whole saliva (UWS) and stimulated whole saliva (SWS) were collected.

**Results:** 28 patients (56%) suffered xerostomia. Dry mouth was significantly associated with hypertension (OR, 5.24; 95% CI, 1.11–24.89) and benzodiazepine consumption (OR, 5.96; 95% CI, 1.05–33.99). The mean xerostomia VAS and OHIP-14 scores were  $31.74 \pm 14.88$  and  $24.38 \pm 11.98$ , respectively; therefore, xerostomia was higher in these patients. UWS and SWS were only determined in 30 patients that received HD treatment in the morning, with mean UWS and SWS of  $0.16 \pm 0.17$  and  $1.12 \pm 0.64$ , respectively. Decreased values of UWS and SWS were reported in 53.33% and 36.66% of patients. There was no relationship between the volume of UWS, SWS, and xerostomia.

**Conclusions:** Xerostomia in HD patients has a multifactorial aetiology due to accumulative risks including advanced age, systemic disorders, drugs, fluid intake restriction, and salivary parenchymal fibrosis and atrophy. Dry mouth could have influenced the increase of IDWG and quality of life of these patients. Therefore, it is important to detect possible xerostomia risk factors to treat correctly dry mouth in HD patients and avoid possible systemic complications.

**Relevance:** It is important to detect possible xerostomia risk factors to treat correctly dry mouth in HD patients and avoid possible systemic complications.

## B007

**Clinical photography in oral medicine; a comparison study**

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**Objective:** To study the attitudes towards the role of professional clinical photography in oral medicine.

**Methods:** Questionnaires were completed by students and Oral Medicine clinicians at Hadassah School of Dental Medicine (Israel) and Birmingham Dental Hospital (UK). Clinical photography was available at the Oral Medicine Clinic in Israel and conducted in a different unit in the UK. Pearson Chi-squared tests were employed for testing the statistical significance of categorical variable differences ( $P < 0.05$ ).

**Results:** 183 participants (96 from UK; 87 from Israel), included 166 students and 17 clinicians. 70% of participants reported positive attitudes to technology. The main reasons for not using photography were time constraints and access. Participants reported using photography for clinical follow up appointments (93.8%), patient presentation (81.3%) teaching (62.5%) medical communication (50%) and research (25%).

Overall, the highest consensus (over 97%) for the ideal professional usage of clinical photography was for teaching and monitoring premalignancy. Referring to values placed on photographing pathologies, the highest agreement was for dysplastic lesions (97%) followed by other potentially malignant conditions, benign lesions and diseases (60%). The Israel participants were more in favour of photographing simple leukoplakia, reticular lichen planus, vesiculobullous or pigmented lesions ( $P < 0.001$  for each). The same was true for follow-ups ( $P < 0.001$ ) teaching ( $P = 0.002$ ), or referrals ( $P = 0.002$ ). There were no significant differences between clinicians vs. students or male vs. female.

**Conclusions:** The important perceived role of clinical photography in oral medicine is demonstrated for clinical, teaching and communication, with highest agreement across groups for the follow-up of premalignancy. The degree of its reported importance for any purpose does not appear to be related to experience or gender and may be related to physical access and clinical setting.

**Relevance:** In order to maximize the potential benefits of clinical photography, access to facilities could be investigated further.

## B008

**MicroRNA expression across clinical sample types in oral mucosal disorders**

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**Introduction:** MicroRNA (miRNA) expression reflects cellular activity and remains of interest in the development of oral squamous cell carcinoma (OSCC). Majority of OSCC miRNA sequencing data has been on retrospective analysis of resection samples. Comparison of prospective clinical samples with formalin fixed paraffin embedded (FFPE) specimens is required to translate application of retrospective OSCC genomic studies to chairside tools, particularly for potentially malignant mucosal disorders.

**Objectives:** To compare miRNA expression across three tissue types in patients with benign conditions, oral lichen planus, dysplasia and OSCC using next generation sequencing.

**Methods:** Salivary swirl samples, epithelial scrapes and matched FFPE mucosal biopsy samples of 12 patients had total RNA isolated using the mirVana™ miRNA and Recover™ All isolation kits. Next generation sequencing using a small RNA Ion Torrent S5™ platform was utilized and small RNA specific bioinformatics analyses undertaken to assess distribution and relative abundance of miRNAs within and across samples.

**Results:** RNA yield from clinical samples varied between collection techniques, across individuals and was markedly lower than that from formalin fixed paraffin embedded tissue. Preliminary findings indicate significant variation of specific miRNA abundances across different clinical sample types and within different disease states. Such variation is likely to have clinical and prognostic relevance.

**Conclusions:** Translation of findings from retrospective sequencing studies to clinical samples remains challenging. Variability in miRNA expression between tissue compartments should be considered. Prospective risk stratification tools may require simultaneous collection of different sample types from individuals.

**Relevance:** The development of robust methods of prospective clinical sample isolation to supplement retrospective tools for miRNA analysis is a move towards the development of risk stratification for OSCC prediction.

**B009****Antipsychotics in the treatment of burning mouth syndrome**D Adamo<sup>1</sup>, E Ruoppo<sup>1</sup>, A Celentano<sup>1</sup>, M Aria<sup>2</sup>, S Leuci<sup>1</sup>, MD Mignogna<sup>1</sup><sup>1</sup>Department of Neurosciences, Reproductive and Odontostomatological Sciences, University Federico II of Naples, Italy, <sup>2</sup>Department of Economics and Statistics, University Federico II of Naples, Italy

**Objectives:** To identify a cluster of patients with Burning Mouth Syndrome (BMS) who presented atypical symptoms (AS), such as globus pharyngeus (GP), dysgeusia (DG), dysosmia (DO), occlusal dysesthesia (OD), oral dysmorphic disorder (ODD) or oral and perioral dyskinesia (OPD), and were unresponsive to topical clonazepam and antidepressants, and to analyze their response to treatment with perphenazine.

**Methods:** We analyzed 209 BMS patients; 22 (10.5%) were referred with AS and included in the trial and were treated with perphenazine in addition to other antidepressants. Demographic characteristics and clinical information were collected. Questionnaires examining pain [the Visual Analogic Scale (VAS)], depression and anxiety [the Hamilton rating scales for Depression (HAM-D) and Anxiety (HAM-A)] were performed during the first examination (time 0) and after 6 months of therapy with antidepressants (time 1), and after 6 months (time 2) and 12 months (time 3) of treatment with perphenazine. Descriptive statistics and the Wilcoxon non-parametric test for two paired-samples were used.

**Results:** The mean age of the patients was 64.1 ± 13.0. At time 0 the BMS patients with AS showed statistically higher scores in the HAM-D, HAM-A and VAS compared with the scores evaluated after treatment with antidepressants (time 1) and with perphenazine (times 2 and 3). At time 0, the median and inter-quartile range of the HAM-D, HAM-A and VAS were 24 [22–26], 22 [22–25] and 10 [10–10]; at time 1 they were 20.5 [18.3–22.3], 20.0 [18.0–22.3] and 8.0 [7.3–8.8]; at time 2 they were 16.0 [14.0–18.0], 13.0 [13.3–16.0] and 4.0 [3.0–5.0]; and at time 3 they were 12.0 [9.0–12.0], 10.0 [9.0–11.0] and 1.0 [0.0–2.0] respectively.

**Conclusions:** The results of the study lead to the conclusion that BMS patients with AS, unresponsive or partially responsive to conventional treatment, could present a more severe psychiatric involvement, borderline with a psychotic trait.

**Relevance:** Antipsychotics could be a new class of drugs useful for the treatment of BMS patients with AS.

**B010****A consistent method for RNA extraction from salivary extracellular vesicles**

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**Objectives:** Here we report preliminary data regarding the extractions, isolation and characterization of extracellular vesicles (EVs) in saliva of oral cancer patients and healthy controls. To the best of our knowledge, such analyses have never been successfully performed in a simple manner.

**Methods:** Saliva collected was diluted 1:1 with PBS and centrifuged at 3000 g for 15 min at room temperature to remove cells and debris. Saliva was then filtered with 0.2 µm filters. EVs were precipitated by incubation overnight at 4°C using a precipitation solution. After centrifugation at 1500 g for 30 min, the product obtained was re-suspended with PBS for analysis: the mean size and concentration of EVs were calculated using the Nanoparticle Tracking Analysis (NTA) software on a NanoSight LM10 system (NanoSight Ltd., Amesbury, UK), in accordance with the manufacturer's instructions. Total RNA was isolated from vesicles precipitated from saliva using the mirVana RNA isolation kit (Ambion). RNA was spectrophotometrically quantified (Nanodrop ND-1000, Wilmington DE). Total RNA was extracted from purified EVs and miRNAs selectively reverse transcribed and pre-amplified. The TaqMan® Array Human MicroRNA was used to profile 754 human miRNAs.

**Results:** Purified EVs from OC patients observed under transmission electron microscopy offered a heterogeneous morphology compared to control salivary EVs. Within the first array-based screening, we have successfully identified different up and down regulated miRNA.

**Conclusions:** We have positively implemented a simple and repeatable method to extract miRNA from salivary EVs in oral cancer patients.

**Relevance:** Circulating miRNAs are one of the most promising next-generation biomarkers for cancer diagnosis, establishing the novel concept that EV miRNAs could have potential not only as putative biomarkers but also for reflecting cancer progression. Isolation of EVs from unstimulated saliva could be a useful and simple method for biomarker detection in different pathological conditions.

**B011****Core outcome set for recurrent aphthous stomatitis: a collaborative approach**J Taylor<sup>1</sup>, AM Glenny<sup>2</sup>, T Walsh<sup>2</sup>, P Brocklehurst<sup>3</sup>, M Pemberton<sup>1</sup><sup>1</sup>Oral Medicine Department, University Dental Hospital of Manchester, Manchester, UK,<sup>2</sup>School of Dentistry, University of Manchester, <sup>3</sup>NWORTH Clinical Trials Unit, Bangor University, Wales

**Objectives:** To develop a core outcome set (COS) for recurrent aphthous stomatitis (RAS) using live interactive consensus.

**Methods:** Mixed methodology.

- 1 Patient involvement.
- 2 Systematic review of outcome measures in randomised controlled trials (RCTs) of interventions for RAS.
- 3 Consensus methodology using live face-to-face interactive clicker technology (Turning Point) Participants vote on level of importance of each individual outcome.

**Results:**

- 1 Focus group of 7 RAS patients agreed on 6 key outcomes.
- 2 73 studies were included in the systematic review. 310 outcome measures were identified in total. After removing duplications, 22 key outcomes were identified (including all 6 of the patient outcomes identified from the focus group).
- 3 Consensus was reached on 13 outcomes for RAS (all 6 patient key outcomes included).

**Conclusions:** This project demonstrates that consensus can be achieved using a live interactive clicker process, potentially avoiding the need to use a traditional Delphi research methodology.

**Relevance:** RAS is the most frequent form of oral ulceration. It causes intermittent episodes of painful oral ulcers which can cause a considerable morbidity and can affect the quality of life of patients.

The evidence base for managing RAS is of a poor quality due to multiple methodological issues in the design and reporting of clinical trials. Pooling of data for meta-analyses has not been possible due to the heterogeneity of outcome measure for RAS.

Core outcome sets are the minimum outcomes that should be measured for every trial. Future use of a COS for RAS would allow like for like comparisons in future systematic reviews. COS are developed by consensus with relevant stakeholders. Previous published COS studies have incorporated large scale Delphi projects which can be expensive and time-consuming, with high attrition rates.

Live interactive clicker voting is an innovative way to gain collaboration between relevant stakeholders in agreeing consensus.

**B012****Oral ulcerative-vesiculo-bullous conditions: clinical and histopathological diagnoses - accordance or discordance?**Y Goldman<sup>1</sup>, N Yarom<sup>1,2</sup>, I Schwartz<sup>3</sup>, M Vered<sup>1,3</sup><sup>1</sup>Department of Oral Pathology and Oral Medicine, School of Dental Medicine, Tel Aviv University, Tel Aviv, Israel, <sup>2</sup>Oral Medicine Clinic, The Chaim Sheba Medical Center, TelHashomer, Israel, <sup>3</sup>Institute of Pathology, The Chaim Sheba Medical Center, Tel

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**Objectives:** Accurate diagnosis of oral ulcerative-vesiculo-bullous conditions requires combined clinical, histopathological and immunofluorescence evaluations. We analyzed whether there is accordance/discordance between the clinical and histopathological diagnoses in a large series of cases.

**Methods:** 203 oral cavity biopsies with 380 clinical differential diagnoses of ulcerative-vesiculo-bullous conditions performed between 2010 and 2015 were retrieved. Histopathological diagnoses served as the "golden standard" and included: pemphigus vulgaris (PV), oral pemphigoid (OP), oral lichen planus (OLP), lichenoid reaction (LR), erythema multiforme (EM), non-specific ulcer/inflammation (Inflam), normal-looking oral mucosa (NM), epithelial hyperplasia with/without dysplasia (clinical leukoplakia, LK) and a variety of additional diagnoses (e.g., median rhomboid glossitis, systemic lupus erythematosus, linea alba, candidiasis) that were collectively defined as "others" (Other). Measure of accordance was assessed by Kappa, statistical significance was set at P < 0.05.

**Results:** The frequency of the histopathological diagnoses was Inflam (23%), EM (17%), OLP (16%), LK (12.8%), Other (8.4%), OP (5.9%), NM (3.4%) and LR (2.5%). The frequency of the clinical diagnoses was OLP (33.9%), Other (18.7%), PV (15.8%), LR (10.5%), OP (10.3%), LK (5.8%), EM (4.2%) and Inflam (0.26%). Kappa between the histopathological and clinical diagnoses for PV and LK was 0.34 (P < 0.001), for OLP – 0.29 (P < 0.001), LR – 0.24 (P < 0.001) and for EM – 0.14 (P < 0.001). Kappa for Inflam showed discordance (–0.006, P > 0.05) and for OP (0.03) it was statistically non-significant.

**Conclusions:** Ulcerative-vesiculo-bullous lesions that involve the oral mucosa are a heterogeneous group of conditions with overlapping clinical features, which might be affected by duration of the disease and its stage at presentation. This can explain the general low accordance that we found between the clinical and histopathological examinations.

**Relevance:** Histopathological examination of ulcerative-vesiculo-bullous lesions is essential for accurate diagnosis, on the basis of which decision about the appropriate management, will be made.

### B013

#### Oral Candida colonization in blind and visually impaired persons

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**Objectives:** Prevalence of blindness and visual impairment is 285 million worldwide, 39 million are blind and 246 million have low vision according to the World Health Organization. Dental caries, periodontal diseases, orthodontic anomalies in addition to soft tissue lesions are some of the problems that occur in blind and visually impaired persons. The aim of this study was to determine colonization of the oral cavity with *Candida species* (*Candida spp.*) and oral candidiasis in blind and visually impaired persons.

**Methods:** The study included a total of 50 participants, 25 participants with full or partial loss of vision (17 males, 8 females, mean age 64.04 ± 13.1) and 25 participants as control with normal vision (16 males, 9 females, mean age 62.2 ± 12.1). Inspection of the oral cavity was performed in a systematic procedure. Oral cavity was considered as colonized with *Candida spp.* in the case of positive microbiological analysis and normal oral mucosal appearance. Specimens were isolated from oral cavities with sterile swabs (Copan, Zagreb, Croatia) and were inoculated on Sabouraud's dextrose agar. Cultures were incubated at 37°C and after 48 h the count of colony-forming units was recorded. The evaluation was made according to the number of the colonies described by Budtz-Jorgensen.

**Results:** Thirty-six percent of blind and visually impaired persons in our study were colonized with *Candida spp.* This result was statistically similar compared to the participants with the normal vision (40 %;  $P = 0.8451$ ).

**Conclusion:** Results of this study showed similar colonization of the oral cavity with *Candida spp.* in blind and visually impaired persons and in persons with normal vision.

**Relevance:** Further investigation with a larger number of subjects is necessary to confirm the accuracy of the results.

### B014

#### The spectrum of oral lesions presenting clinically with papillary-verrucous features

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**Objectives:** To study the spectrum of oral pathologies presenting clinically with papillary-verrucous features.

**Materials and methods:** A 10 year retrospective study of oral papillary lesions, 2007–2016. All biopsies which included a clinical description of papillary or verrucous architecture were retrieved. The data collected included clinical features, age, gender, size, colour, location and histopathological diagnosis.

**Results:** The study included 137 patients (151 lesions), 67 males (5 patients had >1 lesion, 1 patient had 4 lesions), 70 females (6 patients had >1 lesion), age range 10 weeks–84 years, mean 49 years. 60% of cases were HPV induced, 19% hyperplasia, 11% hyperplastic candidiasis, 7% were dysplastic or malignant and 3% were benign of unknown etiology. Of the 7% diagnosed with dysplasia or malignancy, only 60% were suspected for malignancy at the time of biopsy.

HPV-related lesions as well as hyperplasia were most frequently found on the tongue (38%, 41%) and soft palate (21%, 14%) respectively. Hyperplastic candidiasis was most frequent on the buccal mucosa and tongue (35%, 24%) respectively. 1.3% of total lesions were found to be SCC and 1.3% Verrucous Ca. 50% of the verrucous/papillary malignant lesions were found on the gingiva. Most lesions were found in the 40–60 year age group.

**Conclusion:** 7% of papillary lesions in this group were malignant/dysplastic, and a significant proportion of these had not been suspected clinically for malignancy. The results indicate that there is a need to excise and submit for histopathological diagnosis all oral papillary lesions.

### B015

#### Thrombin generation assay and autoimmune bullous diseases

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**Objectives:** Pemphigus vulgaris and mucous membrane pemphigoid are autoimmune bullous diseases (ABD) with an increased risk of thromboembolism. Although the link

between the immune system and blood coagulation is well described, conventional coagulation tests fail in recognizing significant pro-thrombotic anomalies in ABD patients. Thrombin generation assay (TGA) measures the overall tendency of a plasma sample to form thrombin after initiation of coagulation. Preliminary observations suggest a promising role for TGA in assessing the pro-thrombotic status in patients with systemic autoimmune diseases. The aim of this study was to investigate the activation of blood coagulation in ABD patients with TGA.

**Methods:** We cross-sectionally analysed plasma samples from 18 pemphigus (F 11, mean age 57.5), and 12 pemphigoid patients (F 8, mean age 74.6). We matched the results with 20 healthy controls (HC). TGA was tested by a commercially available assay kit (Technothrombin-TGA kit, Technoclone, Austria). Clinical, histological (light and IF microscopy) and laboratory parameters (including anti-desmoglein, anti-BP180/230 antibodies) were compared among groups.

**Results:** A pro-thrombotic misbalance of TGA parameters was observed in patients with ABD compared to controls. TGA revealed an elevation of Peak in ABD patients (pemphigoid group: mean = 244.33 ± 115.61 nM,  $P = 0.087$ ; pemphigus group: mean = 254.17 ± 79.07 nM,  $P = 0.008$ ; control group: mean = 181.24 ± 71.46 nM) and a significant elevation of area under the curve in patients with pemphigoid (mean = 2301.6 ± 318.8 nM,  $P = 0.018$ ; HC: mean = 2047.23 ± 270.8 nM). We observed a significant decrease of time to Peak (pemphigoid group: mean = 13.78 ± 3.56 min,  $P = 0.012$ ; pemphigus group: mean = 13.86 ± 2.8 min,  $P = 0.02$ ; HC: mean = 17.22 ± 3.14 min) and Lag time (mean = 8.67 ± 2.32 min,  $P = 0.027$ ; mean = 8.73 ± 1.86 min,  $P = 0.15$ ; mean = 10.36 ± 1.5 min respectively). One patient with remarkably deranged TGA parameters had a previous history a retinal venous thrombosis.

**Conclusions:** Patients with ABD showed a pro-thrombotic status compared to HC when evaluated by TGA.

**Relevance:** TGA might represent a valid tool to identify ABD patients with increased risk of thromboembolic event.

### B016

#### Utility of screening tools in a facial pain patient cohort

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**Objectives:** Diagnostic screening tools can serve as valuable aids for triaging of patients, for diagnostic and research purposes. This study evaluates the utility of validated patient pain reported screening tools in a hospital-based cohort of orofacial pain patients.

**Methods:** A prospective study was conducted at a London dental teaching hospital. Questionnaires were collected from Group 1: 252 patients Pain Detect questionnaire (PDQ), Group 2: 134 patients, temporomandibular disorder screener (TMDS) and Group 3: 160 Oregon Health & Science University trigeminal neuralgia diagnostic questionnaire (OHSU). The data collected was compared with the clinical diagnosis, which served as the gold standard. Sensitivity and specificity analyses were performed.

**Results:** PDQ group: 36.9% had a diagnosis of TMD, 13.1% had a diagnosis of TN, 10.7% had a diagnosis of TNP and 2.8% had a diagnosis of BMS. The PDQ had a sensitivity of 53.92% and a specificity of 61.29% to diagnose TNP. TMDS group: 67.2% of participants had a diagnosis of TMD, 32.8% had mixed facial pain diagnosis. The TMDS had sensitivity of 86% for long and short versions and specificity of 31% for the short and 41% for the long versions. OHSU group: 31.2% had a diagnosis of TN, 31.2% had a diagnosis of TMD and 8.8% a diagnosis of TNP. The remaining included BMS, variants of TN and migraines. The OHSU questionnaire had a sensitivity of 85% and a specificity of 62% to diagnose TN.

**Conclusions:** The validated tools did not exhibit promising utility when applied to our cohort of orofacial pain patients.

**Relevance:** The context in which the screening questionnaires are applied likely contributes to variation in sensitivity and specificity. The optimal screening tool needs to reflect its target population, and can have low diagnostic efficacy when used in inappropriate settings.

### B017

#### Labial salivary gland flow rate in patients with Sjögren's syndrome

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**Objectives:** We developed a new electronic device for the sialometry of minor salivary glands. The purpose of this study was to compare the labial salivary gland (LSG) flow rate between patients with Sjögren's syndrome (SS) and healthy controls using the electronic device and evaluate the relationship between LSG flow rate and other clinical findings.

**Methods:** Labial gland saliva was absorbed using a standardized filter paper and then the filter paper was fixed between the electrodes of the device. A voltmeter in the device

shows a low value when the amount of saliva absorbed is small. LSG flow rate is estimated based on a calibration curve. LSG flow rate of 51 female SS patients and 40 female controls was measured. LSG flow rate was analyzed with age of the patients, oral subjective symptoms score (SSS; maximum score = 21), unstimulated whole saliva (UWS) flow rate, and focus score (FS) of labial salivary gland biopsy.

**Results:** The mean (SD) LSG flow rate of the SS patients was 0.44 (0.97)  $\mu\text{l cm}^{-2} \text{min}^{-1}$ . This was significantly lower than that of the controls [2.77 (1.39)  $\mu\text{l cm}^{-2} \text{min}^{-1}$ ] ( $P < 0.001$ ). LSG flow rate was not correlated with those clinical findings. However, multivariate logistic regression analysis revealed that  $\text{SSS} \geq 8$  (odds ratio = 7.263; 95% CI: 1.645–32.074;  $P = 0.009$ ) and  $\text{FS} \geq 2$  (odds ratio = 8.811; 95% CI: 1.111–69.913;  $P = 0.039$ ) were significantly associated with LSG flow rate  $< 1 \mu\text{l cm}^{-2} \text{min}^{-1}$ .

**Conclusions:** LSG flow rate of SS patients showed significantly lower values than that of the controls. When the SSS of the patient was  $\geq 8$  and the FS of the patient was  $\geq 2$ , the probability of LSG flow rate  $< 1 \mu\text{l cm}^{-2} \text{min}^{-1}$  was significantly higher than the others.

**Relevance:** LSG flow rate measurement using this device is valid for assessing SS patients.

## B018

### Determining the minimal clinically important improvement in radiotherapy-induced xerostomia

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**Objectives:** The Visual Analogue Scale (VAS) is the most common outcome measure for evaluating response to therapy in patients with radiotherapy-induced xerostomia (RIX). However, clinical interpretation of changes in VAS scores remains difficult, as little information is available regarding the change that patients perceive as beneficial. The objective of this study was to determine the minimal clinically important improvement (MCII) for VAS scores in patients with RIX.

**Methods:** We performed a secondary analysis of clinical data from a randomised sham-controlled clinical trial investigating the effectiveness of a salivary electrostimulating device in RIX (LEONIDAS-2). The primary objective was to calculate the MCII for the VAS. An anchor-based method was used to calculate the MCII using a 5-point Likert health transition scale. The health transition scale was dichotomised and used as external criterion for generating ROC curves.

**Results:** Data from 59 study participants (mean age, 62 years; 21% female) were analysed. The mean decrease in VAS was  $-16.1 \text{ mm}$  (SD 2.47) compared to baseline. The MCII was estimated to be 14 on a 100 mm VAS measuring xerostomia. Patients using active and sham devices had similar mean change scores associated with the health transition scale, indicating a consistent clinical interpretation of changes on the VAS irrespective of the treatment they received.

**Conclusions:** A mean reduction in VAS of 14.0 mm represents the MCII for RIX.

**Relevance:** We have identified, for the first time, the smallest change in VAS measurement that signifies an important improvement in RIX. This MCII represents a cut-point that can be easily incorporated as endpoint in clinical trials. It also signifies a minimal meaningful change at an individual level that can be used in clinical practice.

## B019

Abstract Withdrawn.

## B020

### Tooth loss and risk of cardiovascular disease or head and neck cancer: a single center study

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**Background:** Periodontal disease is the leading cause of adult tooth loss (TL) and has been reported to be an independent risk factor for cardiovascular disease (CVD) and head and neck cancer (HNC). We investigated the association between TL and CVD and HNC in a well-characterized cohort of 330 patients.

**Methods:** Data from dental evaluations for all new patients awaiting cardiac surgery or HNC radiotherapy between 2014 and 2015 was analyzed. The mean number of remaining teeth was stratified by sex, gender, and underlying disease (CVD or HNC) and compared to the US general population using the 1999–2004 National Health and Nutrition Examination Survey (NHANES) values. Heterogeneity was assessed by the  $\chi^2$  and the Wilcoxon/Kruskal–Wallis tests.

**Results:** A total of 144 CVD (68.4% males) and 186 HNC (70.4% males) patients were studied. Median age was CVD: 67 years (IQR: 58–76) and HNC: 59.5 years (IQR: 54–

67) ( $P < 0.001$ ). Mean of teeth present was CVD, 18.0 (SD  $\pm 0.7$ ) and HNC, 23.9 (SD  $\pm 0.6$ ) ( $P < 0.001$ ). Patients with CVD had a significantly fewer teeth than the general population ( $P < 0.01$ ). No differences in tooth number was observed between HNC patients and the general population ( $P = 0.60$ ). Accounting for age, older individuals among CVD patients had fewer teeth compared to younger patients ( $P$  for trend  $< 0.01$ ). However, no statistical significant differences in numbers of teeth were noted among HNC patients when age and smoking status was considered ( $P = 0.15$  and  $0.31$ , respectively).

**Conclusions:** Whereas our data is consistent with findings supporting an association between TL and CVD risk, they fail to support a similar conclusion relative to TL and HNC risk. Our results confirm the need for larger, prospective studies to definitively assess chronic oral inflammatory disease as a risk for malignancy and to elucidate the pathobiology of its potential association with risk of systemic disease.

## B021

### A 3-year e-learning programme to early detection/prevention of oral cancer

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**Objectives:** A complete program of education was created on a national scale with the support of the National Association of Italian Dentists to raise oral cancer awareness and screening attitude among Italian General Dental Practitioners.

**Methods:** The project was divided in 3 phases. Phase 1 is a free, web-based training, followed by phase 2 with face-to-face lectures and phase 3 with operative sessions with patients. Phase 2 and 3 are for a fee (30 Euros) and available after evaluation tests with the aim to know the candidates' background and their specific training. The evaluation exam encompassed 30 questions, where candidates had to exceed the 70% of correct answers. At the end of each phase, candidates downloaded papers, documents and didactic materials for free.

**Results:** Participants of phase 1 were 5,000 of which 1,114 (77.7%) completed the free program. Participants of phase 2 were 2,029 of which 1,257 (62%) completed the final exam and the following phase 3. The majority of participants were male (72.8%) aged between 45 and 64 from the North of Italy (61.5%) with a degree in dentistry.

**Conclusion:** The current system of post-graduate training is insufficient to ensure adequate preparation suggesting mandatory annual courses. Specific education programs with training modules on the primary/secondary prevention of oral cancer are needed and ethically obligatory. Interactive teaching methods can reach this goal, with practical sessions in which learners could develop skills in clinical reasoning, either talking directly with patients or through Problem-Based Learning (PBL) in working groups.

**Relevance:** The “best treatment” for oral cancer is early diagnosis, which ensures improved prognosis and relies much less on the healthcare system. Early diagnosis is based on a widespread awareness among medical and dental classes, on the acquisition of a clinical attitude that brings all professionals to systematically inspect the oral cavity.

## B022

### Gingival involvement of oral lichen planus in 263 patients

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Oral lichen planus (OLP) is one of the most common oral mucosa disorders (2.7% in our study population of 9,595 subjects).

The goal of this study was to analyze the prevalence and clinical aspects (location, morphology and symptoms) of the gingival lesions in a total of 263 patients with OLP.

Retrospective, observational, transversal and comparative study by analysis of 9,595 patient records. Descriptive, inferential statistical analysis (Chi-Square with significance level 5%) was performed.

Gingival lesions were diagnosed in 37.6% of cases (80.8% female and 19.2% male), ages between 21 and 83 (average 58.9 years old). Erosive/erythematous/ulcerative forms (“desquamative gingivitis”) affected 91.9% of these patients (34.6% of all OLP patients), 46.2% affected both upper and lower gingiva and 71.4% in a bilateral way.

Erosive/erythematous/ulcerative OLP coexisted with other intraoral locations in 84.8% patients.

The symptoms, if present, varied from mild discomfort to severe oral pain, with the general trend increasing from the white to erosive forms. None of our oral cancer cases were associated with previous gingival OLP lesions.

OLP affects between 1-3% of occidental population and mostly females (in our study 2.7% and 73%, respectively). Around 35% of our patients have gingival involvement. Differential diagnosis with periodontal diseases is important and periodontologists should be familiar with the most common clinical aspects of gingival OLP. Additionally, in our population, 13.2% of our gingival OLP patients had no lesions in other intraoral locations, making differential diagnosis and a correct treatment difficult for the general practitioner.

**B023****Adhesion and acceptability of novel oral patches in human volunteers**

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**Objective:** Oral lesions such as Oral lichen planus (OLP) or Aphthous Ulcers are often characterised by painful or erosive oral lesions. These lesions are often treated with steroid-containing mouthwashes or creams but these preparations can be ineffective due to low drug contact times. We have created an oral adhesive patch using electrospinning technology that is able to firmly adhere to porcine and tissue-engineered oral mucosa for prolonged periods and so may be able to deliver drugs directly to a lesion. In this study we examine the adherence of drug-free oral patches in human volunteers to determine their longevity and acceptability in humans.

**Methods:** Oral patches were placed on the buccal mucosa, lateral tongue or gingiva of healthy human volunteers (with written, informed consent; n = 36) for 5 s with applied pressure and residence time measured every 10 min for up to 2 hrs. Volunteers were also asked to complete a questionnaire to provide information on patch performance, comfort-ability and acceptability.

**Results:** Oral patches were highly adherent to the human oral mucosal tissues with 100%, 89% and 86% of patches remaining adherent to the gingiva, tongue or buccal mucosa, respectively for 2 hrs. 94% of volunteers felt the patches provided good/excellent adherence and over 70% of volunteers felt no irritation whilst wearing the patches. The majority of volunteers (>70%) stated that the patches were comfortable to wear and although 16% reported moderate interference with speech over 70% stated only minor affects on saliva production and swallowing. 97% of volunteers stated that they would be willing to wear the patch twice-a-day to treat an oral lesion if required.

**Conclusion:** Electrospun oral patches were strongly adherent to different sites of the oral mucosal for prolonged periods and, overall, were well tolerated. These patches have great potential to deliver drugs directly to oral lesions.

**B024****Laser-therapy for oral mucositis: multicentric randomized double-blinded controlled paediatric study**

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**Objectives:** To demonstrate the efficacy of class IV diode laser therapy (LT) on oral mucositis (OM) in oncologic paediatrics, compared with sham therapy. Primary objective included the reduction of OM's grade (WHO scale), 7 days after LT. Secondary objectives included reduction of (1)pain (following a 0-to-10 NRS scale), (2) presence and dimension of ulcerations/erythema and (3)analgesics' need.

**Methods:** A total of 101 eligible paediatrics suffering from a WHO grade >2 chemotherapy-induced OM were enrolled in 8 Italian hospitals. Patients were randomized into either the LT group or the sham group. Operator A graded OM and pain. LT (970 nm, 5W 50%, 35–600 Hz, 230 seconds) or sham therapy were performed twice a day for four consecutive days (days 0–3) by Operator A. On days +3, +7 and +11 blinded Operator B evaluated OM grade, distribution/dimension of lesions and pain.

**Results:** 51 patients were randomized into the LT group and 50 in the sham group according to WHO grade. 93.7% of LT patients and 72% of sham patients had a WHO<2 on Day +7 (P = 0.01).

Significant (P < 0.006) decreasing of NRS was registered between day 0 (NRS: 8 [7–9] in both groups) and day 7 (NRS: 1 [0–3] in the LT group and 2.5 [1–5] in the sham group). The LT group showed reduced dimension and number of lesions if compared to the sham group.

A reduced use of analgesics was reported in LT group (49%) if compared to sham group (62%) although still half of the patients was taking analgesics on day 7.

Neutrophil count was not significantly different between groups over time (NS).

**Conclusions:** LT is safe and effective and should be introduced as standard therapy for paediatrics affected by OM. Innovative parameters allow reduced energy dispersion and treatment time.

**Relevance:** LT improves OM, limiting pain and analgesics' assumption. This is linked to improved feeding capacity, reduced parenteral nutrition and eventually hospitalization.

**B025****Bleeding risk after oral surgery in new oral anticoagulants therapy**

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**Objectives:** To assess the risk of bleeding complications after minor oral surgical procedures in patients taking new oral anticoagulants (NOAC).

**Methods:** A multi-centre prospective observational study included 32 minor oral surgical procedures in 24 patients. Data were collected in a dedicated form and all patients were visited 7 days after surgery or before if needed.

**Results:** The mean age of the patients (17 males and 7 females) was 76.1 years; none of the patients smoked and 5 were diabetics (type 2). The recorded NOAC were dabigatran (9 subjects), rivaroxaban (7), apixaban (6) and ximelagatran (2). Thirty-two surgical procedures (45 tooth, 27 root extractions and 1 periodontal surgery) were performed: 15 without drug holiday and 17 after 24 hrs perioperative discontinuation as requested by the general medical practitioner/cardiologist. All cases had sutures while antibiotic therapy was prescribed in 23 patients. Eleven (34%) bleeding events were recorded. Nine slight bleeding occurred on average 2.5 days after surgery and were controlled by local compression; 2 moderate bleeding (at day 3 and 4) requiring re-suturing. All these 11 procedures (range 1–6 roots/teeth extractions) were performed in 24 hrs drug holiday (5 apixaban, 5 rivaroxaban, 1 dabigatran). The major events occurred in one patient treated with apixaban and in one with rivaroxaban; they both underwent 4 extractions (2 adjacent teeth in 2 different quadrants) in the same session (simple in the first patient, complex in the second one). No alveolitis or hematoma were observed, but one hypertrophic blood clotting appeared 7 days after surgery.

**Conclusions:** A 24 hrs drug holiday appears not to be able to completely avoid bleeding events after minor oral surgery in patients taking NOAC, nevertheless most of events are easily manageable without the need to refer to the dentist.

**Relevance:** NOAC are an emerging therapy. Current recommendations for minor oral surgery are often based on expert opinion: more data will be helpful.

**B026****Intraepithelial CD8 (+) lymphocyte infiltration as a predictive biomarker of oral lichen planus**

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Oral lichen planus is a chronic inflammatory disease caused by cytotoxicity of CD8 (+) cytotoxic lymphocytes (CTL) against mucosal epithelium, and subepithelial "band-like" lymphocyte infiltration is known as a diagnostic clue of this disease. However, because cytotoxic reaction occurs in the epithelium, evaluation of intraepithelial lymphocyte infiltration might make an elucidation of this lesion.

We performed phenotype examination of intraepithelial lymphocytes by immunohistochemistry on 123 cases of oral lichen planus.

High frequency of CD8 (+) CTL in the epithelium is associated with high remission rate of the disease, while CD4 (+) lymphocytes is not predictive for the clinical behavior. CD8 (+) CTL is predictive in the subgroup with high Tbet/ FoxP3 ratio among CD4 (+) lymphocytes, or low frequency of CD279 (PD-1) positive cell infiltration, suggesting the high avidity of CD8 (+) CTL reaction is related with remission.

We propose "intraepithelial" CD8 (+) CTL as a good predictive biomarker of oral lichen planus.

**B027****Patient reported outcome measures for oral lichen planus**

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**Objectives:** Evaluate patient reported outcome measures (PROM) in oral lichen planus (OLP) patients. Specific aims: (i) assess PROM response to OLP treatment, (ii) compare the PROM outcomes to objective measures, and (iii) survey the clinicians regarding impact of the PROM on clinical practice.

**Methods:** Patients were evaluated at baseline and a followup visit. Measures include: standard of care treatment, Oral Mucosal Disease Severity Score (ODSC), Chronic Oral Mucosal Diseases Questionnaire (COMDQ) completed by the patient, and a clinician questionnaire regarding the use of PROM in clinical practice.

**Results:** We enrolled 42 patients (83% female; mean age ± SD = 66.1 ± 9.9) with symptomatic OLP from 3 Oral Medicine practices in Charlotte (n = 23); Zagreb (n = 13)

and Cork (n = 6) and 10 clinicians. 40(95%) patients were managed with topical steroids; 6(14%) with systemic steroids; 5(12%) with a combination of topical/systemic steroids and one lost to followup. The ODSC and COMDQ domains of pain and functional limitation, and social and emotional parameters significantly improved from baseline to followup ( $P < 0.001$ ). There were no statistical differences in medication and treatment scores ( $P = 0.11$ ) and patient support scores ( $P = 0.49$ ). The ODSC correlated well with the COMDQ domains ( $r = 0.75$ ,  $P = 0.01$ ). Clinicians reported that the PROM results had at least a moderate positive impact on recommendations for oral hygiene (41.5%); treatment (51%); support/reassurances to patients (54%) and an overall impact for patient care (51.2%). Additionally, 56.1% of clinicians thought that there were too many questions on the PROM, with 22% reporting at least a moderate negative impact on the flow/timing of an oral medicine practice.

**Conclusion:** There was an improvement of ODSC and certain COMDQ domains with treatment of OLP. Clinicians noted results of the COMDQ have a positive impact on patient care.

**Relevance:** PROMs provide important data to improve management approaches based on a patient's perspective.

## B028

### Melatonin supplementation in patients with Burning Mouth

#### Syndrome: preliminary results

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**Objectives:** To evaluate the efficacy of melatonin supplementation in the treatment of Burning Mouth Syndrome (BMS).

**Methods:** A double blind, placebo-controlled, crossover, randomized clinical trial was performed. Twenty patients (16 women and 4 men) affected by BMS were enrolled, following a pragmatic approach. They were randomly divided in two groups, group 1 received 3 mg of melatonin, in the form of compresses, four times/day for 8 weeks and then, after a 4 weeks of wash-out period, a placebo in the same form, four times/day for 8 weeks; group 2 vice versa. Before and after treatment, as primary outcome, pain was measured by Verbal pain intensity score and Visual Analogue Scale (VAS). Anxiety and quality of sleep as well side effects were also recorded. Blood samples were collected and serum melatonin was measured by liquid chromatography coupled to mass spectrometry. Intention-to-treat statistical analysis was applied.

**Results:** Eight patients out of the original group of twenty (40%) dropped out, equally distributed between arms. No statistically significant difference was recorded comparing verbal pain intensity score and  $\Delta$ VAS scores (=baseline - end of treatment). Anxiety and quality of sleep showed similar profiles during the trial. Blood melatonin concentrations, at baseline, were in all cases below  $5 \text{ pg ml}^{-1}$ ; after the active treatment, melatonin increased to  $1520 \pm 646 \text{ pg ml}^{-1}$ , while remained to lower, physiological levels after the treatment with placebo ( $26 \pm 16 \text{ pg ml}^{-1}$ ). Side effects were equally distributed between arms.

**Conclusions:** Within the limitations of this study, melatonin did not show superior efficacy on pain among BMS patients compared with the placebo.

**Relevance:** Although recent evidence suggests an association between sleep disorders and BMS, the current study failed to support the use of melatonin for treating BMS. A crossover design appears not ideal for assessing BMS therapy efficacy; a nocebo effect could be supposed.

## B029

### Dietary patterns, physical activity and risk factors for cardiovascular diseases in a large dental population: a multicenter study

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**Background:** The AHA 2020 strategic goals highlighted the need to improve lifestyle habits to prevent cardiovascular diseases (CVDs). Health care providers, including dentists, have the opportunity to counsel their patients on good lifestyle habits. The aim of this multicenter study was to identify dietary and physical activity patterns and potential risk factors for CVDs in a large dental population.

**Methods:** 2,200 questionnaires were sent out to four Italian dental hospitals. The questionnaire queried on demographic information, past medical history, tobacco smoking and alcohol consumption. Physical activity and dietary habits were assessed using the modified physical activity and food NHANES questionnaire. BMI was used to define obesity status. Differences between gender and age groups were assessed using independent t-tests for continuous data and chi-squared tests for categorical data.

**Results:** 1,201 patients completed the questionnaire (61.2% females). Sixty-five percent of the individuals were consuming alcoholic beverages daily (86.1% having 1–5 drinks week<sup>-1</sup>) and 36.1% were current smokers with 56.4% smoking between 16–20 cigarettes/day. Patients reported that 47.5% of their dentists counseled them to quit smoking. Ninety percent of the patients had red meat at least 2–3 times week<sup>-1</sup>. Fish consumption was reported by 50.3% of the patients once a week and by 35.4% 2–3 times week<sup>-1</sup>. Daily consumption of at least one portion of fruit and of vegetables was reported by 56.8% of patients, with higher daily consumption in women and younger individuals (<50 years old;  $P < 0.05$ ). Forty three percent of the individuals were engaged in moderate physical activity (mean activity count: 143 min week<sup>-1</sup>) and 30% of patients were engaged in vigorous physical activity (mean: 162 min week<sup>-1</sup>). Vigorous physical activity was more frequent in younger individuals (<50 years old;  $P < 0.01$ ). Fifty eight percent of the patients reported watching TV or staying in front of a computer at least  $\geq 2$  hrs a day (10.7% being > 5 hrs day<sup>-1</sup>). The proportion of patients classified as overweight (BMI [25–29.99 kg m<sup>-2</sup>]) and obese (BMI>30 kg m<sup>-2</sup>) was 13.3% and 1.8%, respectively. Cardiovascular diseases were more frequent among smokers and patients who did not practice any daily physical activity ( $P < 0.001$ ).

**Conclusions:** Dietary and physical activity habits of Italian dental patients remain poor, especially among older individuals. Promotion of physical activity and access to healthy foods for the patients may reduce the burden of CVDs. Additional communication between patients and dentists could increase CVDs knowledge and potentially motivate patients towards improved well-being.

## B030

### The efficacy of hyaluronic acid gel in recurrent aphthous stomatitis

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This study was conducted to evaluate the efficacy of topical hyaluronic acid gel (HA) compared with triamcinolone acetonide pomade (TA) in the treatment and pain control of RAS. A total of 57 patients (mean age =  $37.12 \pm 11.3$ ; range = 18–60, female = 29, male = 28) with a history of RAS and currently suffering from oral ulcers were selected from patients referred to clinic. The subjects were randomly divided into two groups; one group have received TA pomade, (Kenacort-A Orabase® Pomade, 0.1% Triamcinolone acetonide, Bristol-Myers Squibb İlaçları Inc. Istanbul, Turkey) and the other received HA gel (Aftamed® Oral gel, AktiFarma. Istanbul, Turkey). All patients were instructed to apply the agents to the ulcer 4 times per day for 7 days (day 0 to day 6). To evaluate pain level, a visual analogue scale (VAS) consisting of a 10-cm horizontal line between the poles of "no pain (0)" to "unbearable pain (10)" was used.

Statistically significant differences were not detected among the demographics and ulcer histories including age, gender, disease time, mean healing time, family RAS history and ulcer localization between two groups ( $P > 0.05$ ). Although there was no statistical difference between two groups by means of mean ulcer VAS scores ( $8.59 \pm 1.08$  in TA group and  $8.57 \pm 1.05$  in HA group) at day 0, significant differences were found at day 4 (VAS score =  $5.82 \pm 1.07$  in TA group and  $4.88 \pm 0.83$  in HA group) and day 7 (VAS score =  $3.07 \pm 0.97$  in TA group and  $2.30 \pm 0.90$  in HA group). The ulcer pain scores (VAS) of two groups decreased with time however, the pain score in HA group was statistically lower than that of the TA groups at day 4 and 7 ( $P < 0.05$ ). HA gel reduced the painful symptoms of RAS when compared with TA pomade. These outcomes suggest that HA gel can be effectively used for pain control in RAS treatment.

## B031

### Self-rated and measured taste perception in oral lichen planus patients

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**Objectives:** Evaluation of self-rated and measured taste function in patients with oral lichen planus (OLP) with lesions on the dorsum of the tongue and association to subjective pain perception.

**Material and methods:** The test group included clinically and histopathologically diagnosed, but untreated OLP patients with lesions on the dorsum of the tongue (n = 20). The control group was matched for age and gender, had a clinically healthy mucosa and no systemic disease or medications affecting taste function (n = 20). Patients' intraoral pain and subjective perception of taste were recorded on a visual analogue scale. Taste function was assessed by means of a validated test with taste strips.

**Results:** Measured taste function was lower in patients affected by tongue lesions due to OLP ( $P = 0.01$ ). The taste quality "sour" was most decreased compared to controls

( $P = 0.01$ ). The other taste qualities (“sweet”:  $P = 0.11$ ; “bitter”:  $P = 0.28$ ; “salty”:  $P = 0.25$ ) were less concerned. Subjective taste perception differed from objective measurements and no difference was found between the groups. No correlation was found between pain sensation and subjective / objective taste perception.

**Conclusion:** Untreated OLP subjects with involvement of the tongue have lower gustatory function than healthy subjects. Subjective awareness differs from measured taste sensation.

**Relevance:** Patients with OLP and tongue lesions have impaired gustatory function what may affect their quality of life. Further studies on larger samples of OLP patients are requested to confirm the findings.

### B032

#### Burning mouth syndrome: possible dental hypersensitivity problem

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**Objectives:** According to the definition of the International Association for the Study of Pain (IASP): Burning Mouth Syndrome (BMS) is “a distinctive nosological entity characterized by unremitting oral burning or similar pain in the absence of detectable mucosal changes”. In addition, burning and pain are often accompanied by subjective xerostomia, oral paresthesia and altered taste or smell.

BMS affects mostly middle aged or elderly (50–70 years of age) women, as they are 3–7 times more likely than men of a similar age to experience the symptoms. The condition may be idiopathic or linked to various medical and dental disorders.

So, our purpose is to present the age and gender distribution in a sample of Bulgarian patients with BMS and the prevalence of sensitization to dental materials amongst them.

**Methods:** Patients with BMS, were sent for oral diagnostics, and their medical history logged, concerning symptoms and localization of the problem, and presence of xerostomia. Materials, available in mouth, were registered. Galvanic current is measured (in cases with metal restorations) and patch test with standardized allergens is accomplished, as the results are read on the 72nd h.

**Results:** The studied group is with mean age of  $61.26 \pm 12.52$  years and the age distribution is normal. Females prevail significantly. Most of the patients have metal restorations (precious and non-precious alloys, dental amalgam), and almost half of them – acrylic ones. One third of patients have increased levels of the galvanic current, and 28.6% have one or more positive reactions to dental allergens.

**Conclusions:** BMS is a condition with multifactorial origin. Although hypersensitivity to dental materials is with low prevalence in this group of patients, patch test should not be skipped over.

**Relevance:** Every appropriate diagnostic approach, including allergy tests, should be applied in studying BMS.

### B033

#### Implant survival and peri-implant diseases in liver transplant recipients

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**Objectives:** The objective of this prospective controlled study was to evaluate the long-term survival rate of implants and presence of inflammatory changes around implants in a cohort of liver transplant recipients receiving immunosuppressive drugs.

**Methods:** Two groups, including 14 liver transplant patients (LTG), and 16 controls (CG), received 48 and 53 Nobel Biocare implants between the years 2000 to 2009. Final examination was carried out after a mean follow-up of 111.5 months. Fixed screw-retained prostheses were used in all cases, and strong maintenance program. Chlorhexidine mouthrinses (Perio-Aid®) were maintained in all patients. Final clinical assessment included probing depth (PD) and presence of bleeding on probing. Bone loss was measured in relation to the threads of implants with peri-apical radiographs with a long-cone parallelization technique and digital images were analyzed using the Digora® system. Presence of peri-implant mucositis (PIM) and peri-implantitis (PI) were evaluated according to Roos-Jansäker et al. (2006).

**Results:** No implant in LTG was lost during the follow-up, and implant survival rate was 100%. Implant survival rate in CG was 93.75%. Almost all the items showed statistically significant differences between previous and posterior OHIP-14 in both groups. In LTG, PIM appeared in 11 patients (78.6%) and in 20 implants (41.7%). PI appeared only in one patient (7.1%) and in 2 implants (4.1%). In CG, PIM appeared in 10 patients (62.5%) and in 24 implants (45.3%). PI appeared in 3 patients (18.8%) and in 5 implants (9.4%).

**Conclusions:** Despite the limitations of a small sample size, it seems an evident improvement of quality of life, measured after implant treatment in immunosuppressed liver transplant patients; therefore, it is a successful treatment.

**Relevance:** This is the first prospective study that measures implant survival and peri-implant diseases in immunosuppressed liver transplant recipients.

### B034

#### An Oral Disease Severity Score (ODSS) validated for *Pemphigus vulgaris*

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**Objectives:** The aim of this study was to validate an ODSS for the assessment of oral involvement in Pemphigus vulgaris (PV). We compared the methodology with the oral aspects of two previously validated methodologies for PV and the physicians's global assessment score.

**Methods:** 15 patients (f11:m4 mean age 56 (SD  $\pm$  14.17) range 23–77 years) with active oral PV were scored by 10 oral medicine clinicians using the ODSS, the oral sections of the Autoimmune Bullous Skin Disorder Intensity Score (ABSIS), the Pemphigus Disease Activity Index (PDAI) and a Physician's Global Assessment (PGA). Two clinicians then re-scored all patients after a minimum 2-hrs interval. Twelve scores were recorded for each patient. Patients additionally completed the Treatment of Autoimmune Bullous Disease Quality of Life Questionnaire (TABQoL).

**Results:** The mean total ODSS score was 22.3 (SD  $\pm$  12.8), range 3–33 with a mean completion time of 76 (SD  $\pm$  37) seconds. The intra-class correlation coefficient (ICC) for inter-rater reliability of the ODSS total was 0.83 (0.71–0.94), PDAI 0.79 activity (0.65–0.92), ABSIS total 0.71 (0.55–0.88) and PGA was 0.7 (0.54–0.87). Intra-observer agreement between initial scoring and re-scoring of the same subject demonstrated an ICC of 0.97 (0.96–0.97) for ODSS total, 0.91 (0.82–0.99) PDAI activity, 0.59 (0.45–0.72) ABSIS total and 0.82 (0.64–0.99) PGA. The mean TABQoL score was 14.6 (SD  $\pm$  7.7).

**Conclusions:** This study demonstrates the validity of the Oral Disease Severity Score for the assessment of oral PV. It compares very favourably with recently validated methodologies for scoring PV. Furthermore it allows assessment of the severity at seventeen oral sites facilitating more accurate serial monitoring.

**Relevance:** The validated Oral Disease Severity Score is quick and easy to use. It is particularly useful for all oral medicine physicians who treat patients with oral PV. It will additionally be a useful research tool for disease assessment when conducting large multi-centre studies.

### B035

#### Protocol of oral health diagnostics of patients with forthcoming liver transplantation

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**Introduction:** In recent years there has been an increase in the number of patients who have significant liver disease or having undergone liver transplant therapy. There had been a number of liver transplantations in Bulgaria during the last 5 years. All patients with performed or expecting liver transplantation, should be examined thoroughly for active or potentially active foci of infection, which at a certain stage could compromise the intervention.

**Aim:** The aim of our study is to access the oral health of patients awaiting liver transplantation and creating of a diagnostic protocol for examination and evaluation of oral health and dental status, regarding their general health.

**Materials and methods:** Based on the literature data we decided to perform different clinical and paraclinical tests, according to our aim: panoramic X-ray in combination with sectoral x-ray, thermography and test of Gehlen (for detection of dental foci) electric-pulp test, full blood count with differential, INR, prothrombin time (for assessment of coagulation status), CRP(as acute phase protein), AST, ALT, GGT (for assessment of liver function), urine strip tests with 10 parameters – examined in whole saliva (Laboquick 10 parameter – asc, glu, pH, leukocytes, nit, uro, pro, pH, sg, ket).

**Results:** We diagnosed active dental foci in 41 patients. 35 have parodontal diseases; 34 teeth have periapical lesions, which can't be treated endodontically, and are subject to extraction. Oral lesions were present in 19 patients. All extractions were performed in hospital conditions. All invasive dental procedures were done under antibiotic protection.

**Conclusion:** Considering the fact, that there are no currently available protocol for diagnostics of patients awaiting liver transplantation in Bulgaria, in collaboration with Department of hepato-pancreatic surgery and transplantology of Military hospital and Faculty of dental medicine we proposed a specific protocol for pretransplant oral evaluation.



**B036****Oral pathology prevalence in a Portuguese population of 9,595 subjects**I Cardoso<sup>1</sup>, AC Pinto<sup>1</sup>, I Henriques<sup>2</sup>, P Trancoso<sup>1</sup>, A Azul<sup>1</sup><sup>1</sup>*Clinica Integrada de Medicina Oral, Lisboa, Portugal, <sup>2</sup>Universidad Santiago de Compostela, Spain*

Epidemiological studies are indispensable in the generation of etiological hypothesis and providing the frequency and/or patterns of disease occurrence at the societal level.

The goal of this study was to evaluate the prevalence of oral lesions in a Portuguese population of patients from a general dental clinic in Lisbon.

Retrospective, observational, transversal and comparative study, by analysis of 9,595 patient records. Pathologies will be presented by age and gender. Standard statistical parametric methods (ANOVA and Tukey-Kramer) were applied ( $P < 0.05$ ).

We identified 1,698 oral lesions in the 9,595 subjects (17.7%) (fem = 66.1%, male = 33.9%;  $p < 0.05$ ). Burning mouth syndrome (BMS - stomatodynia) being the most frequent (18.4%) followed by lichen planus (15.5%), benign tumors (9.3.7%), intraosseous/odontogenic cysts (6.1%), *Candida* spp infections (5.1%), geographic tongue (4.4%), traumatic ulcers (4.3%), frictional keratosis (4.1%), salivary retention cysts (4.1%), recurrent aphthae (3.7%), oral cancer (2.1%), reactive granuloma (1.9%), and leukoplakia (1.8%).

These results will be compared and discussed with international studies because of the significant differences among several countries.

The results of this study with a Portuguese population of patients suggest the existence of multiple pathologies, in particular a group of potentially malignant/cancer lesions and BMS (both with almost 1 in each 5 lesions – 3.4% of the total population) which must be diagnosed at routine dental consultations. They also show the pressing need of objective and consensual criteria among international community.

Most part of those oral lesions identified in our study have a diagnostic set-up and a medical/surgical treatment not much complex for a general dental practitioner, if pre-graduate teaching and CEC focus in a systematic way the most prevalent and relevant lesions of the oral cavity.

**B037****The scope of carbon dioxide laser (CO<sub>2</sub> laser) applications in the management of oral soft tissue lesions**

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**Introduction:** The use of laser in the management of oral soft tissue lesions is a growing modality in the world of new innovation. The use of the conventional method has been the golden standard tool in the diagnosis and treatment of various oral pathologies. Laser technology in the recent years has added a great value in the management of different oral mucosal lesions in terms of the less post-operative complications, pain management, reduction of bacterial pathogens, and wound healing. Studies have shown its advantages over the conventional methods. Carbon dioxide laser (CO<sub>2</sub> laser) has been recommended to treat benign oral lesions as well as premalignant lesions.

The presentation will outline the below clinical cases, which were treated with CO<sub>2</sub> (10600 nm) laser. Also, it will highlight the advantages of the laser therapy especially in the management of medically compromised patients.

Case 1: Excision of gingival hyperplasia (Denture induced hyperplasia) in the region of the LL5-LR5 and in the palate in medically compromised patient. 74 years old caucasian female presented with two lesions; the first lesion was extending from the LL5-LR5 region & the second lesion was at the junction between the hard and soft palate.

Case 2: Excision of gingival hyperplasia on the palatal aspect of UR1--UL1 in paediatric patient. Twelve years old was referred by his general dental practitioner (GDP) regarding a lesion of the gingivae of the interdental papillae between UR1 and UL1. The lesion was symptomatic, tended to bleed on brushing. It has been there for 4 weeks. It started as a small lump but increased in size over a period of time.

Case 3: Excision of extensive lesion (Haemangioma) in the region of the lower right first molar region. Thirty year old male presented with an extensive lesion in the region of the LR6. Tended to bleed by gentle touch. The patient is fit and healthy.

**Conclusion:** CO<sub>2</sub> laser applications in the management of oral mucosal lesions play a crucial role in improving patients' quality of life and their experiences. However, further randomized-control trial studies, double-blind/placebo-controlled studies long-term follow up are required to provide more evidence-based practice in the management of various oral pathologies.

**B038****Oral VSC levels in patients with BMS and self-perceived halitosis**

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**Objectives:** To our knowledge this was the first study which examined volatile sulfur compound (VSC) levels of burning mouth syndrome (BMS) patients and compared with those of self-perceived halitosis. We also investigated the correlations among the VSC levels, halitosis, and its related factors.

**Methods:** A total of 62 patients (38 female and 24 male) with oral discomfort were recruited. Their chief complaints were divided into three distinct categories: BMS, self-perceived halitosis, and stomatitis. The structured questionnaires were given to evaluate the self-perception of halitosis and BMS. A halitosis diagnosis was made using a newly developed portable chromatograph (Twin Breasor IITM, Isenlab, Seoul, Korea) which has the specificity for hydrogen sulfide (H<sub>2</sub>S) and methyl mercaptan (CH<sub>3</sub>SH).

**Results:** The incidence of genuine halitosis based on VSC values was significantly higher in self-perceived halitosis patients than those with BMS or stomatitis ( $P < 0.001$ , each). Patients with self-perceived halitosis had significantly higher H<sub>2</sub>S levels than did BMS patients ( $P < 0.05$ ), but this difference was not shown in CH<sub>3</sub>SH. We found a strong positive correlation among the CH<sub>3</sub>SH levels and the presence of hyperlipidemia and the number of medications only in BMS patients ( $P = 0.001$  and  $P < 0.001$ , respectively). However, there was no significant correlation between the presence of xerostomia and the H<sub>2</sub>S and CH<sub>3</sub>SH levels in all categories. In addition, gender, tongue coating index, xerostomia, calculus deposition, and presence and the number of periapical abscess, caries, and prosthetic teeth were not significantly related to VSC values in all categories.

**Conclusions:** In BMS patients, increased number of medications and the presence of hyperlipidemia could be related factors on halitosis. Further researches should be needed to elucidate the relationships among the H<sub>2</sub>S and CH<sub>3</sub>SH levels, and known major factors which cause halitosis in BMS and periodontally healthy patients.

**B039****Signalling pathways in recurrent aphthous stomatitis – a family-based association approach**M Bankvall<sup>1</sup>, S Östman<sup>2</sup>, M Jontell<sup>1</sup>, Å Torinsson Nalua<sup>3</sup><sup>1</sup>*Department of Oral Medicine & Pathology, Institute of Odontology, <sup>2</sup>Department of Infectious Diseases, Institute of Biomedicine, <sup>3</sup>Department of Microbiology and Immunology, Institute of Biomedicine, at the Sahlgrenska Academy, University of Gothenburg, Sweden*

**Objectives:** The aetiology behind recurrent aphthous stomatitis (RAS) remains unknown. Individuals prone to this condition may share common features of genetic susceptibility. In addition, an hereditary component has been suggested.

The aim was to identify signalling pathways in RAS using a family-based genome-wide association approach.

**Methods:** Buccal swabs were obtained from 16 families. Sixty-six individuals were considered cases since they had suffered from RAS in the past or at present and 25 individuals as controls, having never suffered from this condition.

DNA extraction was performed using the beadex® Forensic Kit for the preparation of nucleic acids (LGC Ltd, Middlesex, UK) before conducting an Illumina core exome SNP microarray. dFAM, implemented in PLINK, was used to generate SNP association values across all chromosomes. dFAM incorporates TDT, sibling TDT and allelic test for unrelated cases and controls in a single Cochran-Mantel-Haenszel test per each marker. The top 1000 SNP associations were selected for pathway analysis. Pathways were obtained from the KEGG database.

**Results:** The following pathways were identified with a P-value.

**Conclusions:** The Ras pathway affects several cellular functions and is thought to activate a number of other pathways for example the PI3K-Akt and Rap1 pathways as well as the T-cell receptor pathway. This strengthens previous reports of RAS being caused by a dysregulation in the T cell immune response. The results also confirm that this condition is not monogenic but most likely a result of interactions between multiple host genes and environmental factors. Combined these factors result in similar clinical characteristics identified as recurrent ulcerations.

**Relevance:** The present approach allows further penetrating unknown immunological mechanisms behind RAS, generating new insights and hypotheses. It also provides future possibility of identifying individuals at risk of acquiring this condition.

**B040****Non-invasive diagnostic aids for oral cancer and epithelial dysplasia**S Porter<sup>1</sup>, V Mercadante<sup>1</sup>, G Lodi<sup>2</sup>, S Fedele<sup>1</sup>, A Petrie<sup>1</sup>, A Ukwas<sup>1</sup><sup>1</sup>Department of Oral Medicine, UCL Eastman Dental Institute London, UK, <sup>2</sup>Department of Biomedical, Surgical and Dental Sciences, University of Milan, Italy

**Objectives:** The main objective of this systematic review and meta-analysis were to estimate the diagnostic accuracy of available non-invasive tests for oral squamous cell carcinoma and oral epithelial dysplasia. We also aimed to assess the quality of reporting of relevant diagnostic accuracy studies.

**Methods:** Electronic searches were performed in MEDLINE, Embase. Two reviewers independently rated the methodological quality of each eligible study using the Quality Assessment of Diagnostic Accuracy Studies (QUADAS-2). Quality of reporting was assessed using the Standards for the Reporting of Diagnostic accuracy studies (STARD).

**Results:** The meta-analysis included seventeen studies with nineteen data sets, which evaluated the diagnostic accuracy of vital staining (8 studies), autofluorescence (7), and chemiluminescence (4). The estimated sensitivity for vital staining was 0.88 (95% CI 0.78–0.94) with specificity of 0.71 (95% CI 0.64–0.78). For autofluorescence the sensitivity was 0.86 (95% CI 0.50–0.97) and specificity 0.38 (95% CI 0.14–0.70). With regards to the chemiluminescence the sensitivity was 0.71

(95% CI 0.58–0.81) with a specificity of 0.57 (95% CI 0.33–0.79). Only one study had a low risk of bias in all QUADAS-2 categories and no study adhered to the STARD statement for reporting studies of diagnostic accuracy.

**Conclusions:** This systematic review has demonstrated that, given the methodological flaws and reporting deficiencies of the included studies of diagnostic test accuracy, none of the available methods can be advocated for the early detection of oral cancer and epithelial dysplasia.

**Relevance:** The results of this study highlights the urgent need of appropriately designed, undertaken, and reported studies of diagnostic test accuracy for the early diagnosis of oral squamous cell carcinoma and oral epithelial dysplasia.

**B041****Treatment of patients affected of HSTC related mucositis with Mucosamin**T Rugeiero<sup>1</sup>, R Pol<sup>1</sup>, D Camisassa<sup>1</sup>, L Giaccone<sup>2</sup>, S Carossa<sup>1</sup><sup>1</sup>Department of Surgical Sciences, Dental School, University of Turin, Turin, Italy, <sup>2</sup>MD PhD, Department of Molecular Biotechnology and Health Science, University of Turin, Turin, Italy

**Objectives:** Oral mucositis (OM) may occur in up to 100% of patients undergoing conditioning regimen to hematopoietic stem cell transplant (HSCT). From the patient's perspective, OM is one of transplantation's most debilitating side effects. Patients' oral hygiene can modify the incidence and severity of oral mucositis, therefore professional oral health care (POHC) is recommended prior to conditioning regimen for HSCT, if there is time. A new strategy for the treatment of OM is the sodium hyaluronate (SH) combined with amino acid precursors of collagen (Aas) (Mucosamin®). SH is a mucoadherent polymer acting as a mechanical barrier and pain reliever.

**Methods:** 68 adult patients prepared for HSCT were recruited at the Stem Cell Transplant Unit, and divided into two groups. Group A was treated with POHC before HSCT and applications of Mucosamin® during the recovery after transplantation. Group B served as a control group, with the usual treatment of Chlorhexidine 0.20%. After HSCT the same clinician, evaluated symptoms of patients' mucositis of both group every day, according to OMAS and WHO scale.

**Results:** Patients in Group A developed a less severe OM, while patients who did not assume the compound developed more severe and painful lesions; this result is statistically significant ( $P = 0.02^*$ ).

The maximum OM pain, measured with the VAS scale, was higher in patients who did not assume Mucosamin®: maximum VAS average in Group A 4.42 (DS  $\pm 2.61$ ) and in Group B 4.77 (DS  $\pm 3.33$ ). In the group A OM resolved sooner than group B: average durations in days in Group A 9 (DS  $\pm 7$ ) and in Group B 11 (DS  $\pm 16$ ).

**Conclusion:** The Mucosamin® seems to have a protective role against the more severe phases of mucositis. When Mucosamin® and POHC are associated, the risk of developing higher grades of mucositis is strongly reduced. This spray can be a valid therapeutic aid in the treatment of mucositis.

**B042**

Abstract Withdrawn.

**B043****Impacts of chronic orofacial pain – vulnerable patients and disruptive pain**G Almozino<sup>1</sup>, A Zini<sup>2</sup>, Y Etzioni<sup>3</sup>, V Klitnich<sup>1</sup>, Y Sharav<sup>1</sup>, R Benoliel<sup>4</sup>, Y Haviv<sup>1</sup><sup>1</sup>Department of Oral Medicine, Hebrew University-Hadassah School of Dental Medicine, Jerusalem, Israel, <sup>2</sup>Department of Community Dentistry, Hebrew University-Hadassah School of Dental Medicine, Jerusalem, Israel, <sup>3</sup>In Partial Fulfillment of DMD degree, Hebrew University-Hadassah School of Dental Medicine, Jerusalem, Israel, <sup>4</sup>Rutgers School of Dental Medicine, Rutgers, The State University of New Jersey, Newark, NJ, USA

**Objectives:** To identify patient and pain characteristics that predict poor outcome in terms of impact on daily life among chronic orofacial pain (COFP) patients.

**Methods:** This cross-sectional study analyzed medical records of COFP patients over a 2-year period. Collected data included: demographics, health and psychiatric backgrounds, trauma history, number of medical professionals seen, days of absence from work and self-assessed pain, sleep and quality of life (QoL) on a 0-10 visual analog scale.

**Results:** 199 patients were included, with a mean age of  $50.8 \pm 70.9$  years. Diagnostic categories included: Temporomandibular disorders (85; 42.7%), headaches (47; 23.6%), atypical regional neuropathic pains (37; 18.5%), Trigeminal Neuralgia (16; 8.0%) and Painful Post Traumatic Trigeminal Neuropathy (PTTN) (14; 7.0%).

Of these, 47 (23.7%) had medical and 13 (6.5%) psychiatric co-morbidities, 49 (24.6%) reported micro-trauma and 22 (11.1%) macro-trauma. Seven (5%) had stopped working and mean days of absence from work was  $3.3 \pm 19.3$ . Patients were treated by  $2.7 \pm 1.4$  caregivers previously. Mean VAS scores were: pain ( $7.13 \pm 2.3$ ), sleep quality ( $6.6 \pm 2.4$ ), QoL ( $5.58 \pm 3.1$ ). PTTN patients were more likely to quit work (27.3%;  $P = 0.009$ ) and exhibited more days of absence from work (mean: 24.3;  $P = 0.009$ ).

We identified specific patient and pain profiles that predict poor outcome in terms of impact on daily life. The "vulnerable patient" profile includes health and psychiatric co-morbidities and trauma history, particularly in PTTN. The "disruptive pain" profile had specific pain characteristics, such as severe, continuous, burning, electrical quality pain accompanied by systemic signs. The parameters of these profiles intersect in a complex manner, creating a viscous cycle.

**Conclusions:** Normal daily activities are considerably impaired in COFP patients, and specific patient and pain profiles predict this poor outcome. A multidisciplinary team approach is recommended to manage these complex patients, including interventions to improve treatment outcome and avert more serious consequences.

**B044****Evaluation of diagnostic accuracy of salivary biomarkers for oral cancer**

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**Objective:** To evaluate the accuracy of using single /combination of omic-based biomarkers eg. genomics, proteomics, transcriptomics, metabolomics as diagnostic salivary biomarkers in the screening for oral cancer.

**Method:** Studies were gathered through PubMed and Web of Knowledge with keywords: oral cancer, oral squamous cell carcinoma, AND sensitivity, specificity, accuracy, meta-analysis. Data were coded according to biomarker and combinations of biomarkers with respect to key accuracy metrics. Accuracy of the biomarkers to the presence of oral cancer were ranked by positive likelihood ratios, which are more stable and informative than sensitivity and specificity - metrics that are biased by prevalence.

**Results:** The shotgun use of biomarkers neither increased accuracy as measured by positive predictive value/PPV, nor did random shotgun approach reduce uncertainty. The two methods for interpreting shotgun PPVs are

1. Simple addition of PPVs to achieve a total probability of a correct finding of cancer, and 2. The multiplication product of PPVs to arrive at a probability of the incorrect presence of cancer. Both methods are inefficient and deceptive as they require independence from one another. However, they are not independent because all tests of the same patient will share the same underlying disease state.

**Conclusions:** The best method for determining which biomarker to use (single/in combination) requires biomarkers be treated as signals conditional upon one another as a principle in clinical epidemiology. First though, biomarker accuracies must be adjusted for artificially high prevalence levels in case control discovery. Second, biomarkers must be read as conditional probabilities and in the order of decreasing information value. This method required the fewest biomarkers to approach zero uncertainty.

**Relevance:** This method eliminates the common biases that pervade biomarker research literature and can be applied to studies of biomarkers intended for use in disease diagnosis, screening or prognosis.

**B045****Use of raman spectroscopy for the identification of oral dysplasia**

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The current methods used in the diagnosis of oral premalignant and malignant lesions have their limitations. The standard method which is a conventional oral exam and histopathology is limited by inter and intra observer errors in addition to sampling errors. Moreover dysplasia or oral squamous cell carcinoma (SCC) may develop in an area of normal looking mucosa. Adjuncts such as oral brush biopsy and toluidine blue staining also have their limitations as they may produce false negative results and there is no information as to whether they can predict the probability of malignant transformation. This demonstrates the need for new techniques for screening and diagnosis. Raman spectroscopy is based on the inelastic scattering of light upon its interaction with the molecules of a sample, where each Raman peak corresponds to certain vibrations in molecular bonds. It is an objective technique which gives both quantitative and qualitative information on the sample. The aim of this study was to use Raman spectroscopy to discriminate between normal, mild, moderate and severe dysplasia and oral SCC in formalin fixed paraffin preserved (FFPP) tissues. 10µm FFPP tissue sections were taken from biopsies of 35 patients who were diagnosed with various degrees of dysplasia and/or oral SCC and placed on glass slides. A novel method to digitally remove the glass substrate and paraffin wax background was developed.

Principal component analysis, linear discriminant analysis (PCA-LDA) were performed using a leave one out cross validation. Results showed that Raman spectroscopy could differentiate between normal, mild, moderate and severe dysplasia and SCC with a sensitivity and specificity that exceeds that of current diagnostic methods. Proteins and nucleic acids being the main discriminating features. These results show that with minimal tissue processing Raman spectroscopy could be used as an aid to the histopathological diagnosis of FFPP tissues in patients with different oral pathologies.

**B046****Tacrolimus and Triamcinolone acetonide in OLP: a placebo-controlled RCT**

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**Objectives:** Symptoms and clinical lesions fluctuate in oral lichen planus (OLP). Surprisingly few placebo-controlled randomized controlled trials (RCTs) have been conducted in OLP, and none with tacrolimus. Our aim was to carry out a double-blind placebo-controlled RCT with topical tacrolimus and triamcinolone acetonide in symptomatic OLP.

**Methods:** A clinical score (CS) was developed to measure the clinical signs and symptoms of OLP. Twenty-seven patients with symptomatic OLP and CS of  $\geq 20$  were randomly allocated to receive 0.1% tacrolimus ointment (n = 11), 0.1% triamcinolone acetonide paste (n = 7) or Orabase paste (n = 9), applied on the oral mucosa 3 times a day for 3 weeks. If the CS dropped a minimum of 20% (interpreted as response), the patients continued the same medication for another 3 weeks. If the CS dropped less than 20% or increased (non-response), the patients were switched to 0.1% tacrolimus for 6 weeks. The primary outcome measure was the change in the CS from baseline to week 3. The participants were blinded to the intervention during the first 6 to 9 weeks, and the investigator for the first 3–6 weeks.

**Results:** All the participants were included in the primary outcome analysis. At week 3, tacrolimus and triamcinolone groups responded to treatment more often than the placebo group (63.6% and 57.1 %, respectively vs. 11%, P = 0.004). Three cases that did not initially respond to triamcinolone, and were switched to tacrolimus, showed a decrease in CS at weeks 6 and 9.

**Conclusions:** Tacrolimus and triamcinolone acetonide were equally and more effective than placebo in reducing the CS values in OLP. Tacrolimus may be considered a second-line therapy in OLP cases that are resistant to topical corticosteroids.

**Relevance:** This pilot RCT provides evidence for the effectiveness of tacrolimus and triamcinolone acetonide over placebo in the management of OLP.

**B047****Effect of music on the pain thresholds and nervous activity**

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**Introduction:** Pain plays a crucial role in transmitting hazard signals to the body, but it causes stress. Various studies have shown that pain perception is reduced when we are concentrating on something such as sports. In this study, we examined the reduction of the pain perception by using music.

**Methods:** In the first experiment, forty-five subjects were investigated for pain thresholds on the forearm and oral area (tongue, buccal mucosa, and jaw gingiva) by using pain vision PS-2100 (Nipro) while the subjects were listening to popular music, ballads and classical music. In the second experiment, the blood oxygenation level-dependent (BOLD) signals in the cingulate cortex were analyzed using functional magnetic resonance imaging (fMRI), when eight subjects were given electrical stimulation of 80µA on their ankles while listening to music. In the third experiment, the autonomic nervous activity of ten subjects were measured using bonaly Light (GMS) while listening to popular or classical music. These data were compared with those without music.

**Results and discussion:** The thresholds of pain on all areas were significantly higher when the subjects were listening to ballads or classical music than those without music. In the fMRI study, BOLD signals were attenuated by listening to popular music (2 subjects), ballads (1 subject) and classical music (2 subjects). Listening to slow music might reduce the pain stress on all areas of the body. However, the neural activity in the cingulate cortex induced by pain may not be restrained by listening to music. Parasympathetic nervous activity values decreased significantly under listening to music compared with no music. In conclusion, the present findings suggest that listening to music is capable of reducing pain perception with the effect of autonomic nervous activity.

**B048****Clonality analysis as prognostic factor in secondary oral carcinoma**

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**Objectives:** A novel classification on the basis of the clonal analysis of the tumors and the genetically altered mucosal field distinguishes secondary oral carcinomas in: Second Primary Tumor (SPT) independent from the index tumor at the molecular level, Local Recurrence (LR), clonally related to the primary tumor, and "Second Field Tumor" (SFT), derived from the same genetically altered mucosal field as the primary tumor. mtDNA D-loop analysis was proposed as a reliable method for establishing the clonal relationship between two neoplastic manifestations. In the present study mtDNA analysis was applied in a group of consecutive patients experiencing a second loco-regional neoplastic manifestation. The purpose was to distinct secondary tumours in LRs, SPTs and SFTs and evaluate differences in terms of survival rate.

**Methods:** The study population consisted of 24 patients who experienced a second neoplastic lesion after a surgical resection of a primary OSCC. mtDNA D-loop analysis was applied in paired neoplastic lesions and respective normal mucosa to differentiate LR from SFT and SPT. Disease-free survival endpoints was defined as the duration between appearance of second neoplastic lesion and dead of disease or last follow-up visit. Results Clonal analysis of tumors and normal mucosa classified 7 of 24 secondary tumors as LR, 14 of 24 as SFT, 3 of 24 as SPT. The presence of an altered mucosal field resulted a variable significantly related with a better survival rate (P < .05); indeed 2/14 (14.3%) SFTs events failed as compared to 5/7 LRs (71.4%) and 3/3 SPTs (100%).

**Conclusion:** The presence of a clonal relationship between primary and secondary manifestations and presence of an altered mucosal field are two variables that influence the prognosis.

**Relevance:** mtDNA analysis may be considered a useful tool to give more insights and influence the choice of appropriate treatment in patients with multiple OSCCs.

**B049****Prevalence and clearance of oral HPV infection in Greek adults**A Sklavounou<sup>1</sup>, E Fora<sup>1</sup>, N Drakoulis<sup>2</sup>, E Chrysomali<sup>1</sup><sup>1</sup>Department of Oral Pathology and Medicine, Dental Faculty, University of Athens, Athens, Greece, <sup>2</sup>Faculty of Pharmacy, Pharmaceutical Technology, University of Athens, Athens, Greece

**Objectives:** The aim of the present study was to determine the prevalence of oral HPV infection in the Greek young adult population and investigate the development of persistent HPV infections among the same group.

**Methods:** The current study involved 106 university students, mainly from the Dental Faculty, aged 18–30 years old, with clinically healthy oral mucosa. Oral rinse-and-gargle samples and questionnaire data were obtained at the enrollment visit. Participants who tested positive for oral HPV DNA were asked to repeat the HPV testing at 12-month interval. Samples were initially analyzed through in-house PCR protocols and Restriction Fragment Length Polymorphism method. Positive samples were confirmed by using PCR kit and DNA microarrays.

**Results:** At the initial examination, 5.7% of students proved to be HPV positive (7.7% and 4.5% of male and female participants, respectively). HPV infection from high risk types was observed in 6 of 106 samples (5.7%) while 1.9% (2/106) was infected by a low risk type. The most commonly detected HPV type was HPV 53, followed by HPV 16 and HPV 66, while infections from multiple HPV types were recognised in 5 of 6 positive samples (83.3%). At the 12-month follow-up examination, persistent infections were detected in 6 of 6 initially positive samples (100%). Clearance of at least one HPV type-specific infection was observed in 4 of 6 participants (66.7%). For oncogenic HPV types, clearance rate was 35.2%, while for non-oncogenic types clearance rate was 100%. All HPV-53 infections that were detected at baseline examination proved to be persistent.

**Conclusions:** There is a low proportion of young Greek adults with normal oral mucosa is HPV DNA positive. However, infections from multiple and high risk HPV types, especially HPV-53, are common among infected individuals. In addition to these, persistent high risk infections lasting more than 12 months, are not uncommon.

**B050****Measurement properties of patient-rated outcome measures in radiotherapy-induced xerostomia**MB Assas<sup>1,2</sup>, V Mercadante<sup>2</sup>, R Ní Ríordáin<sup>2</sup>, S Fedele<sup>2</sup>, S Porter<sup>2</sup><sup>1</sup>Faculty of Dentistry, Umm Al-Qura University, Makkah, Saudi Arabia, <sup>2</sup>Eastman Dental Institute, UCL, London, UK

**Objectives:** A wide range of patient-reported outcome measures (PROMs) has been used in clinical trials of radiotherapy-induced xerostomia (RIX) to assess response to therapeutic interventions. However it remains unclear which of these instruments is most appropriate for the specific purpose of RIX measurements. As the quality of a PROM depends on the quality of the studies that assessed its measurement properties, we designed a systematic review to assess the measurement properties of available PROMs relevant to RIX.

**Methods:** Electronic searches were performed in MEDLINE, Embase, up to the end of March 2016. Two reviewers independently rated measurement properties using the consensus-based standards for the selection of health status measurement instrument (COSMIN).

**Results:** Five out of 1,700 publications were eligible for inclusion. Four PROMs were evaluated (Xerostomia Questionnaire by Eisbruch, 2001; Xerostomia Inventory by Thompson, 2000; Groningen Radiotherapy-induced xerostomia questionnaire by Beetz, 2010; Xerostomia-related quality of life scale by Henson, 2001). Measurement properties evaluated included internal consistency (3 PROMs), reliability (3), structural validity (2), hypothesis testing (3), criterion validity (1) and responsiveness (5). Evidence for each measurement property is mostly limited as none of the instruments had sufficient evidence of reliability and content validity. In addition, estimates of responsiveness and structural validity measurement were lacking.

**Conclusion:** None of the PROMs that were used in published clinical trials of RIX had been assessed in studies meeting the standard for good methodological quality. They are therefore of unclear and questionable quality.

**Relevance:** When the methodological quality of a study assessing a PROM is inadequate, the quality of the instrument remains unclear. Results of clinical trials using available PROMs cannot be trusted and should be interpreted with caution. There is an urgent need for methodologically appropriate studies aimed at assessing the measurement properties of available or novel PROMs relevant to RIX

**B051****The MOMAX PROJECT: a multidisciplinary approach to oral cancer and OPMD**

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**Objective:** Management of oral cancer and oral potentially malignant disorders (OPMD) has undergone radical change in recent years. Delay in diagnosis affects the treatment and

prognosis of these lesions. Nowadays, a multidisciplinary approach is the tool to guarantee the best treatment plan definition with the ultimate goal to improve survival.

**Methods:** The MoMax project was founded in June 2014 at the Department of Oral and Maxillofacial Sciences of Sapienza University of Rome in order to provide patients with the latest diagnostic techniques for screening, prevention and treatment of oral cancer and OPMD. Key members of this project are oral pathologists, prosthodontists, maxillofacial surgeons, oncologists, radiotherapists and anatomo-pathologists.

**Results:** Among the 315 patients treated, 83 were affected by oral cancer, 80 were affected by OPMD, 152 were affected by other lesions. The most diagnosed cancer was the squamous cells carcinoma (80%); the most frequent localization was the tongue (38.5%). The most diagnosed OPMD was lichen planus (61%); the most frequent localization was the cheek mucosa (32.5%). The most affected group was aged between 60–69 years.

From the first visit to the end of dental treatment, the maximum time recorded to complete the cures has usually been less than two months; in particular, for the oncological patients sent for pre-radiotherapy or pre-chemotherapy protocol, the average time has been 7–14 days.

**Conclusions:** Benefits that accrue to patients from a multidisciplinary approach include the efficiency of: having multiple consultations in a short period of time without having the patient travel from one ambulatory to the next; avoiding delays in obtaining consultative appointments; ensuring that the most appropriate therapy is applied first and providing patient and family education.

**B052****Laser therapy of recurrent aphthous stomatitis: a systematic review**

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**Objectives:** To review the literature for studies analysing the effect of hard and soft laser therapy on recurrent aphthous stomatitis regarding wound healing, pain and frequency of recurrence.

**Material and methods:** The used databases were Medline, Embase and Cochrane library. A PICO approach was applied as search strategy. After scanning and excluding the studies in three steps (titles, abstracts and full texts), 11 studies were included in this systematic review. Two observers (SS and VS) selected the studies and extracted the data.

**Results:** Six studies used low level laser treatment (LLLTL), and five studies applied hard laser (Nd:YAG laser, CO2 laser). Control groups included placebo, no therapy or topical corticosteroid treatment. The duration of wound healing was shorter than in the control patients in three studies (out of five analysing this outcome) after LLLTL and in three studies (out of four analysing this outcome) after hard laser application. The method to evaluate wound healing varied considerably between the studies. Significant pain relief was found immediately after LLLTL in three studies and after the use of CO2 laser in two out of three studies. Pain relief in the days following treatment was recorded in four hard laser and in three LLLTL studies. The episode of frequency could not be evaluated because the only study assessing this variable did not discriminate between laser and corticosteroid treatment. Jadad scores for quality assessment of the studies (ranging from 0 to 5) were overall lower in the soft laser (0 to 2, mean 0.8) than in the hard laser studies (1–3, mean 1.8).

**Conclusion:** More RCTs for LLLTL and hard lasers on larger groups of participants are necessary to show their superiority over topical pharmaceutical treatment.

**Relevance:** The use of soft and hard laser to relieve symptoms and promote healing of RAS is a therapeutic option and has the advantage of low side effects.

**B053****Sjögren syndrome and thyroid disease: Turin experience and literature review**

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**Objective:** To assess the prevalence of thyroid disease (TD) in 100 patients properly diagnosed with Sjögren's syndrome (SS) undergoing clinical follow-up in the Unit of Oral Medicine Section of the University of Turin, and investigate the possible pathogenic correlation between these two clinical entities according to scientific literature.

**Methods:** 100 SS patients were selected according to the AECG criteria, searching both digital and paper medical charts. Literature research was carried out by drawing on biomedical databases accessible online, selecting "thyroid disease", "thyroid" along with "Sjögren's syndrome", "Sjögren" "primary Sjögren" (pSS), "secondary Sjögren" (sSS).

**Results:** Of the 100 patients selected, 57 were affected by pSS, while the remaining 43 had sSS.

In the pSS group, 13 (22.81%) were found with a concurrent thyroid disease such as hypothyroidism, goiter, and thyroid hyperplasia, whereas 16 (37.2%) of the 43 sSS

patients reported a coexisting thyroid malfunction, predominantly in the form of goiter or autoimmune thyroiditis.

The first studies on the possible association between SS and TD were published in the 1960's, followed by further investigations in the subsequent decades which showed a significant association between high levels of thyroid antibodies and autoimmune diseases, including SS, a higher prevalence of thyroid antibodies and TD in SS patients than in healthy controls, together with a common genetic predisposition HLA-related.

Some of the most recent investigations, however, do not confirm fully the results of earlier studies.

**Conclusions:** Our study showed a higher prevalence of TD in sSS group than in pSS patients. Regarding the pathogenesis, although some authors suggest that the correlation between SS and TD may be related to age and sex overlapping, genetic and immunopathological outcomes support the presence of shared physiopathological mechanisms between the two entities.

**Relevance:** SS patients should undergo periodic examinations to assess thyroid function.

## B054

### DNA ploidy status in oral lichen planus patients

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**Objectives:** Oral lichen planus (OLP) is a potentially malignant disorder with a quite low incidence of malignant transformation not exceeding 1%. Several studies assessed the role of DNA ploidy status as a biomarker in oral oncology for both malignant and premalignant lesions. This study aims to determine the frequency and degree of DNA aneuploidy in OLP patients by high-resolution DNA flow cytometry.

**Methods:** OLP patients referred to our clinic and scheduled for incisional biopsy were consecutively enrolled. Samples were subdivided for formalin fixation and routine hematoxylin and eosin staining for histological assessment and for immediate storage at -20°C for later high-resolution DNA flow cytometry (hr DNA-FCM). The DNA aneuploid sublines were characterized by the DNA Index (DI).

**Results:** Seventy-seven OLP patients entered the study, 47 women and 30 men, age mean 60 years (range 26-84). A DNA aneuploid status was observed in 4 out of 77 cases (5.2%). On the base of the clinical appearance, 67 (87%) patients had a reticular and plaque appearance and 10 cases (13%) had an atrophic-erosive form. The buccal mucosa was the most frequent site of sampling: 64/67 (83.1%) cases, tongue in 8/77 (8.3%) cases, the floor of the mouth in 3/77 (3.9%) cases, gingiva and hard palate in 1/77 (1.3%) case. High resolution DNA-FCM revealed the presence of DNA aneuploidy in only 4 out of 77 cases (5.2%). Considering the clinical aspect all DNA aneuploid cases had a reticular clinical aspect.

**Conclusions:** DNA aneuploidy, as measured by high resolution FCM in fresh/frozen material, is not a common event in OLP lesions.

**Relevance:** The low rate of DNA aneuploidy could reflect the low rate of malignant transformation observed in OLP patients even if the real prognostic value of DNA ploidy analysis in OLP patients remains to be confirmed.

## B055

### Oral cancer on facebook

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**Objectives:** To examine the type and quality of oral cancer information available on Facebook, and to evaluate public engagement with this content.

**Materials and methods:** Facebook was searched for oral cancer content using two search terms "mouth cancer" and "oral cancer". Two authors reported the demographic data of retrieved Facebook pages, and analyzed the content posted in each page over a 1 year period. Public engagement with different types of oral cancer posts on Facebook was calculated by dividing the sum of likes, comments, and shares for each post by the total number of likes for the page over a 1 year period.

**Results:** A total of 1,418 posts from 38 Facebook pages on oral cancer were analyzed. Most Facebook pages on oral cancer were created by professional organizations or academic institutions. Facebook pages on oral cancer posted a total of 1,418 posts over the study period. Overall, advertisements for fundraising or awareness events were the most common type of posts (48.1%, n = 682) followed by educational posts (21.6%, n = 307), news or academic articles (20.2%, n = 287), and posts describing personal experience with oral cancer (10.1%, n = 142). Posts describing a personal experience with oral cancer or telling a patient's story had the highest engagement rate (21.4%).

**Conclusion:** Facebook offers patients an attractive platform to communicate knowledge and share personal experience about oral cancer. It is primarily used by professional organizations and academic institutes as an advertisement tool for fund-raising and awareness events. Users of Facebook tend to engage more with personal posts.

**Relevance:** This is the first study to examine Facebook content on oral cancer, and to demonstrate the potential significance of Facebook in raising public awareness about oral cancer. Findings of the present study will help to understand how social media is being used to communicate knowledge and disseminate information on oral cancer.

## B056

### Cardiovascular diseases in different forms of oral lichen planus

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**Objectives:** To report the prevalence of Cardiovascular diseases (CVD) in a group of patients referred to Oral Medicine and Pathology departments, CIR Dental School Lingotto, Turin, with different forms of oral lichen planus (OLP).

**Methods:** 307 consecutive patients resident in the Piedmont region (North West Italy), with histologically proven OLP were submitted to a complete oral examination; data about CVD were collected with a dedicated questionnaire. Patients with previous myocardial infarction, stroke or procedures of revascularisation were considered positive for CVD.

The study group were divided in 2 subgroups, subgroup 1 with reticular OLP, subgroup 2, with atrophic and/or erosive OLP. Data were compared with those of the general population, assumed from ISTAT (Istituto Nazionale di Statistica) for Piedmont.

**Results:** The study group was composed of 307 patients (108 males, 199 females), mean age 59.49 ± 11.26 years; 22 (7.1%) were positive for CVD; in subgroup 1 (184 patients with reticular OLP), 10 (5.4%) were positive for CVD, whereas in subgroup 2 (123 patients with atrophic-erosive OLP) 12 (9.7%) were positive for CVD. The differences between the 2 subgroups were not statistically significant (P = 0.08).

**Conclusions:** CVD are a leading cause of death in the world. Chronic inflammatory diseases are important risk factors, but data about OLP are not clear.

In our study group the general prevalence of CVD is similar to the one of the general population.

A nearly double prevalence has been found in the most inflamed form of OLP; a study with a larger number of patients is suggested.

**Relevance:** Atrophic-erosive OLP patients should be considered to possibly be at higher risk for CVD.

## B057

### TLR-dependent immune response in oral tongue squamous cell carcinoma

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**Objectives:** Toll Like Receptors (TLRs) are important members of the Pattern-Recognition Receptors family and play a pivotal role in innate immune defense in many types of cancer. They may support tumor progression upregulating NF-κB pathway or cancer inhibition inducing type 1 interferons. The immunohistochemical expression of TLR4 and TLR9 and the correlation with their downstream targets NF-κB and IFN-β, was studied in Oral Tongue Squamous Cell Carcinoma (OTSCC) tumor samples of variable HPV status and tumor grade.

**Methods:** The study sample consisted of 63 OTSCC cases (29 males and 34 females, mean age 59.3 years, range 26-83). Immunohistochemistry (IHC) was used to assess the protein expression of TLR4, TLR9, NF-κB(p65) and IFN-β. IHC stains were graded according to intensity and percentage of positive tumor and inflammatory cells. IHC results were correlated with histopathological characteristics, including degree of differentiation, and HPV status (as evaluated by real-time PCR positivity and p16 expression in >70% of tumor cells).

**Results:** All molecules were expressed at different levels in both tumor and inflammatory cells in the vast majority of cases. The mean values of IHC scores for TLR4, NF-κB and IFN-β (but not TLR9) were significantly correlated with tumor degree of differentiation.

**Conclusions:** The expression of TLR-4, TLR-9, NF-κB and IFN-β in OTSCC indicates their possible participation in oral carcinogenesis. Positive correlation of TLR4, NFκB and IFN-β with tumor grade, as well as TLR9 with HPV infection, suggest possible functional roles.

**Relevance:** Understanding the role of TLR-4, TLR-9 and their downstream targets NF-κB and IFN-β may provide clues to the pathogenesis of OTSCC.

**B058****Mapping electrical impedance spectra of healthy oral mucosa: a pilot study**

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**Objective:** Electrical impedance is the resistance to the electric current flow through a tissue and depends on the tissues, structure and chemical composition.

The aim of this study was to map electrical impedance spectra for each region of healthy oral mucosa.

**Materials and methods:** Electrical impedance was measured in 30 participants with healthy oral mucosa. Measurements were performed in 14 points on the right and left side of the oral cavity, and repeated after 7 and 14 days respectively.

**Results:** The lowest values were measured on the tongue dorsum and the highest values on the hard palate. No significant differences were found between the right and the left side. Significantly higher values differences were found in females on the upper labial mucosa, tongue dorsum and ventral tongue. Significant difference between smokers and non smokers on the lower labial mucosa and floor of the mouth was found. Electrical impedance was negatively correlated with salivary flow on the upper labial mucosa, hard palate, tongue dorsum and sublingual mucosa. Higher variability of measurements was found at low frequencies.

**Conclusion:** Electrical impedance mostly depends on the degree of mucosal keratinization. Demographic and clinical factors probably affect its values. Further studies with bigger number of participants are required.

**B059****Salivary hormones and oral MUC1 expression in burning mouth syndrome**

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**Objectives:** The dysregulated psychoendocrinological mechanisms and altered oral mucosal integrity have been suggested as one of etiological factors for burning mouth syndrome (BMS). The aim of this study was to investigate the relationships among oral mucosal epithelial MUC1 expression, salivary female gonadal hormones and stress markers, and clinical characteristics in patients with BMS.

**Methods:** Thirty female patients with BMS after menopause (60.0 ± 5.0 years) were included. Clinical and psychological evaluations were done. Blood tests were performed to exclude patients with other possible systemic factors which may cause oral burning pain. Patients with high blood contamination levels in their saliva samples and patients who began the menopause less than 2 years were excluded. The expression level of oral mucosal epithelial MUC1 was analyzed by real-time polymerase chain reaction. Salivary levels of cortisol, dehydroepiandrosterone (DHEA), 17 $\beta$ -estradiol, progesterone, chromogranin A (CgA), and blood contamination were determined from unstimulated whole saliva (UWS) and stimulated whole saliva (SWS) samples by enzyme immunoassay.

**Results:** The salivary level of progesterone showed significant positive correlations with the oral mucosal MUC1 expression level, and with cortisol and DHEA levels in UWS and SWS. The salivary level of 17 $\beta$ -estradiol had significant positive correlations with period of symptom duration, severity of effects of oral complaints on daily life, and results from psychological evaluations. The level of cortisol in UWS and cortisol/DHEA ratio in UWS and SWS had significant negative correlations with severity of oral burning sensation. The severity of taste disturbance showed significant positive correlations with results from psychometry.

**Conclusions:** The dysregulated psychoendocrinological interactions affect the oral mucosal MUC1 expression and development of oral burning sensation in patients with BMS.

**Relevance:** Clinicians should keep in mind the complex pathophysiology of BMS including psychological, neurological, and endocrinological aspects and their interactions.

**B060****Oral cancer awareness and relation to lifestyle campaign among students**

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**Objectives:** Oral cancer represents one of the most common but scarcely known malignancies. Aetiology is strongly related to lifestyle habits and behaviour, especially tobacco smoking, alcohol abuse, exposure to UV rays and HPV infection. The mean age of individuals who start smoking and alcohol drinking is decreasing, thus people are starting to expose to risk factors in young age. The aim of our campaign is to test the awareness and increase knowledge about oral cancer among young preadolescents.

**Methods:** A lecture about carcinogenesis, oral cancer characteristics and risk factors was prepared by clinicians attending the Oral Pathology and Medicine Department. Two questionnaires have been submitted to investigate the knowledge and awareness of oral cancer and its risk factors before the lecture, and to test the understanding of key facts and the appreciation of the initiative after the lecture.

**Results:** The study included 310 middle school students from 12 to 14 years old. From the results of the questionnaires, only 29.4% of the students knew about the existence of oral cancer and most of them didn't recognize it as a malignancy. The majority had heard about it from school and family/friends, but only 10.9% from the dentist. 2.9% among the students' family members or friends experienced oral cancer. After listening to the lecture, the students answered differently to questions regarding risk factors, survival rate, early diagnosis ( $P < 0.0001$ ), increasing their awareness about the disease. The appropriateness of such a campaign was rated 8.9/10 and the overall appreciation rate was 8.7/10.

**Conclusions:** Our survey confirmed that oral cancer awareness is generally low among pre-adolescents.

**Relevance:** The present study shows how social campaigns, especially among young students, seem to be appreciated and may represent a powerful strategy for increasing knowledge about risk factors, that are highly related to lifestyle habits and behaviour.

**B061****Role of Ki67 expression in mucosa distant from oral carcinoma**

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**Objectives:** The aggressive behavior of Oral Squamous Cell Carcinoma (OSCC) has been related to the "field cancerization concept" as the mucosa surrounding the primary mass presents genetically altered epithelial cells that can escape clinical and histological examination. Two of our previous studies proposed the analysis of Ki67 expression in areas distant from the original tumor, specifically in the clinically and histologically normal mucosa opposite the primary OSCC.

Aim of the study was to determine whether an abnormal cell turnover in clinically and histologically "normal" mucosa distant from the primary tumor is associated with a poor prognosis in terms of Loco Regional Control (LRC) of disease and Disease-Specific Survival (DSS).

**Methods :** This prospective study monitored 55 OSCC patients surgically treated from 2004 to 2009. Cell turnover in areas clinically and histologically distant from the tumor mass (opposite cheek) was evaluated by immunohistochemical expression of Ki67. A Ki67 value >20% was considered "high" as reported in previous studies.

**Results :** The mean follow-up period of the population studied was 53.7 ± 32.4 months; range 12–110 months. High Ki67 values (>20%) were observed in 18/55 patients. 12/18 cases (66.7%) with "high" Ki67 values (>20%) presented a second locoregional neoplastic manifestation and 7/18 (38.9%) died of disease.

Multivariate analysis showed that the Ki67 value in distant mucosa was a powerful independent prognostic factor for LRC. In addition, high Ki67 expression in distant mucosa was the only variable statistically related to worse LRC ( $\chi^2$  9.5;  $P = 0.002$ ) and DSS ( $\chi^2$  5.1;  $P = 0.02$ ) in T1-2N0 OSCCs.

**Conclusions :** The present study confirmed Ki67 in distant area as an important prognostic factor for OSCC patients

**Relevance:** Ki67 expression in distant mucosa could be included in the list of the clinicopathological markers utilized for therapeutic protocol.

**B062****Characterization of a population (312 patients) with burning mouth syndrome**

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Burning mouth syndrome (BMS) is a burning sensation of the oral mucosa in the absence of local or systemic predisposing factors. BMS has a negative impact on the life of patients. Prevalence varies between 0.7–12.2%.

The purpose of the study was to characterize a population of patients with BMS in an Oral Medicine clinic in Portugal comparing it to the bibliography.

Retrospective, observational, transversal and comparative study. 9,595 clinical records were analyzed and the patients were characterized by age, gender, diagnostic delay, number of consultations prior to diagnosis, symptoms and affected oral sites. A descriptive and inferential statistical analysis (chi-square test, significance level 5%) was performed.

312 patients diagnosed with BMS were identified (fem = 85%/male = 15%). 62% of the patients complain of pain/burning sensation, 14% xerostomia and 10% dysgeusia. Majority of patients, (76%) refer symptoms affecting the tongue, anterior 1/3 of the hard palate and lower lip. 7% have generalized oral pain. Cancerophobia was found in 10%. 42% of the patients at our first consultation were under psychiatric treatment or psychotropic drugs, and the same percentage were submitted to invasive complementary examinations (biopsy, TC, MRN...), 22.3% had other specialties appointments (INT, gastro...).

In our study, BMS affects mainly women over 45 years of age and a significant diagnostic delay with a correspondent increased number of unnecessary consultation/medications/tests was observed. Early diagnosis is the key to prompt treatment and to increase the quality of life of the patients as well as to reduce associated costs.

The medical community needs more information regarding this condition in order for patients to receive adequate treatment in time.

## B063

### miRNA profiling expression from oral brushing in OSCC patients

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**Objectives:** microRNAs have recently proposed as potential biomarkers in the early detection of Oral Squamous Cell Carcinomas (OSCCs) by noninvasive methods.

Aim of the present study was to analyze the expression of a panel of miRNAs in epithelial cells collected by oral brushing from OSCCs and their respective normal mucosa in distant areas and from regenerative areas after OSCC surgical resection

**Methods:** Oral brushing specimens were collected from: 13 OSCC (group 1a) and their respective normal mucosa in distant areas (group 1b), 12 samples from regenerative areas after OSCC surgical resection (group 2a) and their respective normal mucosa in distant areas (group 2b), 17 lichenoid lesions (group 3) and 24 normal mucosa from healthy controls (group 4). In all different groups the expression levels of miRNAs were evaluated by real time PCR. Seven target were evaluated (i.e. mir-21, miR-375, miR-345, miR-181b, miR146a, miR-649, miR-518b). The miRNA expression levels across groups were assessed by ANOVA statistics or student t test for paired samples

**Results:** miR345, miR146, miR649 e miR518 showed a significant different expression in OSCC group with respect to healthy donors, but a similar and not significant expression with respect to their respective normal mucosa in distant areas (group 1b). Moreover miR146 showed a significantly different expression in regenerative areas after OSCC surgical resection with respect to healthy donors, but not significant difference with respect to their respective normal mucosa in distant areas. No significant differences were found between lichenoid lesions and healthy donors in any miRNAs analyzed.

**Conclusions:** miRNA analysis in epithelial cells collected by oral brushing has demonstrated the presence an altered profile expression not only in OSCC but also in distant areas from OSCC and in regenerative areas after OSCC surgical resection

**Relevance:** Analysis of miRNA expression from oral brushing could be proposed as a non invasive method to study oral mucosa in OSCC patients.

## B064

### Orofacial aspects, caries experience and salivary parameters in Moebius syndrome

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**Objectives:** The aim of this study was to assess orofacial characteristics, the prevalence of caries, plaque index, and periodontal status, in individuals with Moebius syndrome and controls, and to evaluate salivary characteristics, such as flow, buffering capacity and amylase activity, in order to associate the salivary parameters with oral health.

**Methods:** A total of 90 participants were divided into two groups. The study group was composed of 34 individuals with Moebius syndrome and the control group of 56 age and gender-matched healthy subjects. The researchers assessed caries using the International Caries Detection and Assessment System (ICDAS), periodontal disease (PSR), and plaque (Silness Loe) indexes in both groups. Un-stimulated, stimulated and bilateral parotid saliva were collected and the salivary flow,  $\alpha$ -amylase activity, and buffering capacity were obtained from 30 participants.

**Results:** The occurrence of carious lesions for early-stage caries, i.e., ICDAS scores of cut-off 1 and 2, as well as the occurrence of periodontal disease were significantly higher ( $P > 0.05$ ) among studied group when compared to the control group. Moebius syndrome

individuals presented equivalent plaque index, decreased salivary flow, decreased buffering capacity and higher amylase activity, compared to controls.

**Conclusions:** Our results on salivary flow rate, amylase activity and buffer capacity help to elucidate the high incidence of dental caries in subjects with MS.

**Relevance:** These results provide novel information regarding altered salivary characteristics and dental caries increased risk on individual with Moebius syndrome.

## B065

### Optical coherence tomography in oral medicine: preliminary in vivo study

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**Objectives:** To introduce an OCT (Optical Coherence Tomography) *in vivo* database of oral diseases, by means of the VivoSight® OCT (Michelson diagnosis) scanner.

**Methods:** This research is a double-blind design study, with two independent evaluators: one oral medicine expert for clinical evaluation and OCT images and a pathologist for histological images examination.

Twenty patients (M 6/F 14; mean age 50 years) with oral mucosal diseases have been selected. After informed consent, clinical inspection was followed by OCT assessment, obtaining the scans (for lesion >4 cm, a 6 mm diameter portion of the area considered for incisional biopsy; for lesion <4 cm, an OCT scan over a 6 mm diameter central area of the entire lesion). Representative sections of lesions were selected by pathologist and photographed under light microscopy. The OCT images and histopathological sections have been compared.

**Results:** Basal histological layers (keratin cell layer, basement membrane and lamina propria) were identified in almost of OCT images (85.0 %); particularly, at both OCT and histological evaluation, a) benign lesions are characterized from acanthosis in the spinous layer (a pronounced white stratum), and b) malignant lesion and ulcers showed clearly the basement membrane break down. Conclusions

In our small group, data showed a concordance OCT and histopathological images and further researches are needed.

**Relevance:** Several studies have investigated the potential validity of OCT use in the assessment of oral lesions but, to date, an *in vivo* database of oral tissues does not exist. Although with limitations of our probe (too bulky for use in the oral cavity), of the sample size and of movement fakes, it is our opinion that OCT could be a non-invasive tool for the diagnosis and follow-up of oral diseases.

## B066

### The importance of coordination between hematology and dentistry: a retrospective study on the development of BRONJ in patients affected by multiple myeloma

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**Objectives:** Multiple myeloma is a rare tumor, localized predominantly in the bone marrow. Endovenous bisphosphonates are usually administered to patients affected by this disease. As widely reported in the Literature, development of ONJ is a possible side effect.

The present 5 year retrospective study was intended to evaluate the efficacy of appropriate dental treatment protocols before starting bisphosphonate therapy, to prevent ONJ development.

**Methods:** 99 patients affected by symptomatic multiple myeloma have been involved in this study. Data concerning visits and dental treatments were outlined using a specific server and consulting clinical reports. AAOMS guidelines were applied for both diagnosis and treatment. 79 patients were visited before Zoledronate administration (group A) and 20 after (group B).

**Results:** All patients required dental treatment: 23.2% underwent restorative therapy, 8% endodontic therapy, 44.4% extractions. Periodontal disease affected 41.4% of the patients. No osteonecrosis was observed in group A, whereas ONJ was found in 5 patients of group B (25%) and 2 patients (10%) presented osteosclerotic areas in phase of assessment [OR 0.026 (CI 0.0027 to 0.2454)].

**Conclusions:** There are no data regarding the exact prevalence of BRONJ in the Literature, but according to our data, the risk is widely reduced by performing a dental visit before treatment with BFs. RCTs and a long-time follow-up are needed to confirm this statement.

**Relevance:** Within the limits of this retrospective study we point out that diagnosis and dental treatment before starting the treatment with endovenous bisphosphonates significantly reduces the incidence of ONJ.

## B067

**Salivary flow as predictor factor for serum triglyceride in elderly**

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Recently the use of saliva as a diagnostic tool is preferred because of its non invasive method. Triglyceride is one of the chemical constituents commonly examined in elderly for systemic condition screening.

**Objectives:** To observe whether salivary flow can be used to predict the level of serum triglyceride in elderly.

**Methods:** This cross-sectional study involved 79 elderly patients (F: 33, M : 46) aged  $\geq 60$  years in Yogyakarta Indonesia. The fasting serum triglyceride was measured and salivary flow per minute was determined by measuring whole unstimulated salivary flow using spitting method. The data then were analysed statistically using Simple Regression Analysis.

**Results :** Means of serum triglyceride and salivary flow/min were  $145.41 \text{ mg dl}^{-1}$  and  $0.46 \text{ ml}$ , respectively. From the statistical analysis showed that salivary flow  $\text{min}^{-1}$  can be used to predict the level of serum triglyceride with the equation of  $y = 115.99 + 64.54 x$  ( $y = \text{serum triglyceride}$ ,  $x = \text{salivary flow/min}$ ) with  $r$  (Pearson Correlation) = 0.28 (Sig = 0.013).

**Conclusions:** It appears that salivary flow can be used to predict the level of serum triglyceride in elderly.

**Relevance:** Measuring of salivary flow is one of promising methods to screen some systemic problems in elderly. It is a nice, easy, non invasive, unfrighting method for patient and it can be done by everyone (unnecessary to be trained).

## B068

**TNF- $\alpha$ , TNF- $\beta$  and IL-10 gene polymorphism and association with oral lichen planus risk in Saudi patients**

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**Objectives:** Oral lichen planus (OLP) is a chronic inflammatory oral mucosal disease. Cytokines play an important role in the pathogenesis and disease progression of OLP. The purpose of this study was to investigate the association of tumor necrosis factor (TNF)- $\alpha$ , TNF- $\beta$  and interleukin (IL)-10 gene polymorphisms with the OLP risk.

**Material and methods:** Forty two unrelated patients with OLP and 211 healthy volunteers were genotyped for TNF- $\alpha$  (-308 G/A), TNF- $\beta$  (+252A/G), IL-10 (-1082G/A), IL-10 (-819C/T), and IL-10 (-592C/A) polymorphisms.

**Results:** The frequencies of allele A and genotype GA of TNF- $\alpha$  (-308G/A) were significantly higher while allele G and GG genotypes were lower in OLP patients as compared to the controls ( $P < 0.001$ ). The frequency of GA genotype of TNF- $\beta$  (+252A/G) was significantly higher in patients than in controls while the AA genotype was completely absent in OLP patients. These results indicated that allele A and genotype GA of TNF- $\alpha$  (-308G/A) as well as the GA genotype of TNF- $\beta$  (+252A/G) polymorphisms are associated with OLP risk. The frequencies of alleles and genotypes of -1082G/A, -819C/T and -592C/A polymorphisms in IL-10 gene did not differ significantly between OLP patients and controls ( $P > 0.05$ ). However, haplotype ATA extracted from 1082G/A, -819C/T, -592C/A polymorphisms of IL-10 were more prevalent in OLP patients when compared to controls indicating its possible association with OLP susceptibility.

**Conclusion:** It is concluded that TNF- $\alpha$  (-308G/A), TNF- $\beta$  (+252A/G) and IL-10 (-1082G/A, -819C/T and -592C/A) polymorphisms are associated with the susceptibility of OLP, thus giving additional support for the genetic basis of this disease. Further studies are required using a larger sample size to confirm this association and determine the prognostic values of these findings.

## B069

**The risk of developing infective endocarditis in presence of oral health disease: a case controlled study**

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**Objectives:** Infective endocarditis (IE) is a rare disease of the endocardium, which is fatal, if untreated. Several guidelines are available, focusing on dental procedures as a source of bacteraemia.

The aim of this study is to evaluate the risk of IE development, depending on oral lesions, predisposing heart conditions and systemic comorbidities.

**Methods:** 70 patients affected by IE were enrolled (Cases). Infective diseases of the oral cavity, cardiac predisposing conditions (stratified according to the classification AHA, 1997) and comorbidities have been evaluated for each patient.

Three control groups have been identified: 70 healthy patients (Group 1), 50 patients with non-infective cardiovascular disease (Group 2) and 70 patients with systemic comorbidities (Group 3). The data were compared using Chi Square analysis (CI 95%); OR, sensitivity, specificity, positive and negative predictive values were calculated.

**Results:** Among the Cases, the most frequently affected site was the aortic valve (57.9%) followed by the mitral valve (31.2%) and both valves together (4.4%). The most common predisposing cardiac conditions were: aortic bioprosthetic valve (11.4%), non rheumatic aortic valve stenosis (8.6%) and bicuspid aortic valve (5.7%). 4 deaths occurred in patients with high risk predisposing cardiac conditions.

In 15 patients, the organism of IE belonged to oropharyngeal flora; dental procedures were performed in 4 cases, antibiotic prophylaxis was administered once.

81.4% of patients affected by IE presented endodontic/periodontal lesions, whereas among control groups those lesions affected 55.9% of patients of group 1, 75.7% of Group 2 and 88% of group 3. The results show a higher risk of IE development in patients with infective diseases of the oral cavity, compared to the Control Groups [group 1 (OR = 3.692), group 2 (OR = 0.598) and group 3 (OR = 1.406)].

**Conclusions:** It's not the dental procedure itself that enhances the risk of IE development but the presence of oral infections among patients with predisposing cardiac conditions.

## B070

**Clinical evaluation of a phytotherapeutic based dentifrice *Rosmarinus officinalis* Linn on dental biofilm**

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**Objective:** The aim of this study was to evaluate the perception and impact on quality of life of patients diagnosed with xerostomia.

**Methods:** The sample was composed of 14 patients with xerostomia from the stomatology clinic of Federal University of Pernambuco during the year 2015. The patients were allocated into 2 distinct groups, according to the treatment received: artificial saliva + pilocarpine (E1) for treatment of xerostomia, or artificial saliva + placebo (E2). Prior to the administration of treatment/placebo (T0), the survey OHIP-14 for evaluation of perception and impact on quality of life was applied. The same survey was applied after an elapsed period of 2 (T2) and 4 (T4) weeks.

**Results:** At T0 the average score obtained was  $13.30 \pm 7.48$ , while at T2 and T4 the score was  $5.66 \pm 7.30$  e  $2.37 \pm 5.67$  respectively for both groups. We observed that the relation between groups was statistically significant only on the physical inability domain at T0 ( $P = 0.043$ ). The correlation within the same group significant findings could be observed on the following domains: functional limitation for E2 group ( $P = 0.039$ ); physical pain for groups E1 ( $P = 0.043$ ) and E2 ( $P = 0.046$ ); psychological discomfort for E2 group ( $P = 0.046$ ) and at T4 ( $P = 0.027$ ); psychological inability for E2 group ( $P = 0.043$ ); social disability for E2 group ( $P = 0.043$ ) and deficiency for E2 group ( $P = 0.038$  and  $0.020$ ).

**Conclusions:** Considering the results of this study, it is suggested that, because of the reduction of xerostomia, the individual improves quality of life.

**Relevance:** The treatment of xerostomia is important to the quality of life of patients with xerostomia and hyposalivation.

## B071

**Quality of life in kidney transplant recipients after implant treatment**

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**Objectives:** The main endpoint observation of this long-term prospective controlled study was to evaluate the improvement of quality of life (through Oral Health Impact Profile (OHIP)-14 scale) in kidney transplant patients after receiving an implant treatment and to compare the results with a control group.

**Methods:** Two groups, including 22 kidney transplant patients (KTG), and 24 controls (CG), received 79 and 86 Nobel Biocare implants between the years 2000 to 2009. Pain and wound healing were evaluated immediately after the procedure. The Oral Health Related Quality of Life (OHRQoL) was evaluated through OHIP-14 validated in Spanish before and after implant treatment. Final examination was carried out after a mean follow-up of 112.1 and 107.4 months.

**Results:** Both groups were homogeneous with respect to age, gender, follow-up, and number, diameter and length of the fixtures placed. All the patients had a follow-up of more than 60 months. The implant survival rate was 100% for the KTG, and 97.7 % in the CG. Implant procedure was not accompanied by higher levels of pain in these patients



with respect to CG. Almost all the items showed statistically significant intragroup differences between previous and posterior OHIP-14 in the KTG and the CG.

**Conclusions:** Despite the limitations of the small sample size, it seems that there is an evident improvement of quality of life, measured through OHIP-14 scale, after implant treatment in immunosuppressed kidney transplant patients and these patients may be successfully treated with this procedure.

**Relevance:** This is the first study that measures the improvement in quality of life after implant treatment in immunosuppressed kidney transplant recipients.

## B072

### Correlation between salivary Tyrosine and GPx in oral lichen planus

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**Objectives:** The diagnosis of oral lichen planus (OLP) is based on clinical examinations and histopathological criteria. Non-invasive diagnostics of saliva may be considered as a confirmation of diagnosis OLP and a potential alternative to invasive method. The objective of the present study was to evaluate the relationship between the level of Tyrosine (Tyr) and Glutathione Peroxidase activity (GPx) in saliva of patients with oral lichen planus (OLP) and compared it with control group - healthy without any oral changes.

**Methods:** We selected for the study a total of 40 patients with OLP and 40 without any oral lesions based on the modified WHO diagnostic criteria (clinical and histopathological). A high-performance liquid chromatography (HPLC) was performed for Tyr, and GPx analyses.

**Results:** The concentration of Tyrosine and GPx activity correlated positively in the saliva of studied groups ( $P < 0.05$ ;  $r = 0.83$ ). Mean values of saliva GPx activity differed between patients and controls (365 vs 474 mU ml<sup>-1</sup>, respectively,  $P = 0.003$ ). A similar trend can be seen in saliva Tyr concentration which differed between patients and controls (0.052 vs 0.124 μmol l<sup>-1</sup>, respectively,  $P = 0.002$ ).

**Conclusion:** The relationship between the concentration of Tyr and GPx activity may be helpful to apply a HPLC method as additional non-invasive diagnostic procedure to screen OLP patients from healthy one.

**Relevance:** Non-invasive diagnostic of salivary Tyrosine and GPx could be an effective test to screen a patients with oral diseases and it needs further study.

## B073

### DoctOral: the first app for tutoring in oral medicine

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**Objectives:** To introduce the first app mobile, named *DoctOral*, created for tutoring dentists and students in the clinical recognition of oral lesions and dental treatment planning in patients at risk of ONJ.

**Methods:** The main function of *DoctOral* app mobile is an Italian one decisional algorithm regarding the first clinical recognition of lesions in the oral cavity; a second function is a roadmap useful for planning dental treatments in patients at risk of drug-related osteonecrosis of the jaw.

The first function is based on the recognition of elementary lesions in the oral cavity, differentiating them by colour, morphology and aetiology. The user can select multiple-choice questions, leading to one or more diagnostic hypotheses (each supported by clinical images and information). At the end of the tree, if necessary, it is possible to request via e-mail a service support (...).

The second function allows to consult some guided pathways decisional algorithm regarding the dental treatment of cancer and osteometabolic patients, at risk of drug-related osteonecrosis of the jaw (in pre- or post-therapy), according to the Recommendations of Italian Scientific Societies (SIPMO and SICMF).

**Results:** Up to date, in the first four months, *DoctOral* has been used by 1,698 and 1,340 people, respectively for IOS and ANDROID devices, and in about 50 cases it gave support for the diagnosis, by email.

**Conclusions and relevance:** *DoctOral* seems to be an useful tool for improving in health professionals and student interest forward to Oral Medicine, for helping the first clinical recognition of oral lesions and the dental treatment planning in special patients.

## B074

### Podoplanin overexpression as predictive marker of dysplasia in oral leukoplakia

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**Objectives:** Immunohistochemically analysis is a simple and non expensive procedure that is frequently used to discriminate lesions at risk of malignant transformation. Recent studies have emphasized the role of podoplanin as a promising biomarker to early detect oral leukoplakias (OLs) at risk of developing OSCC. In the present study we investigated a group of OLs to evaluate a possible relationship between altered expression of podoplanin and presence of dysplasia, and to compare the results with those obtained with other widely used biomarkers.

**Methods:** The population consisted of 32 consecutive patients with a clinical and histological diagnosis of OL. Twenty-nine lesions showed absent/mild dysplasia, while 3 lesions presented moderate/severe dysplasia. Immunohistochemically expression of podoplanin, p53 and Ki67 was analyzed in all samples. Lesions with podoplanin expression in the suprabasal layer of the epithelium (pattern 2 in Kawaguchi classification) were considered as positive, whereas the cut off for both p53 and Ki67 overexpression was set to 20% of positive cells.

**Results:** Podoplanin resulted positive in 2 out of 3 samples with moderate/severe dysplasia and only in one sample with absent/mild dysplasia; the difference resulted statistically significant (Chi square 12.79 p.05). Podoplanin showed a sensitivity (66%) similar to both Ki67 and p53 to detect OLs with moderate/severe dysplasia, but a higher specificity (96.6%) with respect to Ki67 (29.6%) and p53 (72.4%).

**Conclusions:** Podoplanin has demonstrated a good reliability to discriminate lesions with epithelial dysplasia.

**Relevance:** Podoplanin expression by immunohistochemistry could be introduced in routine practice as a marker to discriminate OLs at risk of developing cancer.

## B075

### Serum C-reactive protein as biomarker of denture stomatitis in diabetics

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**Objectives:** C-reactive protein (CRP), an acute phase reactant, is a sensitive marker of inflammation associated with diabetes. Candida-associated denture stomatitis (CaDS), is a common oral mucosa disease in denture wearers with type 2 diabetes mellitus (T2DM). The aim of this study was to determine the concentrations of CRP in patients with T2DM and CaDS, and investigate the relationship between CRP concentrations and glycated hemoglobin A1c (HbA1c) levels, which was used as an indicator of glycemic control.

**Materials and methods:** The study involved 110 T2DM patients (63 women and 47 men, mean age 63.2 ± 10.5 years) with CaDS, and 20 patients (12 women and 8 men, mean age 65.8 ± 12.9 years), with T2DM and healthy oral mucosa. A group of 20 non-diabetics (11 women and 9 men, mean age 59.2 ± 9.9 years) with healthy oral mucosa served as a control. The yeasts were isolated by the culture method, and identified by microscopic examination and with the test kit, ID 32 C (bioMerieux SA, Marcy-l'Etoile, France). Serum concentrations of C-reactive protein (CRP) were determined by a high sensitivity immunoturbidimetric immunoassay. Glycemic control was evaluated by measuring HbA1c levels using HPLC together with the Variant Hemoglobin A1c Program (Bio-Rad Laboratories, Hercules CA, USA).

**Results:** The mean duration of diabetes was 10.6 ± 5.1 years, and the mean HbA1c levels in T2DM subjects were 8.6 ± 1.9%. Patients with T2DM had significantly elevated mean levels of CRP in comparison to patients with normal glucose metabolism (6.12 ± 2.86 vs 2.57 ± 0.96 mg l<sup>-1</sup>,  $P < 0.001$ ).

**Conclusions:** The findings suggest that CRP concentrations can be used as a non-specific indicator of ongoing inflammation in patients with T2DM.

**B076****IMRT delivers lower radiation doses to dental structures than 3DRT in head and neck cancer patients**

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**Objective:** To assess whether intensity-modulated radiotherapy (IMRT) delivers lower radiation doses to dental structures than 3D conformal radiotherapy (3DRT).

**Material and methods:** Radiation dose delivery to dental structures of 80 patients treated for head and neck cancers (oral cavity, tongue, nasopharynx and oropharynx) with IMRT (40 patients) and 3DRT (40 patients) were assessed by individually contouring tooth crowns on patients' treatment plans. Clinicopathological data were retrieved from patients' medical files.

**Results:** The average dose of radiation to teeth delivered by IMRT was significantly lower than with 3DRT ( $P = 0.007$ ); however, only patients affected by nasopharynx and oral cavity cancers demonstrated significantly lower doses with IMRT ( $P = 0.012$  and  $P = 0.011$ , respectively). Molars received more radiation with both 3DRT and IMRT, but the latter delivered significantly lower radiation in this group of teeth ( $P < 0.001$ ), whereas no significant difference was found for the other dental groups. Ipsilateral teeth received higher doses than contralateral teeth with both techniques and IMRT delivered significantly lower radiation than 3DRT for contralateral dental structures ( $P < 0.001$ ).

**Relevance:** IMRT delivered lower radiation doses to teeth than 3DRT, but only for some groups of patients and teeth, suggesting that this decrease was more likely due to the protection of other high risk organs. In addition, the decrease in the radiation doses did not remove teeth from the zone of high risk for radiogenic disturbance ( $>30$  Gy), demonstrating that teeth must be included in the constrained plans of IMRT to decrease the risk of dental damage.

**B077****Retrospective study of the efficacy of local application of Tacrolimus in the treatment of painful geographic tongue**

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**Objective:** To evaluate the efficacy of topical tacrolimus ointment in the treatment of painful geographic tongue (GT).

**Materials and methods:** Retrospective descriptive cohort study conducted in the Department of Dentistry of the University Hospital of Bordeaux from January 2012 to November 2013 was undertaken. Patients with painful GT were treated with topical tacrolimus 0.1% 2x daily for 1 month. The primary endpoint was an assessment of pain with a verbal analogical scale from 0 to 10 on day 0 and 1 and 6 months after treatment. The secondary endpoint was the improvement of the quality of life and food.

**Results:** Thirty-one patients consulted for GT in the period. Seventeen had burns of the tongue. Five patients had a primary burning mouth syndrome and twelve had pain caused by the GT. Ten patients were treated with topical Tacrolimus. During the initial consultation EN had an average of 5.9. GT lesions were present in all cases. A food or burning discomfort during feeding were described by patients. The evaluation after prescribing Topical tacrolimus at one and 6 months showed a marked improvement in the EN, which was spent on average 1.6 and 1.5. A reduction of the lesions was observed in all patients. However lesions persisted and the majority of patients continued to apply topical tacrolimus. No serious adverse events were reported in this series. Only one esophageal pain was reported in three patients.

**Conclusion:** Use of topical Tacrolimus appears effective and well tolerated in the indication of painful GT.

**B078****MRONJ epidemiology: the experience of the "Oncological Network of North-Western Italy"**

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**Objectives:** To assess the incidence of MRONJ and the features of the MRONJ patients (underlying pathology, type of bisphosphonate/biologic agent used, age of diagnosis, location in the oral cavity, staging, treatment required etc.) diagnosed between 2009 and February 2016 in the population of North-Western Italy.

**Methods:** On June 2015, after a workshop held in Alessandria, a regional ONJ Study Group (including oncologists, haematologists, maxillofacial surgeons, and odontostomatologists) was constituted; a case data collection form was mailed to all regional specialist care centers; therefore, all MRONJ cases diagnosed after 2009 were transcribed and collected in a specific database.

**Results:** We identified (up to February 2016) 387 cases of MRONJ (114/273 M/F): patients were affected by breast cancer (139), myeloma (67) prostatic cancer (58) other types of cancer or unspecified (50), osteoporosis or rheumatoid arthritis (77), coexisting pathologies (AR/osteoporosis, breast cancer/osteoporosis) in three cases. The first BF used was mainly zoledronic acid (27 thirteen cases were strictly related to biological agents such as denosumab (9), bevacizumab (2), sunitinib (1)).

The trend of MRONJ in oncologic patients between 2009 and 2015 showed a constant incidence rate, with a mean of 39 new cases per year; on the other hand, the trend of MRONJ diagnosis for non-oncological patients appeared to be much more fluctuating between the years, with a mean of 7.85 new cases per year.

Interesting data came from the first 2 months of 2016, where ten MRONJ cases have already been diagnosed in non-oncologic patients, thus anticipating the possibility of a remarkable rise of the total incidence for the current year.

**Conclusions:** In this series we confirm that MRONJ was not a rare event in our region and its frequency has sharply increased after 2009 even though greater adoption of several measures that include preventive and periodical dental visits.

**Relevance:** Population studies and ONJ registry data collections are urgently needed.

**B079****Treatment modality based on clinical co-relation between myofascial pain syndrome and depression, anxiety, stress scale**

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**Objectives:** To study the role of Depression, Anxiety and Stress in myofascial pain Syndrome (MPS) and formulating a medication management protocol for the treatment of the disorder on the basis of (Depression, Anxiety, Stress) DASS scale and (Visual Analog Scale) VAS scale

**Method:** After obtaining institutional board clearance, 29 subjects for the study were chosen from patients reporting to our department and were graded into 3 groups according to the (Depression, Anxiety, Stress) DASS scale. The VAS scale was used to assess the severity of pain in each patient and the patients suffering from depression were prescribed Amitriptyline 10 mg 1 BD, anxiety patients were prescribed Etizolam 0.5 mg 1 BD and patients suffering from stress were prescribed Zerodol MR (Paracetamol 500 mg, Aceclofenac 100 mg, Tizanidine 2 mg) 1 BD. The VAS and DASS scales from each patient were assessed at 3 week and 3 month intervals respectively. Hence the subjects were categorized into 3 groups respectively and were subjected to ANOVA for statistical analysis.

**Results:** The DASS and VAS scales showed a considerable reduction in the values at 3 weeks and a tremendous decline at the end of 3 months in almost all patients hence indicating a positive correlation towards the medication protocol formulated by us.

**Conclusion:** We conclude that prescribing drugs according to the psychological factor (based on DASS scale) gives more precise results as compared to giving drugs non-specifically.

**Relevance:** The study illustrates the role of psychological parameters in the aetiology of the MPS and a newer treatment approach to treat such patients using DASS scale.

**B080****Quality of life in liver transplant recipients after implant treatment**

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**Objectives:** The objective of this prospective controlled study was to evaluate the improvement in quality of life (Oral Health Impact Profile (OHIP)-14 scale) in liver transplant patients after receiving a dental implant treatment.

**Methods:** Two groups, including 14 liver transplant patients (LTG) and 16 controls (CG), received 48 and 53 Nobel Biocare implants between the years 2000 to 2009. Final examination was carried out after a mean follow-up of 111.5 months. Fixed screw-retained prosthesis was used in all the cases and a very complete maintenance program was carried out during the follow-up. Before and after implant treatment, the Oral Health Related Quality of Life (OHRQoL) was evaluated through OHIP-14 validated in Spanish.

**Results:** Both groups were homogeneous with respect to age, gender, follow-up, and number, diameter and length of the fixtures placed. All the patients had a follow-up of more than 60 months. No implant in LTG was lost during the follow-up and therefore implant survival rate was of 100%. The implant survival rate in CG was 93.75%. Almost all the items showed statistically significant differences between previous and posterior OHIP-14 in both groups.

**Conclusions:** Despite the limitations of the small sample size, it seems that there is an evident improvement of quality of life, measured through OHIP-14 scale, after an implant treatment in immunosuppressed liver transplant patients and these patients may be successfully treated with this procedure.

**Relevance:** This is the first study that measures the improvement in quality of life after implant treatment in immunosuppressed liver transplant recipients.

## B081

### Possible association between oral lichen planus and Hashimoto's thyroiditis

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**Introduction:** Lichen planus (LP) is a chronic inflammatory disease, with cutaneous and mucosal manifestations. It has been often noticed an association between LP with some systemic disorders, usually autoimmune diseases including Hashimoto's thyroiditis (HT).

**Objectives:** The aim of the study is to evaluate a possible association between HT and oral lichen planus (OLP) and to analyse the clinical characteristics of oral lesions in these patients.

**Methods:** We conducted a prospective study of some 52 consecutive OLP patients diagnosed by clinical and histopathological criteria during September 2015-April 2016. In these patients we determined serum levels of anti-TPO and the positive cases were referred for complete endocrine evaluation (Antibodies to thyroglobulin, TSH levels, thyroid ultrasound). We also followed the OLP clinical features (symptoms, clinical form, location).

**Results:** The study group consisted of 52 OLP patients (W / M = 42/10) with mean age of 54.5. Analysing the results of serological markers for HT we observed in 21 (40.38%) elevated serum levels. It is also pointed out that 14 of the patients studied were thus diagnosed with HT based on recommended test. The OLP and HT positive patients group was composed almost entirely of women (W / M = 20/1), with a mean age of 57 years. More than half of them had symptoms at onset (12; 57.14%). The most common clinical forms were keratotic (9; 42.86%) and associated atrophy and white lesions (8; 38.1%). The lesions involved most frequently bilateral buccal mucosa (8; 38.1%) followed by four areas of the oral mucosa (6; 28.57%). This work was supported by Romanian UEFISCDI, Project PCE no. 130/2014.

**Conclusion:** In the group of patients studied, statistical analysis of the results showed a significant association of OLP with HT.

**Clinical relevance:** The need for HT screening in OLP patients, especially in middle-aged women.

## B082

### Immunohistochemical study of LIORF2p and APOBEC3B expression in Sjögren's syndrome

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**Objectives:** Sjögren's syndrome (SS) is a chronic autoimmune disease with a multifactorial aetiopathogenesis, in which activation of the interferon (INF) pathway is considered a hallmark event. The Long Interspersed Nucleotide Elements-1 (L1s) are potential inducers of the type I INF pathway in SS. L1s encode for two proteins, LIORF1p and LIORF2p, which are epigenetically regulated by various mechanisms, including the Apolipoprotein B mRNA-Editing enzyme, catalytic polypeptide-like 3C (APOBEC3) deaminases. In particular, APOBEC3B has been found to be associated with the LIORF2p. The aim of this study was to investigate the immunohistochemical expression of LIORF2p and APOBEC3B in the labial minor salivary glands (MSGs) of SS patients.

**Methods:** LIORF2p and APOBEC3B expression was assessed by a routine immunohistochemical method in MSG tissues from 20 SS patients, classified according to Tarpley's histological criteria, 5 sicca and 5 non-sicca controls. Evaluation of the staining intensity was also performed via Computer Image Analysis.

**Results:** LIORF2p was expressed in 17/20 SS patients and all control cases, while APOBEC3B expression was observed in 15/20 SS patients, 5/5 sicca and 3/5 non-sicca controls. Both antibodies stained the cytoplasm of the ductal epithelial cells, while negative staining was observed in the periductal lymphocytic infiltration in SS patients and the chronic inflammation in the controls. A statistically significant difference was found between the LIORF2p immunostaining in Tarpley IV SS patients compared to the

controls (P = 0.038), as well as between the APOBEC3B expression in Tarpley I SS patients and the controls (P = 0.035).

**Conclusions:** The LIORF2p and APOBEC3B co-expression in the ductal epithelium of SS patients possibly reflects the role of APOBEC3 as an inhibitory mechanism against the inappropriate endogenous expression of L1 elements.

**Relevance:** Impaired epigenetic regulation of L1s by APOBEC3 deaminases may contribute to the activation of type I INF pathway, as an initiating co-factor in SS pathogenesis.

## B083

### Medications as risk factors for hyposalivation in the elderly

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**Introduction:** The number of elderly (persons over 65 years of age), prevalence of chronic diseases and use of various medications are continuously increasing. Until now, more than 500 types of medications causing dry mouth have been described. Antihypertensive drugs, diuretics, antipsychotic drugs, antidepressants, anxiolytics, antihistamines, bronchodilators, gastric/antiulcer drugs, narcotic analgesics and urinary incontinence drugs are commonly listed as causative agents.

**Objective:** The purpose of this investigation was to test the effect of various medications on development of hyposalivation in patients over 65 years of age.

**Methods:** A detailed medical history concerning disorders and medications was taken from elderly patients together with sialometry. Exclusion criteria applied were salivary gland diseases, patients undergoing irradiation therapy, diabetic patients and thyroid gland diseases. On the basis of sialometry results (<1 ml 5 min<sup>-1</sup>), subjects were divided into hyposalivation and control groups. Logistic regression models, having the purpose of estimating odds ratios and 95% confidence intervals, were used to investigate the effects of 10 groups of medications (mentioned above) on occurrence of hyposalivation.

**Results:** A total of 175 patients were included in the investigation, 80 diagnosed with hyposalivation (18 males and 62 females) and 95 controls (36 males and 59 females). Salivary flow rates in hyposalivation and control groups were 0.47 ± 0.29 and 1.76 ± 0.68 ml 5 min<sup>-1</sup> (P < 0.001), respectively. Patients with hyposalivation used significant more medications than controls (3.43 ± 2.3 vs. 2.53 ± 2.12, P = 0.009). Odds ratio for hyposalivation in patients which used antihistamines was 3.96 (95% CI, 1.012–15.497, P = 0.048) and for the use of anxiolytics 6.4 (95% CI, 2.202–18.607, P < 0.001).

**Conclusion:** These results show that the elderly using antihistamines and anxiolytics are at an increased risk for hyposalivation.

**Relevance:** Thorough analysis of the use of medications may be very helpful in detection of patients at risk for development of hyposalivation in the old age, as well as strategic planning of their follow-up and therapy.

## B084

### HPV status of Bulgarian patients with oropharyngeal and oral carcinomas

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**Introduction:** It has been predicted that with the continuing tendency for the increased spread of these viruses, by the year 2020, HPV – associated tumours of the throat will surpass the incidence of cervical cancer as the leading HPV-induced cancers. The attention of specialists in the field has been focused on the association between HPV and oral carcinogenesis. It is highly recommended that each patient with a suspected lesion in the oral cavity should be tested for HPV. HPVs are detected with increased frequency in oral epithelium with dysplasia and with cancer in comparison to findings in cases with normal oral mucosa. Oral HPV infection, especially with high-risk genotypes, has been identified as an independent risk factor for oral squamous cell cancer.

**Aim of the study:** We aimed to investigate consecutive patients with oral papilloma, oral and laryngeal cancer for the presence of HPV.

**Materials and methods:** We investigated 37 consecutive patients with oral papilloma, oral and laryngeal cancer for presence of HPV in biopsy materials by polymerase chain reaction.

**Results:** A few patients are HPV-positive (+) carcinomas. We detected in some patients viral types with low risk of carcinoma progression (HPV 6, 11), and in others high risk HPV –16, 18. The study is in process.

**Conclusion:** The determination of the status of HPV will undoubtedly become standard practice for oropharyngeal and oral carcinomas. There is a few data about correlation of HPV and Oropharyngeal carcinogenesis in the Bulgarian population.

## B085

### Anticholinergic drug scale and dry mouth among community-dwelling older adults

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**Objectives:** To examine whether the anticholinergic burden of the medication, measured by Anticholinergic Drug Scale, is related to stimulated and unstimulated salivary flow or xerostomia.

**Methods:** The study population included 152 community-dwelling older adults from the Oral Health GeMS study in Kuopio, Finland. The data were collected by interviews and clinical examinations during 2004–2005. Carnahan's Anticholinergic Drug Scale (ADS) was used to calculate the anticholinergic burden caused by the medication. Logistic regression models were used to estimate odds ratios (OR) and 95% confidence intervals (CI).

**Results:** After adjusting for confounding factors (age, gender, education, diabetes and rheumatic diseases) participants with ADS  $\geq 4$  were more likely to have low unstimulated salivary flow ( $< 0.1 \text{ ml min}^{-1}$ ; OR: 8.9, CI: 1.9–41) compared to the reference group (ADS 0). Participants with either ADS 1–3 or  $\geq 4$  were more likely to have xerostomia (OR: 3.0; CI: 1.1–8.2 and OR: 5.2; CI: 1.1–23, respectively) compared to the reference group. The ADS was also associated with low stimulated salivary flow but the association was not statistically significant. Additional adjustments for the total number of drugs caused only a slight attenuation of the associations.

**Conclusions:** Anticholinergic burden measured by Anticholinergic Drug Scale is associated with low unstimulated salivary flow and xerostomia, but not with low stimulated salivary flow.

**Relevance:** Anticholinergic Drug Scale can be used as method to identify patients at a risk of low salivary flow or xerostomia related to the drugs with anticholinergic activity.

## B086

### TNFRs polymorphism and serum concentrations in periodontitis and diabetes

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**Objectives:** The aims of this study were to determine if serum levels of TNFR1 and TNFR2 are influenced by parameters of periodontal inflammation and single nucleotide polymorphisms (SNPs) (+36A/GTNFR1 and +676T/G TNFR2).

**Methods:** Subjects were divided into three groups: Type 2 Diabetes (T2D)+Chronic Periodontitis (CP) (group T2D), nondiabetics+CP (Group PD) and healthy controls (group HC). SNPs were assessed using Polymerase Chain Reaction-Restriction Fragment Length Polymorphisms (PCR-RFLP) methods. Cytokines/receptors serum levels were measured using ELISA. Impact of periodontal inflammation on systematic inflammation was measured using Periodontal Epithelial Surface Area (PESA) and Periodontal Inflamed Surface Areas (PISA). Regression models were used to determine influence of behavioral factors on sTNFR.

**Results:** Serum levels of receptors were not influenced by mentioned SNPs at our sample. sTNFR1 were higher at diabetics than in other groups. There was no difference in sTNFR2 level between groups. Presence of T2D predicted sTNFR1, while sTNFR2 were predicted by PESA and PISA. There were no significant correlations between sTNFR1 and clinical periodontal parameters. TNFR2 negatively correlated with periodontal parameters at PD group. These correlations were positive at diabetics.

**Conclusions:** Parameters that quantify burden of inflammation from periodontium on systematic level influenced sTNFR2. These correlations are changed at diabetics compared to healthy subjects. This could lead to assumption that disturbed secretion of cytokines at diabetics diminished the influence of periodontal inflammation on general health presented at healthy subjects.

**Relevance:** Influence of inflammation from periodontium on systematic health has been widely studied, but insufficient number of studies has taken into consideration genetic background at healthy and diseased subjects. According to already proven role of inflammation on diabetes, it is important to quantify influence of periodontal inflammation on diabetes and to take into consideration genetic variations and behavioral factors that can influence serum levels of cytokines and clinical parameters of diseases.

## B087

### Is alteration of warfarin regimen necessary before dental extractions?

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**Objectives:** Most Western studies do not recommend interrupting warfarin therapy or replacing it with heparin prior to tooth extraction if the international normalized ratio (INR) levels are maintained. However, this issue remains controversial between institutions and doctors. The aim of this study was to investigate whether Taiwan Chinese patients who had an INR within the therapeutic range required cessation of warfarin prior to dental extractions.

**Materials and methods:** A total of 60 patients on warfarin with INR.

**Results:** The incidence of postoperative bleeding in the study group was higher (3/33, 9.1%) than in the control group (3/37, 8.1%), but this difference was not significant. Local hemostasis with Gelfoam sponge was sufficient in most patients. Postoperative hemorrhage can be successfully managed by repacking with Gelfoam impregnated with tranexamic acid powder in five patients and resuturing in one patient.

**Conclusion:** The study proved that dental extractions can be performed without interruption or alteration of warfarin regimen in Taiwan Chinese patients, provided the INR is below 4.0. A sufficient hemostasis can be obtained using local measures. This approach can save these individuals from becoming exposed to the risk of thromboembolism and the inconvenience of bridging anticoagulation with heparin.

## B088

### MRONJ risk factors in patients under zoledronate versus antiresorptive-antiangiogenic drugs

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**Objectives:** To highlight the differences between two groups of cancer patients affected by Medication Related Osteonecrosis of the Jaws (MRONJ); Group 1: patients treated with zoledronate and Group 2: patients receiving antiresorptive-antiangiogenic drugs with or without zoledronate.

Five therapeutic approaches in G1 and G2 were also analyzed.

**Methods:** Two hundred and thirteen patients (81 males and 132 females) treated at the Center of Oral Medicine and Laser Surgery of the University of Parma, between January 2004 and February 2016 were included.

G1: 193 patients (90.61%, 68 males and 125 females) and G2: 20 patients (9.39%, 13 males and 7 females). Sites of MRONJ were 200: 176 (SA) in patients in G1 and 24 (SB) in G2.

Twenty one sites of SA and SB were treated with a medical approach (T1) (amoxicillin  $2 \text{ g day}^{-1}$  and metronidazole  $1 \text{ g day}^{-1}$ ); 49 sites (T2) were treated with a medical approach and low level laser therapy (LLLT) applications; 12 sites (T3) were treated with medical therapy and traditional surgery; 37 sites (T4) were treated with medical therapy, traditional surgery and LLLT and 81 sites (T5) were treated with antibiotic, Er:YAG laser and LLLT.

Outcomes were assessed using the scoring system proposed by Vescovi *et al.* Results.

Fifty percent of patients in G2 were male with kidney cancer treated with sunitinib (10, 50%). Maxilla is affected almost twice in G2 (8, 40%) than in G1 (50, 25.77%).

Fifty percent of MRONJ in G2 were spontaneous (10).

Clinical improvement was higher in SA for following treatments: T1 + T2 vs T3 + T4 + T5 (P vs T4 + T5 (P = 0.007)).

**Conclusions:** Male patients affected by kidney cancer are most likely to develop MRONJ; an early surgical approach led in almost every case to complete healing.

**Relevance:** Patients taking antiresorptive-antiangiogenic drugs have a higher risk of spontaneous MRONJ development.

## B089

### Actinic cheilitis in a cohort of rural workers in Brazil

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The objectives of this research were to assess the prevalence and characteristics of actinic cheilitis (AC) in a cohort of sugarcane field workers working in a rural area of Brazil. The

whole population of workers received information about pathogenesis, risks, prevention, and treatment of AC.

A total of 199 individuals were working as sugarcane cutters at the plantation. A cohort of 165 individuals agreed with the informed consent was included in the research. The whole cohort was submitted to a comprehensive clinical examination to evaluate their oral health status and specifically to detect signs of AC. All patients received instructions regarding their oral care needs. Those that presented clinical signs of AC were biopsied. The biopsy site was chosen according to clinical features and with the aid of a clinical fluorescence device [VelScope®]. The sugarcane cutters had proper protective clothing but had no habit of using sunscreen. The cohort consisted of a male population, 35.9 years old average (21–52), and a median of 10.7 years in the labour (7 months to 20 years). Thirty subjects were clinically suspected of presenting AC and underwent biopsy. Twenty-six specimens confirmed the clinical diagnosis of AC with different dysplasia grades (15 mild, 9 moderate, 2 severe).

The high incidence of AC (15.07%) and the low average age of affected individuals, despite the use of protective clothing, led to the conclusion that chemical sunscreens are of great importance in preventing AC and that the individual's age is a less important factor in relation to the length of time of sunlight exposure. The relevance of this study lies in the collection of objective data regarding actinic cheilitis in the rural population of the country in order to allow the design of effective strategies in preventing this potentially malignant disease.

### B090

#### Association of polymorphisms of TLR2, TLR3, TLR4 and CD14 gene with the risk of oral lichen planus

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**Introduction:** Oral lichen planus (OLP) is T-cell mediated chronic inflammatory oral mucosal disease of unknown cause. Toll-like receptors (TLRs) play an essential role in the activation of innate immunity and they have been implicated increasingly in oral epithelial dysplasia and human carcinogenesis.

**Aim:** The aim of this study was to investigate the potential association between TLR2, TLR3, TLR4 and CD14 gene polymorphisms and risk of oral lichen planus (OLP).

**Material and methods:** The study group consisted of 101 patients with confirmed oral lichen planus and 104 healthy-blood donors without systemic and oral diseases. Polymorphisms were genotyped by Real-Time PCR or PCR-RFLP method. Wild type genotype for all studied polymorphisms used as a reference value in respect of which it assessed the risk for the development of OLP in the case of heterozygous and mutant genotype.

**Results:** Statistically significant reduction in risk for development of OLP is observed in the case of heterozygote (OR = 0.08, P = 0.008) and mutant (OR = 0.1, P = 0.029) genotype, rs3804099 polymorphism of TLR2 as compared to wild-type genotype. The dominant model of inheritance was statistically significantly associated with a reduced risk of OLP (OR = 0.09, P = 0.012). The mutant genotype was significantly associated with an increased risk for the development of OLP in relation to the wild type genotype rs5743312 polymorphism in the case of TLR3 gene (OR = 5.000, P = 0.044).

**Conclusion:** Predicted genetic model of inheritance is recessive. Heterozygous and mutated genotype combined had 15.6 times higher risk of developing OLP compared to the wild type genotype. Those polymorphisms could be considered as a potential molecular biomarker of importance for the development of OLP.

### B091

#### Notch act as cell differentiation factor in pleomorphic adenomas

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**Objectives:** Pleomorphic adenoma (PA) is the most common salivary gland tumor classified as benign epithelial tumors. Various cell types can be seen in the tumor indicating a high occurrence of cell differentiation. In this study, we focused on Notch expression in PA since it has been hypothesized to be strongly associated with neoplastic cell differentiation. Moreover, studies on the expression of Notch have been tremendously increasing.

**Methods:** The expression of Notch in 30 cases of pleomorphic adenoma was examined by immunohistochemistry.

**Results and discussion:** Comparing the results of our study with previous literatures, from the partial CK7 expression and substantial Notch expression in ductal epithelial cells as well as the Notch expression in solid tumor nests, it can be inferred that Notch is involved in cell differentiation. CK13 expression was observed in cells undergoing squamous metaplasia and Notch expression was seen in the nucleus of basal and squamous cells. The intense Notch expression in basal cells and weak expression in squamous cells

suggests that Notch is involved in the differentiation from basal to squamous cell. Moreover, the loss of nuclear expression on the inner layer would signify that differentiation is about to end or has been terminated. Notch was expressed in the cytoplasm of cartilage cells and in the cell membrane of mucous cells but not in the nucleus indicating that differentiation has been concluded.

**Conclusion:** Notch involvement is suspected in cell differentiation in areas showing ductal structures and squamous metaplasia. Nuclear expression was shown in tumor cells in solid nests and surrounding structures. Moreover, Notch is expressed by basal cells undergoing squamous metaplasia suggesting the participation of Notch in cell differentiation in PA.

**Relevance:** The results would help to further elucidate the role of these genes in PA and furthermore in salivary tumorigenesis.

### B092

#### Clinical-radiological correlation of Sjogren's syndrome suspected patients using Sialo-CBCT

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**Aim:** Sjögren Syndrome (SS) primarily manifests in ocular and oral dryness. Since no specific diagnostic marker is considered a gold standard, several criteria have been proposed over the years. The aims of this research were to characterize radiographic features of combined sialography and cone beam computerized tomography (Sialo-CBCT) in SS suspected patients and to correlate those features with the patient's clinical findings according to two SS classification criteria.

**Materials and methods:** SS suspected patients, referred for bilateral Parotid glands Sialo-CBCT during the years 2011–2014, were included in the study. The sialo-CBCT scans were separately reviewed by two observers for radiographic features such as: duct morphology, level of branching, structural damage and sialectasis. The glandular features were compared with the patient's clinical data according to two sets of criteria; The American-European Consensus (AEC) Group and the Sjögren International Collaborative Clinical Alliance (SICCA) Group.

**Results:** Sialo-CBCT scans were obtained retrospectively from 77 suspected SS patients (129 Glands). Differences in parameters were found between the left and right parotid glands. Association was found between structural damage and all other radiographic parameters, excluding duct features. Patient's with confirmed SS diagnosis using the AEC criteria showed strong correlation with specific radiographic features, whereas SS patients diagnosed according to SICCA criteria did not.

**Conclusion and relevance:** Sialo-CBCT is a promising new imaging tool which may allow better diagnosis and understanding of salivary glands impairment in SS. There is a clear variability between the two parotid glands scanned within the same patient therefore both glands should be simultaneously visualized. These differences indicate that salivary glands involvement in SS is a progressive and complex process. Further studies are needed to explore sialo-CBCT as a novel tool for diagnosing salivary glands impairment and its relevance to oral involvement and criteria in SS.

### B093

#### HPV for oral cancer screening need new test assessment and new nomenclature

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**Objectives:** The Head and Neck Squamous Cell Carcinoma (HNSCC) has a gradually increasing prevalence and it is actually the 5th leading cause of cancer by incidence in 50–60 year old men. The most important risk factors identified so far in men are tobacco and alcohol, but a new risk factor was recently attributed to the human papilloma virus (HPV). We investigated the presence of HPV DNA in oral cytological samples to understand the virus incidence, the genotype distribution and its association with HNSCC.

**Materials:** Oral mucosa from 36 apparently normal subjects (21 female and 15 male with median ages respectively of 60.5 and 54.1 years) was collected by cytobrush and analysed by liquid-based cytology. Cytological results are reported in another session of this Congress (Navone R. et al., 2016). HPV test was performed using a high sensitivity RDB test able to identify and genotype low and high grade HPV.

**Results:** 2/36 (5.5%) patients had HPV DNA in the oral mucosa. HPV was found only in female samples. We identified an high grade HPV in the first case and a coinfection of high and low grade HPV in the second one. Cytology detected normal mucosa in the first case and keratosis in the second one.

**Conclusions:** HPV becomes the main risk factor in those subjects where alcohol and tobacco are less representative. It is also important to choose the right HPV test: many HPV commercial kits are available, developed for endocervical carcinoma screening and thus limited to the high risk genotype search. Classification of high and low grade HPV genotypes is based on cervical cancer evidences but this nomenclature could be misleading in case of HNSCC. Further studies are needed to better understand the HPV distribution in oral mucosa and its involvement in cancer etiology.

#### B094

##### Evaluation of salivary amylase and pain levels in myofascial pain syndrome

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**Objectives:** The present study was planned to evaluate the level of salivary alpha-amylase (sAA) in healthy individuals and Myofascial pain syndrome (MPS) patients and to find the reliability of salivary alpha amylase as a biomarker for pain.

**Methods:** After obtaining institutional ethical approval, the study was divided into two groups viz group I with clinically diagnosed MPS patients (criteria by RDC) and age & sex matched control group. Both groups had 55 patients. Visual Analog scale (VAS) score for each individual was recorded and salivary sample for estimation of amylase was taken using NAVAZESH method.

Statistical analysis was done using SPSS software 16.0.

**Results:** The sAA was significantly higher amongst Group I ( $149.92 \pm 21.1$ ) compared to Group II ( $91.18 \pm 5.4$ ). The analysis of variance revealed that there was significant difference in VAS among different age groups and sex. The salivary alpha amylase levels progressively reduced in patients as the age increased. Multiple regression analyses revealed that there was significant positive correlation between VAS and sAA in Group I. However, mild negative correlation was found between VAS and sAA in Group II.

**Conclusion:** This is the first known study to date, to highlight the sensitivity of sAA as an effective marker in assessment of pain severity in MPDS patients on the basis of VAS scale. According to the results of the present study, the level of salivary alpha-amylase was significantly correlated with the pain severity assessed by VAS.

**Relevance:** Firstly the validity and reliability of saliva to be used as diagnostic fluid is confirmed. Secondly the correlation of the sAA and pain is established and it can be efficiently used as marker of pain.

#### B095

##### Effectiveness of topical dry mouth products reducing xerostomia in hemodialysis treatment

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**Objectives:** The purpose of this study was to evaluate the efficacy, in a group of haemodialysis (HD) patients, of a group of topical dry mouth products (toothpaste, mouth rinse, and mouth gel) containing betaine, aloe vera, xylitol and fluoride.

**Methods:** Twenty-five HD adults with dry mouth were included in this clinical study. A xerostomia questionnaire (visual analog scale (VAS)) and the Oral Health Impact Profile (OHIP)-14 were assessed. All measurements were taken at basal, 1 and 3 weeks after treatment. Subjects received topical dry mouth products for daily use up to 3 weeks. The patients in turn completed a treatment satisfaction questionnaire at the end.

**Results:** All patients (14 men and 11 women; mean age  $63.52 \pm 12.50$ ) completed the study. The topical dry mouth products alleviated the symptoms of xerostomia, with improvement in the VAS ( $P = 0.0001$ ) and OHIP-14 scores ( $P = 0.0001$ ). The scores of VAS (basal  $39.84 \pm 14.99$ ; 1 week  $30.68 \pm 11.12$ ; 3 week  $22.87 \pm 7.66$ ) and OHIP (basal  $16 \pm 13.09$ ; 1 week  $9.76 \pm 10.80$ ; 3 week  $2.84 \pm 5.20$ ) were greater in the first week than the third week after treatment. There were no adverse effects. Patients' satisfaction with the three dry mouth products was excellent.

**Conclusions:** The daily use of dry mouth substitutes with betaine, aloe vera, xylitol and fluoride were seen to improve xerostomia and quality of life in HD patients.

**Relevance:** It is important to treat xerostomia correctly in HD patients because dry mouth could increase interdialytic weight gain and reduce quality of life of these patients.

#### B096

##### Diagnostic cytopathology and DNA HPV testing for oral cancer screening

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**Objectives:** The survival rate for squamous cell carcinoma of the oral cavity (OSCC) remains low, as it is often diagnosed late due to no reliable diagnostic method of selecting people with high risk of transformation. Liquid based oral cytology alone can provide useful information about oncologically relevant morphologic alterations (sensitivity, specificity and positive predictive values have been reported to be 94.7%, 98.9% and 95.9% respectively in 411 patients) and gives good first level screening results (Navone R. et al. Liquid-based oral cytology and microhistology in Oral Cytology. A concise guide. Mehrotra R. ed, pp. 91–108, Springer, 2013). Moreover, a potential role of oral HPV infection in the onset of OSCC, hypothesized but still to be proved, could represent an adjunctive predictive factor.

**Methods:** We are currently screening apparently normal subjects with a first level method, i.e. liquid-based cytology combined with investigation with DNA-HPV test. Samples were obtained by the cytobrush on the most commonly involved sites for oral carcinoma (floor of the mouth, tongue, gums and cheek lining).

**Results:** Forty-seven subjects were enrolled: 39/47 had normal cytology results, 1/47 had a low- grade oral lesion (OIN 1) and 2/47 had HPV-DNA test positive.

**Conclusions:** Combining liquid based diagnostic oral cytology and tests for HPV infection seems able to select a subgroup of patients with potential predictive factors for OSCC development and thus requiring proper follow-up schedule even in absence of visible oral lesions.

**Relevance:** The prospective evaluation of healthy subjects with HPV infection could give important information about its role in the development of OSCC. In the case of a proven causal role of HPV, a combination of oral cytology and tests for HPV infection could represent a significant diagnostic step forward early diagnosis of OSCC, as yet demonstrated with the experience in uterine cervical carcinoma screening with PAP test and DNA-HPV.

#### B097

##### Contact sensitization to ingredients of both dental materials and cosmetics in dental students

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**Aim:** The aim of this study was to evaluate the rate of contact sensitization to selected cosmetic allergens, as well ingredients of dental materials in students of dental medicine and dental patients.

**Methods:** A total of 50 participants were included in the study: 40 students of dental medicine, exposed to the studied allergens during the course of practical education; 10 randomly selected dental patients without occupational exposure to the investigated substances served as a control group. All of them were patch-tested with colophonium, myroxylon pereirae resin, paraben mix, fragrance mix I, isopropyl myristate, triclosan, polysorbate 80, compositae mix II, and hydroperoxides of limonene.

**Results:** Highest were the sensitization rates for colophonium and polysorbate 80. For the group of dental students, we established significantly higher sensitization rate to colophonium, if compared to the ones to: myroxylon pereirae resin and hydroperoxides of limonene ( $\chi^2 = 4.93$ ;  $P = 0.026$ ), paraben mix ( $\chi^2 = 3.6$ ;  $P = 0.05$ ), isopropyl myristate ( $\chi^2 = 6.56$ ;  $P = 0.01$ ), and triclosan ( $\chi^2 = 8.5$ ;  $p$ )

**Conclusions:** Colophonium and polysorbate 80 could be outlined as sensitizers of paramount importance for both dental students and dental patients. We consider the major importance of exposure to colophonium during the course of practical education in dentistry for the onset of the sensitization. Sensitization to compositae mix was observed only among dental students. We consider the leading role of consumer exposure for the onset of the sensitization to triclosan and to hydroperoxides of limonene. Unexpected and unreported reactions of concomitant sensitization were observed.

**B098****High risk population for MRONJ onset: oral condition of oncologic and hematologic patients undergoing individual preventive program**

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**Background:** Antiresorptive agents such as bisphosphonates (BPs) effectively reduce skeletal-related events incidence in patients with metastatic bone cancer and multiple myeloma, thereby placing them at potential risk for developing Medical Related Osteonecrosis of the Jaw (MRONJ). Prevention of BPs side effects and MRONJ onset and progression is a challenge for medical team.

**Objective:** To evaluate the association between periodontal disease and MRONJ and to assess the impact of non surgical periodontal treatment on oral health in a population at risk for MRONJ onset.

**Methods:** In collaboration with the Hematology and Oncology Unit of the University Hospital of Ferrara, the Dental Unit developed a preventive program focused on primary prevention of MRONJ onset and developed minimally invasive protocol to manage signs and symptoms in all cases of MRONJ. All participants underwent complete oral and radiographical examination and clinical parameters records (PD, BoP, PII mobile dentures examination). Then all parameters were merged to assign each patient a comprehensive risk evaluation score for MRONJ, "HIGH" or "LOW" score.

**Results:** During 24 months observation time, 184 patients underwent complete oral examination and treatment at the Dental Unit. On average, patients received 9.7 drug treatment cycles (range 1–48). 115 patients, eligible for BPs and denosumab therapy (cohort 1), mean age of 67 years (range 33–92), received complete dental preventive treatments, including dental extraction. 69 patients, previously exposed to BPs and denosumab (cohort 2), mean age of 67 years (range 44–87), received only non surgical treatments. Individual risk for MRONJ was checked for each patient during first visit and after 3 months at least. It was observed a correlation between HIGHrisk and established MRONJ, with high sensibility (96%).

**Conclusion :** MRONJ is a clinically significant adverse effect of antiresorptive agents. A mandatory preventive program for oral health, involving a multidisciplinary team should be developed for all patients eligible for antiresorptive agents treatment.

**B099****Oral microhistology: an innovative technique for oral lesion diagnosis**

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**Objectives:** Unfortunately, the survival rate of squamous cell carcinoma of the oral cavity (OSCC) is still low, as diagnosis is often late and diagnostic tests able to identify early stages must be adopted. A definitive diagnosis of OSCC is based on scalpel biopsy, performed in specialised centres, but it is an invasive and expertise demanding test. First level tests designed for general dental practitioners (GDP), usually facing oral mucosal lesions in their clinical practice, could support the diagnosis of early oncologically relevant lesions. Oral diagnostic cytology alone, whilst providing useful information (sensitivity is higher than the Pap test, while specificity is similar), does not suffice for the diagnosis of all OSCC cases (Navone R et al, Curr Opin Otolaryngol Head Neck Surg 2011; 19: 77-81).

**Materials:** A non invasive and non expertise demanding tissue sampling technique has been recently developed (Navone R et al, J Oral Pathol Med 2008, 37: 358–63; Pentenero M et al, J Oral Pathol Med 2014, 43: 435-440). A clinical trial has been set-up involving GDP in performing sampling. A total of 56 GDP obtained samples using the curette technique. These were then treated for histological examination (paraffin inclusion, haematoxylin-eosin staining) as routine small biopsies.

**Results:** This first level test provided very good results even in less expert hands. Indeed, there were only 12/191 inadequate samples (6.1%), whilst 167/179 were negative, 9/179 (5.0%) low- grade dysplasia (OIN 1), 2/179 (1.1%) high-grade dysplasia (OIN 2-3) and were 1/179 (0.56%) OSCC.

**Conclusions and relevance:** The combined curette technique sampling and microhistology may well represent an effective first-level method to distinguish those reactive or inflammatory lesions requiring only follow-up, from precursor or positive lesions (dysplasia and OSCC) to be sent to the specialised second-level centres for routine scalpel biopsy.

**B100****Large screening about genetic predisposition to celiac disease and oral health**

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**Objectives:** To assess the prevalence of enamel defects and recurrent oral aphthous lesions in a large cohort of school children genetically predisposed (HLA DQ2+ and/or DQ8+) to celiac disease (CD) in comparison with healthy controls (not predisposed) and children with CD.

**Methods:** Students aged 5–10 years were enrolled in the study. A rapid, single PCR reaction HLA test (Celiac Gene Screen, Biodiogene Italy) on a single blood drop was used to identify subjects susceptible to CD (both HLA DQ2 and DQ8). In a second step serological tests were performed in HLA positive patients (including serum anti-transglutaminase (TTG), anti-endomysium (EMA) and anti deamidated gliadin peptides (DGP) antibodies). CD was diagnosed according to the ESPGHAN guidelines. An oral examination was performed in school settings, by the same examiner. Oral ulcerations (clinical and anamnestic), mucosal atrophy and enamel defects on permanent and deciduous teeth were assessed. HLA positive (group 1), HLA negative (group 2) and celiac subjects (group 3) were compared.

**Results:** 1,200 children have been enrolled and 1,189 have been HLA screened so far (mean age: 8.06 ± 1.58 years). 468 patients were HLA positive (40.06 %), of these 362 underwent the serological evaluation. CD autoimmunity was found in 20 patients with 10 receiving a final diagnosis of CD. No statistical difference was found in the prevalence of reported oral aphthosis. The prevalence of enamel defects was similar in the 3 groups (group 1: 13.4%, group 2: 13.1%, group 3: 18%), with no difference in the severity of enamel hypoplasia. No cases of oral mucosal atrophy were detected.

**Conclusions:** Preliminary data show that genes predisposing to CD (HLA DQ2/DQ8) do not seem to be associated with susceptibility to recurrent oral aphthous lesions or enamel defect prevalence.

**Relevance:** Young subjects genetically predisposed to CD do not require dedicated oral interventions.

**B101****Vermilionectomy and clinicopathologic profile in Actinic Cheilitis – 102 cases**

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**Objectives:** Related the casuistic of Actinic Cheilitis (AC) treated by vermilionectomy, its clinic pathologic profile and association with degree of dysplasia in an Oral Medicine Service.

**Methods:** Between January 2006 and August 2015 the total number of patients treated for AC with surgery in the oral medicine ambulatory of School & Hospital of Medicine, São Paulo State University-UNESP, Botucatu, Brazil were raised. The clinic pathologic profile and association with degree of epithelial dysplasia of AC were evaluated.

**Results:** The total of 253 surgical treatments of AC were realized, 47 female and 206 male, median age 60.53 years. The histopathological analyses showed: 0.79% basal cell carcinoma associated with moderate and severe dysplasia, 10.28% squamous cell carcinoma (SCC); AC presented 34.39% no epithelial dysplasia, 16.20% mild dysplasia, 22.92% moderate dysplasia, 13.44% severe dysplasia and 1.98% AC ulcerated. Vermilionectomy corresponded to 102 (40.32%) of surgical AC cases, 15 female and 87 male, mean age 59 years; the histopathology revealed: 14.71% SCC, 85.29% of the AC presented 37.25% no epithelial dysplasia, 34.32% moderate, and 13.73% severe epithelial dysplasia.

**Conclusions:** The histological changes of the AC are not distributed equally by the lip vermilion, even where the clinical characteristics are homogeneous. Our study shows that most of the lesions diagnosed clinically as AC, histologically revealed SSC and AC presented moderate and severe epithelial dysplasia, and ulceration, which have a high malignant potential.

**Relevance :** AC is a pre-invasive, malignant lesion localized principally on the lower lip vermilion, which has the potential to develop into SCC. The advantage of vermilionectomy is the complete removal of the epithelium altered, allowing histopathological review of all tissue removed, compared with others treatments for AC, the postoperative with few symptoms and rapid healing process.

**B102****Topical photodynamic therapy in oral verrucous hyperplasia: a systematic review**C Moreschi<sup>1</sup>, MG Grusovin<sup>2</sup>, N Cefis<sup>1</sup>, P Capparè<sup>2</sup>, S Abati<sup>3</sup>, G Gastaldi<sup>1,2</sup>, EF Gherlone<sup>2</sup><sup>1</sup>Dentistry and Oral Maxillofacial Surgery Unit, San Rocco Hospital, Brescia, Italy,<sup>2</sup>Department of Dentistry, Vita Salute University, San Raffaele Hospital, Milan, Italy,<sup>3</sup>Unit of DH Oral Diagnosis, SS. Paolo and Carlo University Hospital of Milan, Italy**Objectives:** The aim of the review was to assess the effectiveness of topical photodynamic therapy with 5-ALA in oral verrucous hyperplasia.**Material and methods :** Inclusion criteria were: topical photodynamic therapy with 5-ALA in oral verrucous hyperplasia should be used, according with Tsai protocol (635 nm laser light or LED red light at 635 nm used once a week, five 3-min and one 100-seconds irradiations, separated by five 3-min rests for a total of 1,000 seconds; fluence rate: 100mW7 cm<sup>2</sup> ;light exposure dose, 100 J cm<sup>-2</sup>),with 5-ALA (20% ALA gel form) as photosensitizer. The healing of the lesion should be reported; a minimum of 5-months follow-up, published in English. Outcome measure were: complete response (CR), partial response (PR), no response (NR) measured clinically. Medline, Embase were searched from December 1998 to December 2015 and handsearching was performed. The PRISMA statement for improving the quality of systematic review was followed.**Results :** Of the six potentially eligible studies, we included four studies. Two studies were excluded because the lesions treated were included in further studies. The healing of the lesion was: 100% CR.**Conclusions :** Within the limitation of the present systematic review the analysis of the clinical data of the selected studies suggests that 5-ALA PDT is very effective in the treatment of oral verrucous hyperplasia. This could be due to the epithelial structure of the lesions. Further studies have to be conducted to confirm this data.**Relevance :** in the clinical practice, topical PDT, with 5-ALA, could be used as a treatment for oral verrucous hyperplasia, as alternative to surgery.**B103****Distribution of prosthesis-related oral mucosal lesions**

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**Background:** Oral lesions in prosthesis wearers, even fixed or removable, constitute a heterogeneous group of tissue changes, both with regard to pathogenesis, clinical and histopathological appearance. Prosthesis may be the direct cause of these conditions, due to changing environmental conditions of the oral cavity. The aim of this study was to determine the distribution of oral mucosal lesions among prosthesis wearers attending to the Department of Oral and Maxillofacial Surgery, Faculty of Dentistry, University of Istanbul.**Materials and method:** Dental records of 582 prosthesis-wearing patients, who attended our clinic with the complaint of oral mucosal lesions, in the period between January 2014 and February 2016, were retrospectively reviewed for prosthesis-related oral mucosal lesions (PROMLs). Patients who had full-filled questionnaire form which included the following variables: Patient's personal data (name, age, gender, medical history), type of prosthesis worn, period of using that prosthesis, type and material of prosthesis, and diagnosed oral mucosal lesions were included in the study. Data collected were analyzed using the SPSS program.**Results:** Of the 582 patients, 14.26% had only complete-removable denture prosthesis (CRDP), 28.35% had only fixed prosthesis (FP), 9.62% had only partial-removable denture prosthesis (PRDP) and 47.77% had CRD/PRD/Fixed prostheses. Oral lichenoid reactions were the most common type of lesion detected, followed by fibroma, oral ulcers and oral cancer in fixed prosthesis wearers. Candidiasis was the most common type of lesion detected and followed by denture stomatitis, epithelial hyperplasia, angular cheilitis and oral cancer in complete and/or partial denture wearers.**Conclusion:** The distribution of PROMLs in our study group seems to be comparable to those in other studies. The type of PROMLs were found different in FP wearers and CRDP-PRDP wearers. Our results emphasize that denture wearing even fixed or removable have some relationship with the presence of oral mucosal lesions.**B104****Correlation between salivary markers of oxidative stress in chronic periodontitis**I Olszewska-Czyz<sup>1</sup>, D Pawlica-Gosiewska<sup>2</sup>, K Gawlik<sup>2</sup>, D Darczuk<sup>1</sup>, B Solnica<sup>2</sup>, M Chomyszyn-Gajewska<sup>1</sup><sup>1</sup>Department of Periodontology and Oral Medicine, Jagiellonian University, Krakow, Poland,<sup>2</sup>Department of Clinical Biochemistry, Jagiellonian University, Krakow, Poland**Introduction:** Clinical studies have shown an association with periodontitis and salivary markers of oxidative stress. This association is currently limited to the population level and none of the widely used markers can be applied for individual diagnostics.

Interventional studies indicate that antioxidant treatment could prevent or slow-down the progress of periodontitis.

The aim of the study was to evaluate the correlation between salivary markers of oxidative stress among patients suffering from Chronic Periodontitis and indicate the main antioxidants.

**Materials and method:** In the saliva of 18 patients with Chronic Periodontitis the total ferric reducing ability of plasma (FRAP), concentration of uric acid, concentration of total glutathione and activity of glutathione reductase were measured.**Results:** There was a strong correlation between the concentration of uric acid, FRAP-a level ( $r = 0.96$ ,  $P < 0.001$ ) and glutathione concentration ( $r = 0.80$ ,  $P = 0.003$ ). Similar correlation was observed between FRAP and glutathione level ( $r = 0.74$ ,  $P < 0.01$ ). Activity of glutathione reductase correlated only with the glutathione concentration ( $r = 0.71$ ,  $P = 0.013$ ).**Conclusions:** Obtained results revealed strong correlation between glutathione and antioxidant defense parameters, small molecules like FRAP and uric acid and enzymatic like activity of glutathione reductase. High correlation between FRAP and uric acid may suggest that the uric acid is the main small molecule antioxidant in the saliva of patients suffering from Chronic Periodontitis. Due to the small sample, the results should be treated as initial.**B105****Role of TLR4 and host-microbial interactions in OLP pathogenesis and lichen-related OSCC**G Pannone<sup>1</sup>, A Santoro<sup>1</sup>, R Ninivaggi<sup>2</sup>, M Petrucci<sup>2</sup>, R Leonardi<sup>3</sup>, G Campisi<sup>4</sup>,G Colella<sup>5</sup>, L Lo Muzio<sup>6</sup>, P Bufo<sup>1</sup><sup>1</sup>Department of Clinical and Experimental Medicine, Institute of Pathological Anatomy,University of Foggia, Foggia, Italy, <sup>2</sup>Department of Odontostomatology and Surgery,University of Bari, Italy, <sup>3</sup>Department Medical-Surgical Specialities, Section of OralMedicine, Policlinico, University of Catania, Catania, Italy, <sup>4</sup>Department of Surgical,Oncologic and Stomatologic Disciplines, University of Palermo, Italy, <sup>5</sup>Department of

Neurosciences and Reproductive and Odontostomatological Sciences, University of Napoli

Federico II, Napoli, Italy, <sup>6</sup>Department of Clinical and Experimental Medicine, Section of Oral Pathology, University of Foggia, Foggia, Italy**Objectives:** Oral lichen planus (OLP) is a mucocutaneous chronic inflammatory condition mediated by a complex signalling network between keratinocytes and sub-epithelial lymphocytes.

Moreover, OLP occurs in constantly renewing epithelium continuously exposed to commensals. Also oral squamous cell carcinoma (OSCC) is associated to a particular inflammatory microenvironment. Epithelium-specific signals can activate the inflammatory process via Toll-like Receptors (TLRs), a family of receptors expressed in B-lymphocytes, monocytes and epithelial cells. Up to now 13 TLRs have been identified including Toll-like receptor 4 (TLR4), with a particular ability to respond to most oral commensal microorganisms. The aim of the study was to evaluate the expression of TLR4 in OLP and in OSCC both associated or not to OLP.

**Methods:** We have analysed 19 cases of mucocutaneous OLP, 10 cases of OLP-associated OSCC, 53 cases of OSCC not related to OLP, and 67 cases of mucosa surrounding OSCC not related to OLP. Expression of TLR4 was determined by immunohistochemistry with LSAB-HRP technique.**Results:** TLR4 was moderately expressed in oral mucosa surrounding OSCC (mean: 28.5) and showed higher level of expression in OSCC not related to OLP (mean: 70.6). OLP revealed elevated TLR4 expression in the affected epithelium (mean: 54.8) and a consequent strong up-regulation in related OSCCs (mean: 83.5). These differences were statistically significant ( $P < .001$ ).**Conclusions:** In this study we demonstrated two strong associations: the first between TLR4 up-regulation and lichen; the second between TLR4 over-expression and OLP associated OSCCs.**Relevance:** Collectively, our data support a critical role for the host-microbial interactions and TLR4 in OLP pathogenesis and lichen-related oral carcinogenesis.**B106****Evaluation of blood mercury levels in dental students and dental professionals**V Panov<sup>1</sup>, M Markova<sup>1</sup>, A Krasteva<sup>2</sup>, A Kisselova<sup>2</sup>, M Lyapina<sup>3</sup><sup>1</sup>Department of Conservative Dentistry and Oral Pathology, Faculty of Dental Medicine,Medical University, Varna, Bulgaria, <sup>2</sup>Department of Imaging and Oral Diagnostics,Faculty of Dental Medicine, Medical University, Sofia, Bulgaria, <sup>3</sup>Department of Hygiene,

Medical Ecology and Nutrition, Medical Faculty, Medical University, Sofia, Bulgaria

For more than 200 years dental amalgam has been a reliable restorative material because of its durability, longevity, effortless handling and low cost. The World Health Organization states that there is no safe mercury level, meaning that no amount of mercury, not even one atom is safe. It's a scientific fact that mercury is continuously being released



from amalgam fillings, and 80% of it enters the body and accumulates. About 50% of Bulgarian patients have amalgam fillings.

**Objective:** To determine blood mercury levels in dental students from the 3rd course and in dental professionals, occupationally exposed for more than 3 years.

**Methods:** Thirty-eight dental students and 10 dental professionals were included in the study, and 71 individuals served as a control group.

**Results:** Blood levels of mercury above the normal values were observed in 30% from the group of dental professionals, in 5.26% from the group of dental students and in 7.04% from the control group.

**Conclusion:** Basing on our results, dental professional could be outlined as a group at risk for increased blood mercury levels in occupational exposure to dental amalgam.

## B107

### Use of teledentistry in oral medicine: a pilot study

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**Objective:** To validate a Teledentistry network based on "hub & spoke" system where the hub (Oral Medicine center) receives data and information from/to the spoke (e.g. oncologic Unit) in order to perform a "real-time consultation" for oral diseases assessment.

**Methods & Materials:** The Experimental Spoke was equipped with a PC workstation, connected through a "Virtual Private Network" (VPN) with the Hub (Sector of Oral Medicine "V. Margiotta") and with an intra-oral camera aimed to work in the oral environment. This device has an optics designed for the macro photography with an antifog lens that avoids the creation of condensation on the surface. During 6 months of experimentation, cancer patients with suspected oral diseases were consecutively recruited and underwent an oral examination by trained medical personnel under "real-time" directions of the hub specialists. Informed consent was obtained from all participants. If necessary, the suspected diagnosis were then confirmed and managed directly at the hub.

**Results:** Fifteen patients needing an oral medicine assessment were selected. By "real-time" tele-visit it was possible to evaluate that two patients required urgent oral medicine management: one for suspected erythroplakia and one for suspected GVHD (graft versus host disease). For these, the histological confirmation (in the first case with a definitive diagnosis of "carcinoma in situ") was performed at the hub within 3 weeks from the tele-visit. In addition six patients (40%) had moderate and severe oral mucositis and had received an appropriate management in the same day of tele-visit. Among the remaining patients, four had been referred to the hub for no urgent assessment (3 fibromas, 1 mucocele) and three did not require any treatment (frictional keratosis).

**Conclusions and relevance:** This study demonstrates that this specialized network can offer to a distant oncological center the opportunity to have an immediate and efficient help for the assessment of oral diseases.

## B108

### Oral lichen planus and dental metals allergy

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**Introduction:** As current research indicates that dental alloys may play a role in the autoimmune diseases by metal release which can be the an unidentified triggering OLP antigen, we aim to identify an association between oral lichen planus (OLP) and dental alloys allergies and to determine the clinical features of these patients.

**Methods:** The study was carried out in the Clinical Department of Oral Medicine Discipline, Faculty of Dental Medicine, Bucharest between 2014-2016. A total of 20 OLP patients, mean age 60.45 years who presented metallic dental-fixed prosthetics were investigated. The OLP was diagnosed by clinical and histological criteria. Patch testing for dental allergens including dental alloys was performed in a Dermatology clinic.

**Results:** In the studied group, 15 cases (75%) had positive patch test reaction to at least one allergen, 9 (45%) of them were positive to Sodium tetrachloropalladate (II) hydrate. 5(25%) patients were positive to Cobalt(II) chloride hexahydrate 3 to Potassium dichromate. The patients were mainly women (86.66%). The clinical forms of OLP were variable: 7 patients (46.66%) had asymptomatic, white lesions, 5 cases (33%) had mild symptoms and presented associated white and atrophic oral lesions. After a mean follow-up period of 8 months lesions remitted in 3 cases after removal of the dental-fixed prosthesis but as most of the patients did not removed the appliances, no significant clinical improvement was noticed in most of the cases. This work was supported by Romanian UEFISCDI, Project PCE no. 130/2014.

**Conclusions:** The prevalence of metal allergies in the current study is relatively high and the removal of metallic dental-fixed prosthetics in 3 positive allergic patients led to the remission of the lesions.

**Relevance:** Removal of dental metallic fixed prosthetics in OLP patients brings a beneficial effect on oral lesions in positive allergic patients.

## B109

### Immune response in oncologic patients with oral mucositis undergoing laser-therapy

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**Objectives:** Laser therapy is able to induce wound healing, to promote epithelial repair, to reduce pain, to decrement inflammatory processes and bacterial infections, resulting in the reduction of oral mucositis severity. This project has inquired the effect of laser therapy in oncologic adult patients, affected by oral mucositis, on cytokines, immunity molecules, and antimicrobial peptides production.

**Methods:** A total of 15 oncologic patients submitted to radiotherapy for head and neck tumors, chemotherapy and/or hematopoietic stem-cell transplant, affected by oral mucositis, have been visited at the Oral Medicine and Pathology Unit of "Ospedale Maggiore" in Trieste (Italy). Saliva and buccal swabs have been collected and stored at -80°C. Swabs were harvested both in areas affected by lesions, as well as on healthy tissue. Patients were treated with laser therapy at days 0, 1, 2, and 3 according to already optimized protocols [Ottaviani G et al. Am J Pathol 2013 Dec; 183(6):1747-57]; saliva was collected without stimulation for 5 min before and after each laser therapy and at day 4. We evaluated a complete panel of cytokines involved in the immune response before and after laser therapy. Moreover, we assessed the oral microbiome and correlated it with the cytokines' expression.

**Results:** Increased immune mediator concentrations were recorded for MIF and NGF-β. On the contrary, IL-8 and IL-2 decreased in the affected areas, whereas in healthy tissues LIF and IL-16, cytokines related to inflammation, lowered their concentration. Alfa- and Beta-Defensin, antimicrobial molecules, increased their expression in oral mucosa after laser exposure.

**Conclusion:** Laser therapy is able to modify the innate immune response, particularly enhancing the expression of anti-inflammatory cytokines and of antimicrobial peptides.

**Relevance:** Changes in concentrations of these molecules related to innate immune system allow to better resolve oral ulcerations, thus stimulating tissue repair and enhancing the immune response against opportunistic infections within oral mucosa.

## B110

### Assessment of HPV screening methods in oral lichen planus lesions

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**Objectives:** HPV DNA has been found in OLP lesions, with most of the studies conducted in tissue specimens, limiting the broad applicability for screening purposes. We investigated the HPV DNA distribution in OLP samples using different non-invasive method, with the potential for much broader population screening.

**Methods:** Three different non-invasive collection methods (dry storage, lysis buffer preservation, use of a commercial tool to rake epithelial cells and immersion of the collection device into the provided rinse solution) were evaluated and samples were obtained by brushing or scraping the lesion site. HPV DNA was detected in brushed or scraped samples by using a commercial HPV DNA PCR kit.

**Results:** HPV DNA was detected in 12.85 % of the samples preserved in lysis buffer (3 cases with HPV low risk band, 2 cases with HPV-16, 2 cases with HPV high risk band, 1 case with HPV-18, 1 case with HPV-poly band). HPV DNA was detected in 34.28 % of samples preserved in the DNA•SAL™ rinse solution (7 cases with HPV-16, 6 cases with HPV-18, 5 cases with HPV high risk band, 5 cases with HPV low risk band, 1 case with HPV-poly band), and in the case of dry storage HPV DNA was detected in 38.57% of samples (8 cases with HPV-16, 7 cases with HPV-18, 6 cases with HPV low risk band, 5 cases with HPV high risk band, 1 case with HPV-poly band). Between the sample preservation methods of dry storage and DNA•SAL™ collection, no statistically significant difference was observed.

**Conclusions:** The results suggest that the most effective sample preservation methods are provided by dry storage and DNA•SAL™ collection.

**Relevance:** Our findings indicated that HPV DNA detection in superficial OLP scrapings has potential as a screening tool, and has important applications for both research and clinical practice.

## B111

**Desquamative gingivitis as the only sign of autoimmune diseases**C Tofan<sup>1</sup>, I Parlatescu<sup>1</sup>, C Gheorghe<sup>1</sup>, L Mihai<sup>2</sup>, S Tovu<sup>1</sup><sup>1</sup>*Discipline of Oral Medicine, Dental Medicine Faculty, University of Medicine and Pharmacy Carol Davila, Bucharest, <sup>2</sup>Discipline of Oral Medicine, University of Medicine Titu Maiorescu, Bucharest, Romania*

**Introduction:** Desquamative gingivitis describes the gingival involvement of some autoimmune diseases such as oral lichen planus (OLP) or autoimmune blistering diseases. Clinically it is characterized by white lesions, atrophy, erosions, bullae and ulcers. Symptoms vary from mild discomfort to severe pain. We included in our study 1,440 OLP patients and 51 with autoimmune blistering diseases. The inclusion criteria was the presence of gingival involvement and diagnosis confirmation by clinical means and/or histology for OLP and clinical signs, histology and direct immunofluorescence for oral blistering diseases.

**Case details:** In 24 cases of OLP and 6 cases of oral blistering diseases the gingiva was the only site of involvement, presenting desquamative gingivitis. The OLP group had the mean age 58. Three of these cases associated cutaneous lesions. The most frequent clinical gingival sign was mucosal atrophy, followed by white lesions. The lesions were mostly asymptomatic, patients reported mild discomfort while consuming spicy food and carbonated drinks. In the blistering diseases group (5 pemphigoid and 1 pemphigus vulgaris) the mean age was 66 and 57% were women. No cutaneous lesions were reported on the onset. The most frequent clinical appearance was mucosal atrophy, followed by ulcers.

**Conclusion:** Desquamative gingivitis as the only clinical sign was reported in 30 cases of autoimmune diseases (2%). In 21 cases of OLP no other oral or cutaneous lesions were reported for 1 year. The oral lesions present at the onset of the blistering disorders were followed by cutaneous lesions in a period variable from 3 to 6 months.

**Relevance:** Desquamative gingivitis as the only clinical sign was scarcely encountered in the autoimmune diseases cases, imposing special attention in order to correctly diagnose the underlying disease and initiate treatment as soon as possible, not only preventing complications but improving life quality.

## B112

**Oral manifestation of nutritional deficiencies – single center analysis**V Radochová<sup>1</sup>, R Slezák<sup>1</sup>, J Radocha<sup>2</sup><sup>1</sup>*Department of Dentistry, Faculty of Medicine and University Hospital in Hradec Králové, Charles University, Czech Republic, <sup>2</sup>4th Department of Internal Medicine, Haematology, Faculty of Medicine and University Hospital in Hradec Králové, Charles University, Czech Republic*

**Background:** Oral manifestations of deficiency of iron, vitamin B12 and folic acid are considered as common. However the prevalence of these deficiencies among patients presenting with compatible symptoms is not well known.

**Aim:** The goal of this analysis is to estimate the prevalence of iron, vitamin B12 and folic acid deficiency amongst patients with burning mouth and other compatible symptoms.

**Methods:** We retrospectively analyzed data from patients who were examined for the following symptoms: burning mouth, angular cheilitis, recurrent aphthae, papillar atrophy of the tongue and mucosal erythema. All patients underwent clinical examination and the blood samples were taken for ferritin, vitamin B12, folic acid levels and complete blood count as per institutional standards.

**Results:** A total of 204 patients (35 males, 169 females, mean age 46.1 years) with at least one corresponding symptom or sign were identified. 88 patients (43.1%) had a deficiency. 57 patients (27.9%) had iron deficiency, 33 patients (16.2%) had vitamin B12 deficiency, 9 patients (4.4%) had folic acid deficiency and 10 patients (4.9%) had combined deficiency. The most frequent symptom was burning mouth, present in 104 patients (51%). The most sensitive signs for prediction of deficiency were mucosal erythema, papillar atrophy and combination of burning mouth, erythema and papillar atrophy (70.3%, 72.2% and 100% of patients had deficiency when present).

**Conclusion:** Nutritional deficiencies are common among patients with corresponding symptoms. Oral symptoms may represent the first presentation of the underlying deficiencies. Patients presenting with objective oral signs are most likely to have underlying deficiency.

Supported by PRVOUK P37/13 and P37/8.

## B113

**Knowledge assessment about oral premalignant and malignant lesions among students**G Reisdorfer Galina, G Begnini, AF Giovanini, JF Souza, MR Araujo, F Baratto-Fillho *Universidade Positivo, Brasil*

**Objective:** Evaluate the knowledge of students regarding the diagnosis and risk factors for oral premalignant (OPL) and malignant lesions (OML).

**Methods:** A structured, pre-tested, self-report and validated questionnaire of 19 questions was used to collect data among 640 students from two universities in Brazil. The survey included questions on socio-demographic data, individual self-assessment awareness and knowledge of OPL and OML. Data were analyzed comparing students who have already attended the Oral Medicine discipline (OM) and those who have not. Qualitative data were shown as percent, frequency distributions and chi-square tests were performed using SPSS 20.0.

**Results:** The majority of respondents were females (3:1), mean age was 22 years ( $\pm$  4.8) ranged from 17 to 49; 45% have attended OM and their self-reported knowledge was good. Leukoplakia was the most pointed OPL (74% who have attended OM, 67% have not). Painless and hard board were the most suspicious of malignancy (75% and 52%), Squamous cell carcinoma was the most common histological type (74% and 59%). Painless ulcer was the most reported clinical appearance of OML (55% for who have attended OM) whereas hard nodule (52%) for who have not. The tongue was not recognized as the most common site of OML for both respondents ( $P = 0.017$ ). Age and sex had no correlation with knowledge; however attendance to OM improved it. A satisfactory knowledge was observed on risk factors: smoking (97.2%) alcohol (84.5%) and solar radiation (80%) in who have attended OM, however only smoking (85.5%) for who have not. Unsatisfactory knowledge was observed about HPV (48.5%), dietary factor (3.84%) in who have attended OM.

**Conclusions:** The overall knowledge of OPL and OML is satisfactory in those have attended OM, however there is a need to emphasize risk factors.

**Relevance:** Oral cancer is a health concern. Recognizing risk factors and early diagnosis is very important for students and dentists.

## B114

**Salivary cytokines' profile in psoriatic and periodontitis patients before and after treatment**A Santarelli<sup>1</sup>, M Mascitti<sup>1</sup>, A Campanati<sup>2</sup>, AM Offidani<sup>2</sup>, G Campisi<sup>3</sup>, O Di Fedè<sup>3</sup>, L Lo Muzio<sup>4</sup>, G Ganzetti<sup>2</sup><sup>1</sup>*Department of Clinical Specialistic and Stomatological Sciences, Polytechnic University of Marche Region, <sup>2</sup>Clinic of Dermatology, Polytechnic University of Marche Region, <sup>3</sup>Department of Surgical, Oncologic and Stomatologic Disciplines, University of Palermo, <sup>4</sup>Department of Clinical and Experimental Medicine, University of Foggia, Italy*

**Objectives:** Recent data have emphasized that periodontal disease seems to be more common in psoriatic patients compared to general population and an increased risk of psoriasis has been detected in patients with chronic periodontitis.

The aim of the present study was to evaluate the modification of pro-inflammatory cytokines in saliva of psoriatic patients before and after conventional or biologic treatments.

**Methods:** Sixty-three psoriatic patients suffering from stable moderate to severe psoriasis have been recruited. An oral disease assessment and a salivary sample have been performed both at baseline (T0) and after 24 weeks of systemic treatments (TNF- $\alpha$  inhibitors or cyclosporine).

**Results:** At baseline, a higher prevalence of diffuse gingivitis and periodontitis have been detected in psoriatic group than in healthy subjects. After 24 weeks of TNF- $\alpha$  inhibitors or cyclosporine, salivary IL-1 $\beta$  showed a statistically significant reduction in all treated patients compared to T0; despite decreased, its immunoassorbance appeared higher than healthy controls. A similar trend was recorded for TGF- $\beta$ 1 after TNF- $\alpha$  inhibitors.

**Conclusions:** Psoriatic patients, independently from the presence of periodontal disease, show a higher expression of pro-inflammatory cytokines. Moreover, TNF- $\alpha$  inhibitors seem to reduce salivary inflammatory process.

**Relevance:** An oral cavity examination may be useful in psoriatic patients to reduce the underestimation of oral involvement in psoriasis emphasizing inflammatory pathological conditions, which could trigger psoriasis itself.

## B115

**Oral leukoplakia: a clinicopathological analysis of 127 patients**

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**Objectives:** The aim of the present study is to report a clinicopathological evaluation of 127 patients with oral leukoplakia with emphasis on the therapeutical approaches (e.g.

medical therapy, traditional, laser and quantic molecular resonance scalpel surgery) as well as on the cancerization rate.

**Methods:** Files from patients with a presumptive diagnosis of oral leukoplakia treated at the Center of Oral Pathology and Oral Surgery of the University of Parma, between 1996 and 2012, were retrieved and analyzed. Only cases with histopathological evaluation were further selected. Dysplasia grading was available for all lesions. One hundred and twenty seven patients (69 females – 54.3%; 58 males – 45.7%, mean age 57.7 years) were included. Every lesion was singularly evaluated with regard to the treatment approach, taking into account the outcome and the follow-up.

**Results:** Two hundred and eighty five lesions (137 homogeneous – 148 non-homogeneous) were identified. Among these, 60 (21%) were localized on the upper gingiva, 51 (18%) on the lower gingiva, 6 (2%) on the dorsal surface of the tongue, 34 (12%) on the lateral borders of the tongue, 12 (4%) on the ventral part of the tongue, the rest variously affecting the cheek mucosa, the hard and the soft palate and the lower lip. Mean follow-up was 24.52 months.

Seven out of 65 (10%) lesions in the group of lesions approached through a “wait and see” policy underwent malignant transformation. Three out of 67 (4.5%) in the group of lesions treated with a medical approach developed an oral carcinoma. Among 72 lesions treated with a surgical approach only 1 (1.4%) transformed into a carcinoma.

**Conclusions:** Surgical approach with Er:Yag laser seems the best approach for treating oral leukoplakia. Seven out of 127 (5.5%) patients developed a carcinoma.

## B116

### Oral involvement in patients with primary Sjögren syndrome.

#### EpoX-SSp project

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**Objectives:** The aim of this preliminary study is to evaluate the characteristics, especially oral signs and symptoms, in a group patients with primary Sjögren syndrome (PSS), and to assess their quality of life.

**Methods:** This study was performed on a group of 23 PSS patients (all of them women, mean age 55.91 ± 13.44) referred from all the public funded rheumatology centers of Madrid. Data was collected using a questionnaire containing demographic and clinical variables, a visual analogue scale (VAS) for xerostomia, and oral health impact profile (OHIP-14) questionnaire. Unstimulated whole saliva (UWS) and stimulated whole saliva (SWS) were collected.

**Results:** 17 PSS patients (73.9%) were diagnosed according to the American-European PSS criteria. UWS and SWS were not done on PSS patients previously. 3 new PSS patients (13%) were diagnosed correctly, according to American-European PSS criteria, with a sialometry. Of total PSS group, 91.3% suffered dry mouth, 43.5% glossodynia, 47.8% dysphagia, and 34.8% dysgeusia. The mean xerostomia VAS and OHIP-14 scores were 47.52 ± 11.12 and 34 ± 11.29, respectively. Mean UWS and SWS were of 0.11 ± 0.15 and 0.86 ± 0.84, respectively. Decreased values of UWS and SWS were reported in 52.2% and 47.8% of patients. There was no relationship between the volume and decreased values of UWS, SWS, and xerostomia.

**Conclusions:** Dry mouth is a very frequent problem in PSS patients. According to this study, only 50% of PSS suffered from hyposialia, and there was not a significant correlation between xerostomia and hyposialia. It is important to have a close relationship between the dentist and the rheumatologist in order to make an early and correct PSS diagnosis.

**Relevance:** It is particularly important to carry out sialometry tests, in order to reach a much larger number, and correctly diagnose PSS patients. Since their patients' quality of life related to oral health was very poor.

## B117

### Specific expression profile of miRNA in the oral lichenoid disease

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**Objectives:** Dissect the aberrant microRNA profile of oral lichenoid disease (OLD) and defined that biological processes associated with the deregulated microRNAs in OLD.

**Materials and methods:** MicroRNA expression profiles were assessed using TLDA card in 24 samples (16 OLD, and 8 control). The findings were validated using RT-qPCR in an independent cohort of 36 OLD and 27 controls. A gene ontology analysis was performed based on the validated gene targets of the differentially regulated microRNAs.

**Results:** We identified 20 differentially expressed microRNAs of which several are functionally related to immune processes. Further validation of the top ranked microRNAs in an independent cohort of OLD, and control samples, revealed that they were all aberrantly expressed in OLD lesions.

**Conclusion:** We have identified a new microRNA signature associated with OLD that may provide a meaningful basis for better understanding the physiopathology of the disease. Furthermore, it seems that the microRNA expression profile associated with OLD reflects a clear immune component of the disease.

**Relevance:** Our findings are based in the largest set of OLD samples that had ever been used in the study of the aberrant microRNA profile of OLD disease and a selected subset of miRNA markers has been successfully validated in an independent set of 63 samples. These new insights could open new avenues to better understand the etiology of OLD, as well as aiding the diagnosis and treatment of this disease.

**Acknowledgements:** The research is supported by a grant from Carlos III Health Institute (FIS\_PI13/01211). Technical and human support provided by SGiker (UPV/EHU, MINECO, GV/EJ, ERDF and ESF) is gratefully acknowledged.

## B118

### Small proline-rich proteins in keratocystic odontogenic tumor

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**Objectives:** Parakeratosis is a characteristic feature of keratocystic odontogenic tumor (KCOT). Small proline-rich proteins (SPRs) are important substances for keratinization. Their cytoplasmic expression in spinous layer is essential to formation of cutaneous orthokeratinized layer.

Therefore, we investigated the localization of SPR-family in KCOT.

**Methods:** We selected 20 cases of KCOTs from the archives of the Laboratory of Surgical pathology at Matsumoto Dental University Hospital. The specimens of gingival mucosa without inflammatory and atypical changes were served as controls. SPR1b, SPR2 and SPR3 were immunohistochemically analyzed using an amino-acid polymer method.

**Results:** The parakeratinized and upper spinous layers, or approximately the upper one-third of epithelium of KCOTs showed cytoplasmic positive reactions against the SPR1b-antibody. SPR2 and SPR3 were localized in the only superficial part of the epithelium of KCOTs. In control specimens, the upper one or two-third of the spinous layer was positive for all SPRs but the parakeratinized layer were negative.

**Conclusions:** The SPR-positive reactivity of parakeratinized layer could be a characteristic feature of KCOT in comparison with that of the control. This might be based on the difference between the component of KCOT and control in parakeratinization. Furthermore, the widespread staining pattern of SPR1b in KCOT is similar to that in the control, which seems to be a representative feature that SPR1b relates to parakeratinization of KCOT rather stronger than SPR2 or SPR3.

**Relevance:** Our data showed that the SPR-expression pattern of KCOT is abnormal in contrast to that of the parakeratinized gingival epithelium. SPRs consists the components of final products of keratinization. Therefore, to examine SPRs and SPR-related enzymes could clarify the pathological conditions of keratinization of KCOT.

## B119

**The prevalence and the association xerostomia with serum laboratory markers in Indonesians with Rheumatoid Arthritis**H Susanto<sup>1</sup>, R Broto<sup>2</sup>, J Soerono<sup>3</sup>, F Abbas<sup>4</sup>, A Vissink<sup>5</sup><sup>1</sup>Department of Oral Medicine, Faculty of Dentistry, Universitas Gadjah Mada, Yogyakarta, Indonesia, <sup>2</sup>Department of Internal Medicine, Rheumatology Department, PKU Hospital, Yogyakarta, Indonesia, <sup>3</sup>Department of Internal Medicine, Rheumatology Department, Faculty of Medicine, Dr. Soetomo Hospital, Airlangga University, Surabaya, Indonesia, <sup>4</sup>Center for Dentistry and Oral Hygiene, University of Groningen, University Medical Center Groningen, Groningen, The Netherlands, <sup>5</sup>Department of Oral and Maxillofacial Surgery, University of Groningen, University Medical Center Groningen, Groningen, The Netherlands**Objective:** Xerostomia is one of oral complication for several chronic autoimmune diseases such as Rheumatoid Arthritis. However, there is not a study revealed the prevalence of xerostomia and the association xerostomia severity with serum laboratory markers in Indonesian with Rheumatoid Arthritis (RA) yet. The aim of this study was to assess the prevalence of xerostomia and association between xerostomia severity and serum laboratory markers in Indonesian with RA patients**Methods:** Of a total 75 consecutive Indonesian Rheumatoid Arthritis patients and 73 Healthy controls were examined for xerostomia using validated xerostomia questionnaires. Data concerning participants characteristic such as Age, Gender/sex, Body mass index (BMI), ethnicity, education level, smoking status, RA duration were collected. The serum Anti Cyclic Citrullinated Protein (ACCP), C-Reactive Protein (CRP), Erythrocytes Sedimentation Rate (ESR), Rheumatoid Factor (RF) levels, were also collected. All data analyzed using chi square test, independent t-test, Mann Whitney U test accordingly with 95% confidence interval.**Results:** The prevalence of xerostomia in our Indonesian RA patients was 50%. Serum ACCP, CRP, ESR, RF, BMI were higher significantly in RA patients than healthy controls**Conclusion:** Xerostomia is common in Indonesian RA patients. The serum laboratory markers were not comparable between RA with xerostomia and RA without xerostomia.**Clinical relevance:** Xerostomia may affect oral health of RA patients, which cause several potential oral problems such as discomfort, chewing, swallowing, speaking and the increase risk for dental caries and opportunistic infection.

## B120

**DNA methylation analysis from oral brushing in OSCC patients**L Sozzi<sup>1</sup>, DB Gissi<sup>1</sup>, L Morandi<sup>2</sup>, A Gabusi<sup>1</sup>, A Tarsitano<sup>3</sup>, C Marchetti<sup>3</sup>, MP Foschini<sup>2</sup>, L Montebugnoli<sup>1</sup><sup>1</sup>Department of Biomedical and Neuromotor Sciences, Section of Oral Sciences, University of Bologna, Italy, <sup>2</sup>Department of Biomedical and Neuromotor Sciences, "M. Malpighi" Section of Anatomic Pathology at Bellaria Hospital, University of Bologna, Italy, <sup>3</sup>Department of Biomedical and Neuromotor Sciences, University of Bologna, Section of Maxillo-facial Surgery at Policlinico S. Orsola-Malpighi, Bologna, Italy**Objectives:** Recent data showed that CpG methylation changes may play a role in the early phases of oral cancer (OSCC) progression. Aim of the present study was to analyze the DNA methylation pattern in a set of genes from OSCC samples, regenerative areas after OSCC surgical removal and from healthy donors. A**Methods:** Specimens from 16 OSCC, 11 regenerative areas after OSCC surgical resection and 25 mucosa from healthy donors were collected by means of oral brushing. A set of 4

previously described methylated genes in OSCC (ZAP70, GP1BB, miR137 and KIF1A) were investigated by bisulfite-Target Next Generation Sequencing (NGS) using MiSEQ platform (Illumina, San Diego, CA). For each gene the most informative CpG island was identified, and a linear discriminant analysis (LDA) was utilized in each specimen to combine the promoter methylation values from all 4 genes. Kruskal Wallis test and multiple range test were used to evaluate the presence of any between- group significant difference; ROC curve analysis was performed to obtain an appropriate cut off level.

**Results:** The mean value of data obtained by gene combination in OSCC samples were significantly different from that in normal mucosa. The mean value obtained in the group of regenerative areas after OSCC surgical removal significantly ( $P < 0.01$ ) differed from both OSCCs and normal mucosa. The combination of all four genes resulted highly sensitive and specific (Area Under Curve = 1). 8/11 samples from regenerative areas after OSCC surgical resection showed higher values with respect to the cut off value.**Conclusions:** Preliminary results confirmed the role of epigenetic alterations in OSCC and also revealed the presence of an aberrant methylation pattern in regenerative areas after OSCC surgical resection.**Relevance:** DNA methylation analysis from oral brushing could be included as non invasive, highly sensitive and specific procedure to study CpG methylation changes in OSCC.

## B121

**Parotid salivary biomarkers of Sjögren's Syndrome**A Jazzar<sup>1</sup>, PJ Shirlaw<sup>2</sup>, G Carpenter<sup>1</sup>, G Proctor<sup>1</sup><sup>1</sup>Mucosal and Salivary Biology Division, Dental Institute, Guy's Hospital, King's College London, London, UK, <sup>2</sup>Department of Oral Medicine, Guy's and St. Thomas' National Health Service Foundation Trust, London, UK

Sjögren's syndrome (SS) is an autoimmune inflammatory disease affecting exocrine glands, has an unclear aetiology with no early diagnostic markers. Patients have an increased risk of low grade lymphoma (MALT-L). There is a growing interest in using saliva as a source of biomarkers to improve the diagnosis and monitoring of SS and MALT-L

**Aim:** To identify salivary markers of disease activity and progression in Sjögren's syndrome.**Methods:** Fifty nine parotid saliva samples were collected from Oral Medicine clinics and grouped as follows: SS (n = 49) subdivided into SS (n = 20), SS at risk of developing (MALT-L) (n = 18), SS with confirmed MALT-L (n = 11). Diseased control patients with non-specific sialadenitis, nodular osteoarthritis, xerostomia (SNOX) (n = 10) and negative for SS, Age, sex- matched healthy control samples were also collected (n = 17).Twenty cytokines: IFN- $\gamma$ , TNF- $\alpha$ , (IL)-1 $\alpha$ , -1 $\beta$ , -2, -3, -4, -5, -6, -8, -10, -12, -13, -15, -17, -18, -22, -23, MCP1 and MCP3 were assayed using a multiplex bead assay (Luminex Screening Human Magnetic Assay; R&D Systems; Minneapolis MN).**Results:** Five cytokines (IL-1 $\alpha$ , -4, -6, -8 and MCP1) were significantly elevated in the SS group compared to diseased controls ( $P \leq 0.05$ ) (Kruskal-Wallis test followed by Dunn post hoc). Two cytokines (IL-1 $\alpha$  and MCP1) were significantly decreased in the diseased controls compared to healthy controls. However, only one cytokine IL-6 was significantly increased in the SS group compared to the healthy control group.When comparing subgroups of SS, IL-1 $\alpha$ , MCP1 were significantly increased in the MALT-L group compared to the diseased control while IL-1 $\alpha$  and IL-8 were increased in the MALT-L risk group compared to the diseased control group.**Conclusion:** The preliminary results of parotid salivary analyses indicate a list of candidate markers of SS, SS at risk of MALT-L and those with confirmed MALT-L. These potential biomarkers will be further analysed and validated.