Dental Education & Craniofacial Sciences

No. 1
Perceived sources of stress and psychological well-being of undergraduate dental students in Universiti Sains Malaysia
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The objectives of this cross sectional study were to determine the perceived sources of stress among undergraduate dental students in Universiti Sains Malaysia and the influence of stress on their psychological well-being. The Dental Environment Stress (DES) questionnaire and the General Health Questionnaire (GHQ-28) were used to determine the perceived stress and psychological well-being of the students respectively. A total of 258 students participated in this study with 114 of them in the pre-clinical years (year 1, year 2, year 3) and 87 in the clinical years (year 4 and year 5). The mean DES score among clinical students, 82.3 (SD 15.55), was significantly higher than the pre-clinical students, 68.1 (SD 13.48). The major source of stress for the pre-clinical students was fear of failing course or a year with a mean DES score of 3.5 (SD 0.81), while for the clinical students it was patients being late or not showing for their appointments, 3.7 (SD 0.62). The total mean GHQ score for the students was 34.6 (SD 14.82). No significant difference was observed in the mean GHQ scores between the pre-clinical and clinical students. However, a significant linear correlation between DES score and GHQ score was evident (r=0.472). In conclusion, the level of stress and perceived stressors between pre-clinical and clinical dental students differed significantly, and students with higher stress levels are more likely to experience symptoms of psychological disorders.

No. 2
Marginalisation of dental students at Universiti Sains Malaysia and life stress
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This study aims to explore the experience of marginalisation and its relationship with life stress among dental students in a curriculum where teaching and learning of common elements are shared with the medical students. A cross-sectional study was carried out on dental students at USM using 27 items questionnaire to assess the experience of marginalisation and a modified version of DES questionnaire to assess stress. Result showed that all students had experienced at least one form of marginalisation. Hectic timetable, insufficient time to prepare for classes, less time for self-study compared to medical students and narrow views of medical students about dentistry, looked down by lecturer, remarks by medical colleagues and lecturers over relevance basic clinical sciences in dentistry, feeling like a minority, lack of sense of ownership over the curriculum and lecturer compared to medical students are the most prevalent items of marginalisation experienced by the students. Marginalisation was found to be significant but weakly correlated to stress related to personal issues with Pearson correlation of (0.23) in clinical year’s students and overall stress (0.22), stress related to office administration (0.18) and personal stress (0.16) in non-clinical students. Only preclinical female students showed significant association between marginalisation and all other stress factors. Dental students at USM do experience marginalisation in the current curriculum but it has little effect on their stress level. Most of the marginalisation items are related to discrimination and could be overcome by educating the medical students and lecturers about the importance of dentistry in general health.

No. 3
A survey to evaluate related instructions given by the orthodontist in Malaysia to their orthodontic patients
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Insufficient information is available regarding the presentation of related instructions given by the orthodontists. The purpose of this study was to find out the extensiveness of related instructions given by the orthodontist in Malaysia and to associate the instructions given to the years of service and type of practice. Questionnaire were sent to 120 qualified orthodontist, only 48 responded data were analyzed. Descriptive statistics and ANOVA were used. Our results demonstrated that most orthodontists advised on the use of manual orthodontic toothbrush (95.8%), interdental toothbrush (81.3%) and fluoridated toothpaste (91.7%). Half of the respondent (56.3%) prescribed fluoride mouthwashes. Most favour Oral B and Colgate Phos-fur despite of the neutral pH level preference (72.9%). Minority recommend on electric toothbrush (2.1%), disclosing tablet (2.1%), oral irrigator (4.2%) and chlorhexidine mouthwashes (2.1%). Most instructed to avoid hard
food (95.8%) and sticky food (85.4%). However, only 70.8% advised to avoid bicarbonate drinks. 66.7% instructed to come immediately when problems arising, 52.1% preferred 24 hours wear of orthopaedic appliances, 66.7% advised on whole day retainer in the first year postdebond and 81.3% on whole day use of elastic. Young orthodontists significantly advised on interdental toothbrush (p=0.029) compare to senior. Orthodontists practice at university, significantly less preferred chlorhexidine mouthwashes compared to those in ministry of health (p=0.045) and private (p=0.031). In conclusion, the findings demonstrated the extensiveness related instructions given during orthodontic treatment is still not in standard level to achieve excellent outcome of the treatment.

No. 4 Perception by public and healthcare professionals towards Oral and Maxillofacial Surgery (OMFS)
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Oral and maxillofacial surgery (OMFS) is a surgical branch of dentistry that deals with the wide spectrum of diseases, injuries and defects in the maxillofacial region. There are plenty of people who have lack of awareness towards the wide surgical scope provided by OMFS as reported by previous study done in Boston in 1996. The purpose of this study was to assess the level of awareness among the general public and healthcare professionals towards Oral and Maxillofacial Surgery specialty in Hospital Universiti Sains Malaysia (HUSM) Kubang Kerian, Kelantan. A total of 186 standardized questionnaires was distributed to 6 groups of respondents which include general public attending HUSM, 4th year dental and medical students, dental officers, medical officers and paramedical workers from various departments such as Emergency department, Ear, Nose and Throat (ENT) department, medical family clinic and dental clinic of HUSM. The data showed that 100% of students and practitioners had heard of OMFS, whereas only 68.9% of the general public have heard of the specialty. Furthermore, only 11.6% of the lay responders had been treated by an OMFS. The full results also suggested that about 50% of general public, 35% of medical professionals and 30% of dental professionals had lack of understanding about the range of care provided by OMFS specialty. A thorough education need to be implemented among dental and medical undergraduate students as well as professionals so that they can make a proper referral later on and automatically provide correct information to the general public.

No. 5 Phase III Elective Programme satisfaction from students' perspective
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The School of Dental Sciences, Universiti Sains Malaysia has organised the Phase III Elective Programme, which is research based in nature, as part of the Doctor of Dental Sciences degree requirement for nine consecutive years but its benefits to the students has never been evaluated. This study aimed to assess satisfactions towards this programme from the students' perspective in the aspects of supervision, infrastructure, research environment, implementation, skills development as well as goals and standards. A total of 40 undergraduate students (males 17.5%, females 82.5%), who have completed the programme participated in this study with a response rate of 100%. A set of self-administered anonymous questionnaires was used. A total of 77.5% agreed that supervisory support was important but only 55% were satisfied with it. About 75% thought that the opportunities to develop research skills were important but only 50% were satisfied. Furthermore, 72.5% agreed that access to appropriate facilities was important but only 55% were satisfied. The research environment was important for 72.5% of students however only 55% were satisfied. Only 55% of students understood the required standard for this programme and 52.5% comprehended its requirements. For the overall experience, 72.5% agreed that this programme was important however only 57.5% were satisfied. In conclusion, this programme appeared to instill positive influence to the students but nearly half of them were not satisfied with the implementation. The dissatisfaction aspects need to be dealt with to improve the programme so that its full benefit can be conveyed to the students.

No. 6 The closure of cranial fontanelles in Malay infants estimated with three dimensional computed tomography: a preliminary study
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A preliminary study aimed to determine the closure time of cranial fontanelles was conducted in 34 (18 males and 16 females) term Malay infants with no clinical evidence of gross congenital disorders using three dimensional computed tomography (3D CT) images. The subjects, with their age ranging from 0.4 to 36.0 months old (mean = 13.0; SD = 10.9), underwent the CT scanning using General Electric (GE) Light Speed Plus CT Scanner System (Wisconsin, USA) housed in Radiology Department, Hospital Universiti Sains Malaysia for reasons other
than research purposes. The initial two dimensional
formats were then reconstructed into three
dimensional images by OsiriX V3.7 (Geneva,
Switzerland) for closure assessment. Closure
pattern of cranial fontanelles was observed with
their respective closure time estimated and
analysed. The size of anterior fontanelles was
further measured in 16 of the subjects, of whom
the anterior fontanelles were open and the
captured images were of good quality (slice
thickness: 1.25mm; slice intervals: 1.25mm) by
using oblique dimension measurement technique.
Data analysis was done using SPSS V18.0 (Chicago,
IL, USA). Cranial fontanelles were found closed in
the following sequence: posterior, sphenoid,
mastoid and anterior, and significant moderate
negative correlation was demonstrated between the
infants’ age and the size of anterior fontanelles
(Spearman’s rho = -0.55). The estimated normal
closure time of each cranial fontanelle in Malay
populations serves as a reference for early
diagnosis and early intervention of underlying
diseases associated with premature or delayed
closures of the fontanelles.

No. 7
The prevalence of the likelihood of obstructive sleep apnoea among dental staffs in Universiti Sains Malaysia (USM) Kubang Kerian: a cross sectional survey

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Obstructive sleep apnoea (OSA) is a common
condition characterized by repetitive episodes of
partial or complete upper airway obstruction during
sleep. This study aimed to determine the
prevalence of the likelihood of OSA among the
school dental sciences staffs in USM and to study the
relationship between different categories of BMI
and the prevalence of OSA as well as to assess the
outcome of the two different sets of questionnaires
(Epworth Sleepiness Scale and Berlin Questionnaire) in determining OSA. This is a cross
sectional study whereby one hundred subjects
(n=100) aged 25 years and above were selected
randomly. Selected subjects were asked to complete two guided questionnaires; Epworth Sleepiness Scale (ESS) and Berlin Questionnaires
(BQ). The prevalence of snoring among male staffs
was higher than female staffs, 21% to 9%. Subjects with high body mass index (BMI) (pre-
obeze and obese groups) developed more daytime
sleepiness and at high risk in developing OSA compared to underweight and normal BMI subjects.
The ESS was more accurate in assessing the
likelihood of OSA compared to BQ as 84% of the
subjects found to have mild to moderate score in
ESS while only 4% of the subjects scored high risk of
OSA according to Berlin Questionnaire. In
conclusion, there is a high prevalence of OSA
during sleeping as well as develops excessive
daytime sleepiness are the contributor factors to
the increase prevalence of OSA among the USM
dental sciences staffs, Kubang Kerian, Kelantan.

No. 8
Tooth brushing habits in low and high risk
caries in children

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This study compared tooth brushing habits of
children with high caries risk (HCR) and low caries risk (LCR). Healthy co-operative children aged
between 6 and 12 years participated in this study.
Tooth-brushing habits were documented using
questionnaire and a video recording of the child
brushing his/her teeth. Seventy two subjects (26
LCR and 46 HCR) were randomly selected out of
108 children. Statistical significance between groups
was done using chi-square test. Most of them
(57.7% in LCR group and 54.3% in HCR group)
brushed their teeth twice daily. More than half of the
children (57.7% from LCR group and 52.25%
from HCR group) were supervised by the parents (P
value=0.04). Fluoridated toothpaste was used by
88.5% and 78.3% of LCR and HCR children
respectively. Children who applied toothpaste
themselves were 92.3% and 71.2% in LCR and
HCR group respectively, which was significantly
different (P value=0.04). From the study, more
than half of the children used pea-sized toothpaste
during tooth brushing regardless of the caries risk
group. Most of the children used the scrub
technique (65.3%). Most of the LCR children
brushed their teeth between 30 and 60 seconds
(42.3%), while most of the HCR children brushed
their teeth between 60 and 90 seconds (41.3%).
Most children used cup for rinsing after tooth
brushing (80.8% and 69.6% from LCR and HCR
group respectively). Most of the variables showed
no statistically significant differences between the
groups. Tooth-brushing habits did not vary between
children with HCR and LCR.

No. 9
Mandibular condylar fractures in HUSM: a
retrospective study from 2006 - 2010

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Condylar fractures are common in mandibular
fractures. In developed countries, the main
aetiology of mandibular condylar fracture are fights
and assaults, followed by motor vehicle accident
(MVA). Whilst in most developing countries, MVA is
the main cause of mandibular condylar fracture. A
retrospective study was done from 2006- 2010, to
determine the aetiology, the level of condylar
fracture of mandible and post-operation complication. Data were collected from patients’ clinical folders. 28 patients with mandibular condylar fractures were seen at the Accident and Emergency Theatre, Oral Maxillofacial Clinic, Operation Theatre (General and Oral Maxillofacial) and Oral Maxillofacial ward of the Hospital Universiti Sains Malaysia (HUSM). A high proportion of mandibular condylar fractures (75%) were caused by motor vehicle accident (MVA), followed by falls (17.8%), industrial accidents (3.6%) and fights and assaults (1 patient, 3.6%). The most common site of condylar fracture was condylar neck fractures (53.57%), followed by sub-condylar fractures (39.29%) and condylar head fractures (7.14%). The most common post-operative complications were limitation in mouth opening (37%), deviation of mandible during mouth opening (15%) and malocclusion (11%). In conclusion, this study indicated that the main cause of condylar fracture was MVA followed by industrial accident. The condylar neck of the mandible was the most common fracture site followed by sub-condylar fracture. Limitation mouth opening and deviation of mandible during mouth opening were the post-operation complications.

No. 11
Validity of cone beam dental image on estimation of implant fixtures length
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Cone beam computed tomography (CBCT) enables acquisition of three dimensional images with several advantages which overcome the limitations of traditional two dimensional imaging modalities. This study aimed to determine the validity of cone beam dental image by determining distortion of clinically placed implant on patient. A total of 47 cone beam dental images of implants taken between the year 2010 to 2011, were examined. The implant fixtures lengths were measured using Planmeca Romexis™ Software 2.3.1.1, which is a product of Planmeca Oy, Finland. Every measurement was then repeated three times and the mean was obtained. The discrepancies between the radiographic estimated length and actual length of implant fixture were calculated. Differences in measurements were analysed using paired t-test. The intraclass correlation was used to determine the correlation. The measurement error was found to range from -1.64mm to 0.64mm (4.61% to 1.86%). The errors were not large and only one value exceeded 1mm. The average measurement error was 0.35mm. Paired t-test showed no significant difference (p>0.05) between implant fixtures length measured in CBCT and the actual size of implant fixtures length. In conclusion, there is no significant difference between implant fixtures length seen in CBCT and the actual implant fixtures length. Therefore, cone beam dental image has proven to be a reliable diagnostic tool in assessment and estimation of implant fixture length.
soft tissue morphology and dental condition in normal and surgically created defect Macaca fascicularis model. Measurement of the soft tissue landmarks of the face and examination of oral cavity were conducted systematically. The dental impressions of the monkey were also taken using the constructed special tray. For the result, the measurement of the landmarks shows positive deviation of the jaw towards the affected side while jaw excursion showed restriction of movement to the unaffected side. Based on Pruzansky classification of HFM, this model showed retardation of growth mainly on the mandible of the affected side but there is also suggestion of maxillary retardation as the arches were shallow. Furthermore, results obtained also showed that dental caries present in both the normal female and abnormal male. The periodontal problems are present in all the monkeys while the tooth wear index varies accordingly and being the most severe is the normal female. The current investigation suggested that the unilateral hemifacial microsomia like defect showed some degree of manifestation based on Pruzansky classification of HFM.

**Clinical**

**No. 1**

*A study on dental caries experience of oncology children and KAP of their mothers on dental care (comparative cross sectional study)*

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Children with cancer represent a cross-section of child population in Malaysia. Thus, it is not an unreasonable expectation that their dental caries experience would be high. This study aimed to compare dental caries experience of children with cancer attending the Hospital Universiti Sains Malaysia (HUSM) and the knowledge, attitude and practices of their mothers on oral health care with that of healthy children. A comparative cross-sectional study was conducted on 45 randomly selected mothers of oncology children attending the Paediatric Oncology Clinic, HUSM. Guided questionnaire regarding oral health care was distributed to the mothers followed by dental examination of their children aged 16 years and below to assess caries experience. The same methodology was repeated on 45 subjects of healthy control group who attended the Outpatient Clinic, HUSM. Data were analysed using independent t-test with p<0.05 indicates statistical significance. Result showed no significant difference in knowledge, attitude and practices score of mothers whose children suffered from cancer towards dental care compared to the healthy group. The mean (SD) of DMFT of healthy children and oncology children were 0.18(0.54) and 0.91(1.49) respectively. The oncology children exhibited significantly higher DMFT score than the healthy group (P=0.003). In conclusion, the oncology children have higher caries experience compared to healthy children. However, there was no significant difference in knowledge, attitude and practices score of their mothers towards oral health care.

**No. 2**

*Self reported halitosis among undergraduate student of Universiti Sains Malaysia Health Campus*

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Self-reported halitosis and the factors associated with it might help in planning effective strategies to promote oral health and general health. This study was aimed to determine the prevalence of self-reported halitosis and its associating factors among undergraduate students from Health Campus, Universiti Sains Malaysia. A cross-sectional study was carried out among medical, dental and health science undergraduates. A pre-tested self-administered questionnaire was used to assess the self-reported halitosis, timing of halitosis, oral hygiene practices, bleeding gums, dryness of the mouth and tongue coating. The respondents consisted of 300 students 98 (32.7%) male and 202 (67.3%) female of mean age 21.7 (SD: 1.75) years. Self-reported halitosis by hand-on-mouth technique was reported by 11.2% of males and 11.4% females. Eight percent of male and 5% of female respondents experienced bad breath interference during work in the last month. No significant association was found between gender and self-reported halitosis. Majority (79.7%) of students experienced their worst breath after waking up. Significant association was found between self-reported halitosis and mouthwash usage (p<0.05), tongue brushing (p<0.05), gum bleeding (p<0.05) and dry mouth (p<0.05). Significantly more non-dental students able to smell their own breath (p<0.05), reported halitosis using hand-over-mouth technique (p<0.05), had bad breath interfere at their work during the last month (p<0.05), denied daily interdental flossing (p<0.001) and suffered dry mouth (p<0.001) compared to dental students. Halitosis is more common among non-dental students. Professional care and motivation on the use of oral hygiene aids are required for them.

**No. 3**

*10 year prevalence of oral cancer in Hospital Universiti Sains Malaysia (HUSM)*

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This study aimed to review 10 years prevalence of oral cancer cases treated in Hospital Universiti Sains
Malaysia (HUSM), Kelantan, Malaysia from 2001 until 2010. This was an epidemiological-based retrospective study in which the data were reviewed from the patient's medical record at Record Unit of HUSM. Only patients who were diagnosed having oral cancer in specific site such as tongue, buccal mucosa, palate, gingival and floor of the mouth were included in this study. Data on socio-demographic background, clinical and histological characteristics and treatment profile of the patients were obtained. Of 77 patients, majority of the patients were males (68.8%) and (46.8%) were from elderly aged group, 60 years and above with a mean age of 55.9. Malays made up most patients diagnosed with oral cancer, followed by Chinese and Indians. Tongue (67.5%) was the most common site involved and squamous cell carcinoma (SCC) was the most common histological type seen (88.3%) with majority of them were well-differentiated SCC (53.7%). Most of the patients (62.3%) were diagnosed with stage IV disease with tumour size were more than two to four cm in diameter (40%). 80.5% patients underwent treatment consisting of surgery or radiotherapy or chemotherapy or in combination. In conclusion, majority of the patients diagnosed in HUSM were elderly patient and presented in advanced stage (Stage IV). Therefore, more aggressive planning should be done to detect the disease in early stage and thus prevent the disease from increasing in numbers.

No. 4

The measurement of effective dose absorbed by thyroid tissue during Cone Beam Computed Tomography (CBCT) procedures

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During X-ray exposure different organ has different radiation absorption dose. Thyroid is one of the vital organs exposed to scatter radiation during CBCT scanning procedure. The effective dose absorbed by thyroid tissue during CBCT scanning procedure was determined. Thermoluminescent dosimeters (TLD-100H) were placed on 31 subjects above the thyroid gland on the neck before the commencement of CBCT procedures. Exposure was done with normal parameter under small field of view (FOV). Reading of TLD was done with Harshaw 3500 Automatic Reader and control was done by means of measuring background radiation using dedicated TLD. The TLD readings were used to calculate absorbed dose, equivalent dose and effective dose. The thyroid weighting factor used is 0.04 as prescribed by the International Commission on Radiological Protection (ICRP) Publication 103 (2007). Patients' effective dose ranges from 0.1914 μSv to 4.47 μSv with mean 1.645 μSv. Background radiation effective dose ranges from 0.0098 μSv to 0.3473 μSv with mean 0.2274 μSv. The effective dose absorbed by thyroid tissue is lower compared to MSCT and older panoramic radiography device.

No. 5

Image quality of intra oral radiograph

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The aims of this study were to determine the processing protocols of developing intra oral x-rays as compared with the recommended guidelines and to evaluate the image quality of intra oral x-rays. In the first part of this study, the procedures of developing intra oral x-rays of 50 dental staffs and students were observed and compared against the recommended guidelines. In the second part, 558 randomly selected patient records were reviewed and intra oral x-rays including periapicals, bitewings and occlusals were examined for mounting, storage and image quality. All the subjects followed the procedures regarding patient wearing a lead gown, using sterile x-ray holder and disinfecting the x-ray holder. However, many subjects did not follow certain guidelines such as wearing mask (30%), wearing goggle (52%) and wearing glove (8%). 18% of the subjects also did not ask their patients to wait outside the x-ray room while others were taking x-ray. In term of processing, 46%, 82% and 60% of the subjects respectively did not follow the recommended time for developing, washing and fixing. More than half (52%) of the subjects used air spray to dry the films. For mounting, 31.7%, 53.1% and 27.8% of the films respectively were not labeled with patients’ reference number, patients’ full name and date of the x-ray taken. 7.9%, 44.3% and 47.8% of the image respectively were of good, adequate and poor qualities. High number of students and staffs were not practicing the recommended guidelines when processing intra oral x-rays that may lead to poor image quality.

No. 6

Temporary and coronal restorations of endodontically treated teeth

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Temporary and coronal restorations may influence the outcome of endodontic treatment. The objective of this study was to determine the temporary and coronal restorations used in endodontic treatment as compared to the established guidelines. Fifty folders with endodontically treated teeth were reviewed. A total of 58 treated teeth were reviewed and majority of the teeth examined were from female. Most of the patients were of the age range from 20 to 29
Evaluation of serum anti-cardiolipin antibodies in patients with chronic periodontitis: a pilot study

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Chronic periodontitis is one of the most prevalent chronic diseases affecting people worldwide. It is multifactorial including bacterial plaque associated with genetic as well as environmental factors. The association between periodontitis and serum anti-cardiolipin antibodies levels has recently been taken into account. Anti-cardiolipin antibodies are antibodies directed against cardiolipin which believed to have periodontal tissues destruction effect. The immunological status of patients with chronic periodontitis may help in long term management of the problem. This study aims to evaluate the serum immunoglobulin G (IgG) and immunoglobulin M (IgM) among adults and to determine its association with chronic periodontitis. Fifteen healthy adults and fifteen newly diagnosed chronic periodontitis patients aged 18-60 years old, who majority were Malays (80%) and 20% were Chinese, attending HUSM Dental Clinic were randomly selected. Oral examination was carried out to determine the periodontal status using the plaque score, gingivitis score and periodontal pocket depth. Besides, orthopantomograp radiograph (OPG) has been taken to access the alveolar bone loss of chronic periodontitis patients. Blood samples were taken and serum IgG and IgM levels were analyzed using Enzyme Linked Immunosorbent Assay (ELISA) method. Serum IgG and IgM levels were found to be normal in all patients (less than 10GPL Unit/ml for IgG and less than 7MPL Unit/ml for IgM). There was no significant association between serum immunoglobulin levels and chronic periodontitis. Thus, studies with a bigger sample size need to be carried out to evaluate the immunological status and its association with chronic periodontitis in future.

No. 8

Influence of glycosylated hemoglobin (HbA1c) level on the development of dental caries in type 1 and type 2 diabetic patients

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Diabetes mellitus is the most frequent chronic disease in today society. This study aimed to compare caries experience and oral hygiene between diabetic patients and non-diabetic control group, also between subgroup of diabetic patients with different disease evolution, present of complications and metabolic control (HbA1c). This cross-sectional study was conducted in 32 diabetic patients and 32 non-diabetic subjects. Dental caries experience was measured using the Decayed, Missing and Filled Teeth Index (DMFT) according to the WHO caries diagnostic criteria. Oral examination using a plain mouth mirror and standard probe was performed without radiograph assessment. Oral hygiene status was assessed using simplified oral hygiene index (OHI-S). In diabetic group, data like glycosylated hemoglobin (HbA1c), evolution of the disease in years and the existence of complications such as diabetic neuropathy or retinopathy were collected. Oral hygiene status does not show any significant differences (p>0.05) although diabetic patients are slightly higher (1.42±1.00) compared to control groups (1.16±0.76). For DMFT score, there are significant differences between diabetic group (16.34±7.16) and control group (7.72±5.66) with p<0.05. In diabetic group, no significance different was found on the oral hygiene index and DMFT score for any of the parameters analyzed. In conclusion, we have observed a larger number of DMFT in the diabetic population in regards to a healthy population. We have found no differences in the DMFT and oral hygiene status based on metabolic control, evolution time and existence of late complications of diabetes.
No. 9

Comparison of the effectiveness between turmeric and triamcinolone for treatment of minor recurrent aphthous stomatitis in oral cavity

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There are many medications and traditional remedy in treating mouth ulcers. This study aimed to compare the effectiveness between turmeric and triamcinolone in treating minor recurrent aphthous ulcer in oral cavity. The effectiveness of healing ulcer was measured using two parameters which are the ulcer size and pain score. Twenty patients (n=20) with minor recurrent aphthous stomatitis were volunteered to join the study. They are the students of Healthy Campus of Universiti Sains Malaysia, Kelantan with no known medical illness. They were divided into two groups. One group received triamcinolone acetonide (0.1%) and the other group received turmeric powder. The subjects were required to apply the medication twice per day. Ulcer size and pain were measured on treatment days 1 and 5. Data were analyzed using t test for independent sample. P value below 0.05 considered to be significant. No significant differences were found between the two groups studied. In conclusion, the two treatments applied had similar effectiveness as they both relieved pain and reduced the size of recurrent aphthous ulcers. But, as an alternative, the turmeric can be used for treating minor recurrent aphthous ulcer meanwhile the triamcinolone cannot be used in long term management in treating the ulcer.

No. 10

Genetic screening of Exon2 Aquaporin3 gene in chronic periodontitis patients: a preliminary study.

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Aquaporin3 (AQP3) belongs to the water channel protein family located at the cell membranes and may acts as inflammatory mediator in some lesions. It was found to be highly express in the gum tissue of chronic periodontitis patient which led to the speculation that AQP3 may play a role in periodontitis. The aimed of this study was to investigate the presence of DNA sequence variable of exon2 of AQP3 in the chronic periodontitis patient. This study was a preliminary cross sectional comparative study whereby buccal swab was taken from nine patients and nine normal subjects. DNA was then extracted from the buccal cells using DNA extraction kit. The exon2 of AQP3 gene was amplified and optimized by polymerase chain reaction (PCR) reaction technique. The amplified products were sent for sequencing. Finally, the sequencing data were analyzed by comparing the sequences obtained with the sequences from the Genebank as a standard sequence reference using ClustalW alignment application of BioEdit software. There is no sequence alteration in exon2 AQP3 of all samples. The present data suggest that exon2 AQP3 gene is not the risk factor for chronic periodontitis occurrence. However, increased of sample size and polymorphism in other part of AQP3 gene including promoter, exon1, exon3-4 and exon5-6 cannot be dismissed and remain to be elucidated.

No. 11

A study of new mouth rinse on staining ability: an in-vitro study

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A new mouth rinse made in Malaysia is ready on the market now. It is not yet known for its staining ability, thus may compromise dental aesthetics. This study aimed to study in vitro whether the new mouth rinses have the same or less staining ability compared to chlorhexidine. This is a randomized controlled in-vitro study whereby a total of 36 clear acrylic blocks were randomly divided into 4 groups, each group consists of 9 samples and the products to be tested are the colouring and non-colouring new mouth rinse, 0.2% chlorhexidine gluconate and distilled water. All acrylic blocks were cycled through human saliva for 2 minutes followed by one of the tested products for 2 minutes and tea solution for 60 minutes. Optical densities of acrylic blocks were recorded using spectrophotometer at 295nm. Cycle was repeated until 5 days. Data were analyzed statistically using one way analysis of variance with p<0.05 indicating statistical significance. The study showed significant less staining possessed by the non-colouring new mouth rinse (P<0.001) and colouring new mouth rinse (P<0.001) compared to chlorhexidine. However, there was no significant difference between non-colouring and colouring new mouth rinse (P>0.05). There were also no significant differences between non-colouring mouth rinse (P>0.05) and colouring mouth rinse (P>0.05) compared to distilled water. In conclusion, both non-colouring and colouring new mouth rinses have less staining ability compared to chlorhexidine.
No. 12
Attachment of human periodontal ligament fibroblast to in-house pericardium membrane: a scanning electron microscope study
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Bovine pericardium membrane recently has been gaining attention as a reliable bioresorbable barrier membrane that can be used in guided tissue regeneration (GTR) in treating periodontal diseases. However the biocompatibility and nature of the attachment of periodontal cells towards the membrane are still questionable as this has never been studied before. The purpose of this investigation was to study the attachment behavior of human periodontal ligament fibroblasts (HPDLFs) to bovine pericardium membrane using scanning electron microscope (SEM). A sterile in-house bovine pericardium membrane was trimmed to obtain 4 squares of 1.5cm×1.5cm each. The membranes were placed in a tissue culture well plate and 1 ml of cell suspension containing an estimated of 20,000 cells was placed over the membranes carefully. The specimens then placed into an incubator at 37ºC and 95% humidity for 6, 12, 24 and 48 hours. After the incubation period, the specimens had undergone drying process prior to SEM examination. Results showed there were differences in cell morphology of HPDLFs on each membrane that was incubated at different duration. The HPDLFs that were attached to the membranes demonstrated variable cell shapes from round to the elongation of cytoplasmic process depending on the culture intervals. Based on these limited in vitro results, it can be concluded that the HPDLFs have the ability to attach and migrate onto in-house bovine pericardium membrane.

Biomaterial & Basic Sciences

No. 1
Effect of royal jelly on proliferation of fibroblast cell line using MTT assay, Alamar Blue assay and live cell imaging
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The aim of this study was to determine the proliferation effect of royal jelly on human lung fibroblast cell line using MTT assay, Alamar Blue assay and live cell imaging. For cytotoxicity test using MTT assay, MRC-5 cells were seeded and incubated with various concentrations of royal jelly extract (2.5, 1.25, 0.625, 0.3125, 0.1563 and 0.078 mg/ml). The control groups comprised of EMEM alone and EMEM with 10% fetal bovine serum. Subsequently, the cell proliferation was studied for 10 days using Alamar Blue assay. The results were analyzed by plotting fluorescence intensity (or absorbance) versus royal jelly concentration. The population doubling time was determined using live cell imaging by incubating the cells with extract of royal jelly for 24 hours. Statistical analysis was conducted using independent t-test. In MTT assay, the cell viability in treatment group did not differ significantly with the positive group (EMEM + 10% FBS) (p>0.05). Extract concentrations of 0.156 and 0.078 mg/ml produced higher cell viability compared to positive group and hence selected for Alamar Blue test. In the Alamar Blue (AB) test, 0.156 mg/ml and 0.078 mg/ml of royal jelly produced significant difference in AB percentage of reduction compared to positive control (p<0.05) at Day 10. Based on live cell imaging, the population doubling time for positive, negative, 0.156 and 0.078 mg/ml groups were 34.7, 49.8, 49.4 and 49.5 hours respectively. In conclusion, royal jelly does not exhibit similar ability like FBS to facilitate cell growth under the present test conditions.
showed that there was no statistically significance difference between the groups for cervical margin and also between cervical and coronal margins for GA. It is concluded that direct CR restoration results in significant reduction in microleakage in coronal margin while the indirect CR restoration gave the better result in cervical margin.

No. 3

Cytotoxic effects of accelerated white MTA and Malaysian white Portland cement on SHED: an in vitro study

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Despite the favorable biological responses of mineral trioxide aggregate (MTA), it exhibits some drawbacks such as prolonged setting time and high cost. Recently, several studies reported that Portland cement (PC) and MTA have many similar chemical and physical properties, but with PC being less expensive. This study aimed to compare the cytotoxicity of accelerated white MTA (AWMTA) (Dentsply Tulsa Dental, USA) and accelerated Malaysian white PC (AWPC) (Aalborg, Malaysia) on stem cells from human exfoliated deciduous teeth (SHED). The tested materials were introduced into paraffin wax molds after mixing with calcium chloride dihydrate and sterile distilled water. Subsequently, the set cement capsules were sterilized, incubated in a prepared Dulbecco’s modified eagle medium (DMEM) for seven days. CD166 was used for characterization of SHED using flow cytometry. After SHED seeding, the material extracts were added at five concentrations and incubated for 72 hours. The cell viability was evaluated using MTT assay, and the data was analyzed using Mann Whitney test (p<0.05). Results showed that AWMTA revealed significantly greater cell viability at 25 and 12.5 mg/ml concentrations (p<0.05). Concomitantly, AWPC exhibited greater cell viability at concentrations <12.5 mg/ml and the results were significant at 1.563 mg/ml (p<0.05). Both materials demonstrated moderate cytotoxicity at 25 mg/ml and slight cytotoxicity at 6.25 and 3.125 mg/ml. At 1.563 mg/ml, no cytotoxic activity was merely observed with AWPC. In conclusion, AMWPC exhibited favorable and comparable cell viability to that of AWMTA, and has the potential to be used as an economically viable material for dental application.

No. 4

Antimicrobial effects of Kaempferia galanga (cekur) against oral bacteria: an in vitro study

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Traditional herbs are being used widely in various parts of the world, to treat several types of ailments as an alternative in modern medicine. The objective of this study is to assess the antibacterial effects of Kaempferia galanga (cekur) against oral bacteria. This is an in vitro experimental study involving 9 species of oral bacteria namely Streptococcus mutans, Streptococcus sanguis, Streptococcus oralis, Streptococcus sobrinus, Staphylococcus aureus, Lactobacillus salivarius, Enterococcus faecalis, Pseudomonas aeruginosa and Eschericia coli. Agar well diffusion method was employed in this study. 1g/ml of Kaempferia galanga extract was used as stock solution to assess for zone of inhibition in the agar wells. Results showed that Kaempferia galanga water extract and ethanol extract did not exhibit any antibacterial activity towards oral bacteria.

No. 5

Tualang honey enhances osteoblast cell line proliferation and its alkaline phosphatase activity

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Malaysian local honeys have been reported to have various properties such as antioxidant, antimicrobial, anti-inflammatory and anti-apoptotic. The present study investigated the effects of Tualang honey on the proliferation and alkaline phosphatase (ALP) activity in human fetal osteoblast cell line (hFOB 1.19). The cells were cultured in Dulbecco’s modified eagle medium F12 supplemented with 5% fetal bovine serum and 1% penicillin/streptomycin and were treated with Tualang honey at various concentrations (0.01%-5%) for 72 hours. Proliferation analysis by MTT assay showed the highest percentage of cell proliferation (119.03%) when the cells were treated with 0.16% honey. In addition, the level of ALP activity was also assessed from the osteoblast cell line treated with Tualang honey at various concentrations (0.01%-5%) at day 3, 7, 10 and 14. The ALP assay showed that several concentrations of Tualang honey enhanced the level of ALP activity compared to untreated sample. Interestingly, the osteoblast cell line treated with 0.02% honey showed higher ALP activity when measured on day 7, 10 and 14. In conclusion, there were enhanced cell proliferative and ALP activities with the decrease in honey concentration. Therefore, Tualang honey has a great potential as a supplement in culture system to enhance osteoblast growth.
No. 6

Tualang honey may enhance osteoblastic activity by altering OPG/RANKL ratio in human osteoblast cell line

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Bone metabolism involves a complex interaction between bone cells, hormones, cytokines and growth factors. Osteoprotegerin (OPG) and receptor activator of nuclear factor-B ligand (RANKL) are mediators of bone metabolism. RANKL is essential for osteoclast differentiation; while OPG inhibits the differentiation through its binding to RANKL. There is now good evidence that dietary components and natural products can influence bone metabolism, particularly by inhibiting bone resorption. Honey is one of the oldest medicines known with various advantages. The present study was carried out to evaluate the effect of Tualang honey on the expression of OPG and RANKL by human fetal osteoblast cell line (hFOB). The hFOB were cultured and treated with different concentrations of Tualang honey for 3 days and the total RNA was extracted, followed by reverse transcription cDNA synthesis. Semi quantitative reverse transcriptase PCR was performed to detect the expression levels of OPG and RANKL. Results showed that hFOB treated with Tualang honey expressed similar levels of OPG/RANKL ratio as the untreated sample. Interestingly, the level of RANKL expression was lower in the Tualang honey treated group when compared with the untreated group. This finding suggests that Tualang honey may promote osteoblastic activity in hFOB by downregulating the RANKL expression, thus inhibiting osteoclastogenesis and enhancing osteogenesis through the OPG activity.

No. 7

Expression of epithelial gene markers in human dental pulp stem cells

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Human dental pulp stem cells are mesenchymal stem cells which can be derived from the pulp tissue of extracted deciduous (SHED) and permanent teeth (DPSC). Both populations are multipotent stem cells indicating their ability to be differentiated to specific cell lineages. The aim of this study was to detect the expression of epithelial cell gene markers in SHED and DPSC previously cultured in a standard culture medium. Reverse Transcriptase Polymerase Chain Reaction (RT-PCR) was performed on total RNA extracted from SHED and DPSC using specific primers for epithelial cell gene markers; p63 and E-cadherin, under specific PCR condition. Total RNA extracted from cultured keratinocyte cells was used as positive control. PCR products were observed on 2% agarose gel stained with SYBR Green. While p63 and E-cadherin were strongly expressed in keratinocyte, these epithelial cell gene markers were not expressed in both stem cells (SHED and DPSC) analyzed, which suggested that these undifferentiated stem cells did not express specific gene marker for epithelial cells. Thus, it is proposed that induction by specific growth factors is required to differentiate these cells to specific cell lineages.

No. 8

The effect of honey on human periodontal ligament fibroblast proliferation and alkaline phosphatase activity

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Previous studies on honey have shown its potential as an alternative approach in optimizing medical resources for periodontal treatment. However, to date, there has been no study published on the effects of honey on human periodontal ligament fibroblasts (HPDLFs). The aim of this study was to investigate the effect of Tualang honey on HPDLF proliferation and alkaline phosphatase (ALP) activity with an intention to establish honey as one of the natural products which may promote healing and regeneration of periodontium. The HPDLFs were cultured and treated with honey at four different concentrations (0.02%, 0.3%, 1% and 5%) in a 96-well plate and incubated at 37°C with 5% CO2. Proliferation test (MTT test) was assessed up to day 3 whereas ALP activity (ALP assay) was assessed up to day 7. The αMEM supplemented with 10% FBS and 1% penicillin streptomycin was used as control. Results for MTT showed that the absorbance for 0.02% honey concentration was significantly higher (p<0.05) on day 2 and day 3 whereas absorbance for 1% honey and 5% honey were significantly lower (p<0.05) than control on all the 3 days. There was increase in ALP activity in a similar pattern for all concentration groups from day 0 to day 7 without any significant difference compared with control. Therefore, within limitation of this study, it can be concluded from the present data that Tualang honey stimulated HPDLF proliferation at low concentrations but has an inhibitory effect at high concentrations, and may not have any role in osteoblastic differentiation.
No. 9

Comparison between microleakage of composite and porcelain in class V restoration: an in vitro study

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Composite resin (CR) undergoes polymerisation shrinkage which caused microleakage leading to marginal staining and secondary caries. Porcelain is strong and esthetically-favourable but is rarely used in class V restorations. This in vitro study aims to assess the presence and compare the percentage of microleakage between direct, indirect CR and porcelain in restoring class V cavity. Class V cavities measuring 4mm x 3mm x 2.5mm depth were prepared on the buccal surfaces of 96 extracted premolar teeth. The teeth were randomly assigned into 3 groups (n=32) where Group 1 was restored with Filtek Z350 nanocomposite (3M ESPE, USA), Group 2 were restored with ceramage A3B (SHOFU, Japan) and Group 3 was cemented with IPS e.max Press all ceramic cervical inlay (Ivoclar-Vivadent, Zurich). All teeth were then subjected to 600 thermocycles between 5°C and 55°C before immersion in 2% methylene blue dye for 24 hours. The teeth were sectioned vertically into half by hard tissue cutter (EXAKT, Germany). Dye penetration depths were measured using Leica imaging system (UK) at 30x magnification. All the data was analyzed with One Way Anova at p=0.05 followed by Post-hoc (Tukeys) using SPSS 18.0. The result shows porcelain cervical inlay group has significantly less microleakage than direct CR group (p=0.045) but there is no significant difference compared to indirect CR (p=0.973). No significant difference was discovered in microleakage depth between direct and indirect CR (p=0.077). In conclusion, porcelain cervical inlay could be an alternative in restoring class V cavity for clinicians due to better marginal seal and aesthetic.

No. 10

Evaluation of bond strength and surface characteristics of fiber post after UV irradiation

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The study was aimed to evaluate the effectiveness of ultraviolet (UV) irradiation in improving bond strength of fiber posts and to determine the changes of the surface characteristics. Twenty fiber posts (FRC Prostec Plus) were used for this study which were divided into 4 groups (n=5) and were treated with the following procedures; no UV irradiation (control), UV irradiation for 15 minutes, 20 minutes and 30 minutes. Specimens were immediately bonded with SF CEM clicker (3M ESPE, Germany), the resin luting cement and were stored in wet and dark container for two to three hours Shear bond strength (SBS) in MPa were measured using universal testing machine model 8874 (Instron, USA) and the debonded fiber post surfaces were examined under scanning electron microscope (SEM). Separate post materials were used to measure surface roughness of fiber post using atomic force microscopy (AFM). Data of SBS were analyzed statistically using one way ANOVA followed by Post Hoc multiple comparison (p<0.05). SBS was significantly higher by 20 minutes UV irradiation of fiber post surface (p=0.038). Under SEM, resin cement more evident on the surface of debonded post with 20 minutes UV irradiation group. Surface roughness for the control was Ra=175.1 nm and for the 20 minutes group was Ra= 929.2 nm. Debonded post samples and higher roughness after UV exposure certainly proved the changes of the surface characteristic of fiber post and were responsible for significantly higher bond strength. These results suggested that UV irradiation of 20 minutes would improve the bond strength of fiber post.

No. 11

Push-out bond strength of luting cements to titanium post under different dentin condition: an in vitro study

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Bonding of restorative materials to dentin is more difficult due to high organic composition, continuous moist condition, permeability properties and presence of smear on dentin after preparation. This study aimed to compare push-out bond strength of various luting cements with titanium post under different dentin condition. A total of 30 teeth were root treated by manual protaper, obturated and were divided into 3 subgroups after Gutta-Percha removal. Titanium post were cemented using two types of resin cements, SF CEM Clicker (3M ESPE, Germany), G-CEM (GC Corp., Japan) and Poly-F (Dentsply, Germany) a polycarboxylate cement, under dry (n=5) and moist (n=5) dentin condition. Each tooth was horizontally sectioned into four, 2mm thick serial slices by means of low-speed saw. Push-out bond strength (PBS) of each slice were tested under universal testing machine at a cross head speed of 0.5mm/min. Data were statistically evaluated using Kruskal-Wallis and Mann-Whitney
Poly-F in dry dentin was the highest, 16.69MPa (9.06); while SF CEM Clicker in moist dentin was the lowest, which was 6.95MPa (5.80). The PBS of G-CEM in dry dentin exhibited significantly higher than in moist dentin (p≤0.05). In both dry and moist dentin condition of Poly-F was significantly higher, followed by G-CEM and SF CEM Clicker (p≤0.05). Post-hoc test shown Poly-F has significant higher PBS compared to SF CEM Clicker (p≤0.017) in both dry and moist dentin condition. As a conclusion, G-CEM showed higher PBS in dry dentin. In term of adhesive ability, Poly-F has stronger adhesive ability compared to SF CEM Clicker.

No. 12
Tualang honey enhances bone marker expression by human periodontal ligament fibroblast
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Honey has several therapeutic properties both in medical and dental fields. The periodontal fibroblasts show capability in restoring both soft and mineralized connective tissues when appropriately triggered. The cells were shown to express receptor activator of nuclear factor kappa β ligand (RANKL) and osteoprotegrin (OPG); the former activates osteoclasts differentiation, whereas the latter down regulates the activity. The balance in the ratio of OPG to RANKL is used to determine the net effect on osteogenesis. The aim of the present study was to investigate the effect of honey on the expression of RANKL and its inhibitor, OPG by human periodontal ligament fibroblasts (HPDLFs). The HPDLFs were cultured and treated with different concentrations of Tualang honey for 3 days. The cell pellets were collected followed by total RNA extraction, and reverse transcription cDNA synthesis. Semi-quantitative reverse transcription polymerase chain reaction was performed to detect gene expression of OPG and RANKL. Data analysis showed HPDLFs expressed higher OPG/RANKL ratio after treatment with Tualang honey especially at 0.02% concentration in comparison to the untreated sample. The finding suggested that at lower concentrations, Tualang honey may promote osteoblastic activity in HPDLF, which enhances osteogenesis and down regulates osteoclastogenesis.

Poster Presentations

P1
Undergraduate requirements for restorative dentistry in Malaysia
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The aim of this study was to identify the requirements in restorative dentistry that undergraduate dental students have to fulfill in order to sit for final examinations in dental schools in Malaysia and to compare those requirement with the competencies stipulated by the Malaysian Qualification Agency (MQA). Questionnaire from a study done previously was modified and used in this study. All questionnaires were sent by post with a reply envelope. Eight dental schools had responded (72%) to the survey and the results showed that although dental schools may differ in the number of numerical requirements, their assessments were quite similar. One school does not practice numerical requirements at all. In term of requirement for full crown, majority of the schools (88%) agreed that porcelain bonded to metal crown should be included in the numerical requirement. In contrast, majority of the schools (88%) did not include inlay/onlay in their numerical requirements. For plastic restorations like composite resin, amalgam and glass ionomer, majority of the schools (88%) used numerical requirements. Majority of the schools also agreed on numerical requirements for conventional bridge (88%) and incisor to molar endodontics (88%), but not for resin bonded bridge (75%). In conclusion, this study shows that there is a disparity among institutions in Malaysia in terms of finals requirement in restorative dentistry. Ideally, all requirements should be similar among institutions and should closely follow the guidelines provided by the MQA.

P2
Oral care management on head and neck cancer patient at HUSM
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A standard protocol of oral assessment for patients who are to undergo radiotherapy and/or chemotherapy of the head and neck region will help to reduce the risk of oral complications during and after cancer treatment. This study specifically aimed to describe the clinical assessment, the management of oral health performed on head and neck cancer patients at HUSM and also to
determine the association between the referral for oral health assessment and oral complications that arises during head and neck cancer therapy. Dental and medical records of randomly selected patients who had completed cancer treatment since 2005 were traced according to a checklist approved by Oral and Maxillofacial surgeon. A total of 260 records were obtained comprising of 88.8% Malay ethnic group, 10.8% Chinese and 0.4% Indians. Results showed that only 16.9% of patients were referred for oral assessment. A total of 44.2% of patients had one or more oral complications arising from cancer treatment and 59% of them have had oral assessment prior to treatment. Cancer arising from nasopharynx and oral cavity had higher incidence of oral complications; 57.3% and 52.4% respectively. Oral mucositis (29.2%) and xerostomia (26.2%) are the most prevalent oral complications. Patients who did not undergo oral assessment prior to oncology treatment were found to have significantly increased occurrence of oral complications (p=0.032). In conclusion, a standard operating procedure that includes oral assessment and management in the management head and neck cancer may enable preventive measures to be taken and prevent debilitating oral complications.

P3
Retrospective study of ameloblastoma treated in Hospital Universiti Sains Malaysia from 1999-2010
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The aim of this research is to study the prevalence and demographic pattern of ameloblastoma treated in HUSM from 1999 to 2010. 17 cases of ameloblastoma with age ranged from 14 to 57 years old were noted. All patient were Malay and most of them were male (70%). Most of the lesion occurred at the mandible (94%) compared to the maxilla (65%) especially at body of mandible (47%) and the ramus (35.3%). Regarding histolopathological features, mostly were plexiform type (47%) compared to the follicular type(18%) and others (29%). All cases were surgically treated with only 2% recurrence. Infection (29%) and nerve disturbances (52%) are the most common reported complications compared to the other complications.

P4
Impact of helmet usage in oral maxillofacial injuries in Malaysia
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Failure to wear helmet during motorcycle-riding stays as a dilemma among Malaysians. The objective of this study was to evaluate the impact of helmet usage in oral maxillofacial injuries secondary to alleged motor-vehicle accidents among motorcyclists. This is a retrospective analysis done to review oral maxillofacial injury cases secondary to alleged motor-vehicle accident among motorcyclists who were either helmeted or not, attending the Division of Oral and Maxillofacial Surgery at Hospital Universiti Sains Malaysia (HUSM) over a five year period. 164 patients’ medical folders (82 helmeted and 82 non-helmeted patients) were reviewed. The severity of oral maxillofacial injuries was measured using facial 2008 Abbreviated Injury Scale (AIS-08) and analysed using independent t-test. The mean age and frequency for each gender among non-helmeted patients were quantified. Patterns of oral maxillofacial fracture for both groups were cross-tabulated and analysed using Pearson’s chi-square test. From the study, the mean age of affected patients who were non-helmeted was 31.82 years with 68 males and 14 females defaulting helmet usage during motorcycle-riding. Facial AIS-08 was significantly higher among non-helmeted patients (p=0.015). Helmet usage did not influence the pattern of all levels of mandibular and maxillary fractures except zygomatic fracture which was significantly (69.6% zygomatic fracture cases, p=0.043) more frequent among non-helmeted patients. In conclusion, males tend to default helmet usage more than females and the most frequently affected age group was 30-35 years old. Helmet usage is crucial in reducing the severity of oral maxillofacial injuries and the chance of sustaining zygomatic fracture in motor-vehicle accidents among motorcyclists.

P5
The occurrence of C-shaped root canal in Malaysian population
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The recognition of unusual canal’s configurations and variations are essential for successful endodontic diagnosis and treatment. This study aimed to investigate the occurrence of C-shaped root canal in Malaysian population. This is an in vitro study whereby 241 extracted human first and second molars with intact root were collected from several dental clinics in Malaysia. The roots were sectioned at three levels: subpulpal level, 3mm from apical tip and middle level between the first and last level. The appearance of the root canal sections were assessed using stereomicroscope (Leica, Germany) and pictures were taken. Data were analyzed statistically using Fisher’s Exact and Binomial test with p<0.05 indicates statistically significant difference. The occurrence of C-shaped root canals in Malaysian population is 11.2%.
channel among molars collected is 3.73%. Hundred percent of the molars with C-shaped root canal configuration are mandibular molars and 77.8% belonged to Chinese. In conclusion, the findings demonstrated C-shaped root canals present among Malaysians especially the Chinese. Besides, all the teeth that possess C-shaped root canal configuration are lower molars.

P6

In vitro cytotoxicity evaluation of fast set conventional and resin modified glass ionomer cements polymerized at two different times on SHED

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Compared to conventional GICs, resin-modified glass ionomer cements (RMGICs) has gained some clinical popularity due to its better physical and mechanical properties. However, undesirable cytotoxic effects, especially when inadequately polymerized, become their main drawback. Hence, this study aimed to compare the cytotoxicity of conventional GIC (Fuji IX GP Extra, GC Corporation, Japan) and RMGICs (Fuji II GP, GC Corporation, Japan) polymerized at 20 and 40 seconds on Stem Cells from Human Exfoliated Deciduous Teeth (SHED). GICs and RMGICs capsules were manipulated in paraffin wax moulds and incubated in a prepared Dublecco’s modified Eagle medium (DMEM). After seeding the characterized SHED, 6 replicates of seven serially diluted material extract were added and incubated for 72 hours. MTT test was used for cytotoxicity evaluation and the data were analysed using Kruskal-Wallis test. Statistical significance was set at p<0.05. The results showed that both Fuji IX and Fuji II LC (40s) revealed slight cytotoxicity at concentration <25mg/ml while Fuji II LC (20s) was only slightly cytotoxic at <6.25 mg/ml. The half maximal inhibitory concentration (IC50) was found at 45.0 mg/ml, 45.0 mg/ml and 31.25 mg/ml for Fuji IX, Fuji II LC (40s) and Fuji II LC (20s), respectively. Different cytotoxic effects were observed between Fuji II LC polymerized at 20s and 40s and between Fuji IX and Fuji II LC (20s) (p<0.05), and these results were significant in all concentrations except for 50mg/ml. In conclusion, cell viability of RMGICs was comparable to conventional GICs when the polymerization time was doubled.

P7

The antimicrobial effects of Curcuma xanthorrhiza (temulawak) rhizomes against oral bacteria: an in-vitro study

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Curcuma xanthorrhiza Roxb. (Zingiberaceae family, commonly known as ‘temulawak’ plant) rhizomes have been used for medical purpose for hundreds of years. However, little attention has been paid to its effects on oral bacteria. The aims of this study were to determine the antimicrobial effects and the minimal inhibitory concentration (MIC) of Curcuma xanthorrhiza against oral bacteria. The former was determined using agar well diffusion method whereas the latter was determined using broth dilution (Tripticase Soy Broth) method. Nine types of oral bacteria namely Streptococcus mutans, Streptococcus sanguis, Streptococcus oralis, Streptococcus sobrinus, Staphylococcus aureus, Lactobacillus Salivarius, Enterococcus faecalis, Pseudomonas aerugirosa and Eschericca coli were used in this study. Results showed that water extract of Curcuma xanthorrhiza rhizome did not exhibit any antibacterial effects against oral bacteria. ‘Temulawak’ ethanol extract demonstrated antibacterial effects against Streptococcus mutans, Streptococcus sanguis, Streptococcus oralis, Staphylococcus aureus and Enterococcus faecalis. The MIC value was 1g/ml. The MIC value could be utilised as a potential antimicrobial agents for contrivance new dental products such as drugs or mouthwash. Further research should be carried out to deduce the active components of this plant that are responsible for its antibacterial activities.

P8

Effects of acidic health drinks on the surface roughness and hardness of two nano tooth coloured restorative materials.

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The aim of this study was to evaluate and compare the effect of orange juice and isotonic drink on surface roughness and micro-hardness of Nanofilled glass-ionomer (Ketac™ N100 3M ESPE, USA) and Nanohybrid composite (Ceram X, Dentsply, Germany). Test material (n=7) was packed into acrylic mold (5 mm x 2mm), covered with Mylar strip, photo-polymerized, then polished with recommended polishing system. The materials were immersed in distilled water, isotonic drink, and orange juice for 5 minutes per day for 8 days. Baseline and post immersion evaluation for surface roughness was measured using Atomic Force Microscopy, and surface hardness was evaluated with Vickers Hardness Tester FV-7. Data was analyzed with Kruskal Wallis and Mann Whitney Tests at P<0.05. Ceram X showed significant increase in Ra values after immersion in water p=0.021, orange juice p=0.002, and isotonic drink p=0.003. For intergroup comparison, Ra value of
Ceram X in isotonic drink \( p=0.006 \) and orange juice \( p=0.003 \) were significantly higher than in water. Ketac™ N100 showed statistically significant increase in Ra values in orange juice \( p=0.003 \) and isotonic drink \( p=0.010 \). Both Ceram X and Ketac™ N100 did not show any significant difference in Vickers hardness number before and after immersion. Low \( pH \) acidic health drinks caused significant increase in surface roughness in both nanofilled glass-ionomer and nanohybrid composite; however they did not affect their micro-hardness.

P9

Retrospective study of maxillary anterior alveolar bone of Hospital Universiti Sains Malaysia Malay patients using cone-beam computed tomography scan

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Thickness of buccal bone is critical in implantation and orthodontics treatment. This study is aimed to evaluate buccal and palatal alveolar bone thickness and buccal bony curvature below root apex in maxillary anterior teeth of HUSM patients. Twenty-six patients were selected as subjects with criteria of no obvious periodontal diseases, has complete maxillary anterior teeth. The total teeth subjects to be evaluated are 52 teeth. Images which were taken with cone beam CT was traced with Romaxis. Data with respective points were measured and analyzed with one way Anova and post-hoc comparison with Scheffe test with \( p<0.05 \). Results show that buccal and palatal bone plate of maxillary central incisor are relatively thinner \((1.2 \pm 0.32 \) and \(1.9 \pm 0.89\)) than lateral incisor and canine at the level 3mm below the CEJ (A point) with significance of \( p<0.05 \). Measurement of buccal bony curvature below the apex of respective tooth showing central incisor most curved with the mean of \(129.2^\circ \pm 23.39^\circ\) compared with lateral incisor and canines with the means of \(143.4^\circ \pm 11.59^\circ\) and \(144.2^\circ \pm 18.53^\circ\) with significance of \( p<0.05 \). In conclusion, the thickness of maxillary anterior buccal plate was very thin within 2mm and the thickness of palatal plate was thick. The buccal bony curvature below the apex of maxillary central incisor was smaller than that of lateral incisor and canine.

P10

An in vitro genotoxicity study of carboxymethyl cellulose on Ames test

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Palm oil industry is one of the most important sectors in generating economic growth of Malaysia. Its empty fruit branch which is produced from fresh fruit branch can be used to produce carboxymethylcellulose. Carboxymethylcellulose is an acid ether derivative of cellulose which is used as a thickening, emulsifying, and stabilizing agent, as a bulk laxative in medicine and also in toothpaste. Many studies had been done to evaluate the properties of carboxymethylcellulose and there are relatively few studies on its genotoxic properties. The objective of this study was to identify the genotoxic characteristic of carboxymethylcellulose with Ames test with and without metabolite activation system (S9 mix). *Salmonella typhimurium TA1538* was used to test for the genotoxicity of carboxymethylcellulose. The bacteria culture medium was inoculated with the bacteria strain for 48 hours at \(37 \pm 0.5^\circ C\) before the colony growth or revertant colonies were counted. Various concentrations of tested material were used. Non-statistical method was used to analyse the data. The results revealed that the numbers of revertant colonies of *Salmonella typhimurium TA1538* were less than twice number of revertant colonies of negative controls under chosen conditions. Thus, carboxymethylcellulose did not exhibit genotoxic effect.

P11

Comparison of hardness and colour stability between chemical- and light-cured composite resins

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This study aimed to compare the hardness and colour stability between chemical-cured (alpha dent) and light-cured (ivoclar vivadent) composite resins. This *in-vitro* study tested 50 specimens for hardness test; 25 specimens for each chemical-cured and light-cured CR and 40 specimens for colour stability test; 20 for each chemical-cured and light-cured CR. The specimens were prepared according to the manufacturer’s instructions and packed into acrylic mold with internal dimension of 5 mm x 2mm forming disc-shaped materials, which then polished with Sof-lex discs (3M ESPE, USA). Surface hardness was evaluated immediately after polishing with Vickers Hardness Tester PV-7 (Future Tech Corp, Japan). The materials for colour stability test were immersed in coffee drinks for 7 days and evaluated by using spectrophotometer at day 1, 3, 5 and 7. Data was analyzed with paired t-test at \(p<0.05\). Chemical-cured CR showed significant increase in hardness (mean=79.20MPa) compared to light-cured CR (mean=60.06MPa) at \(p=0.001\). For colour stability test, light-cure CR showed better colour stability (mean=-0.06) compared to chemical-cured CR (mean=-0.18) at day 7.
In conclusion, the findings demonstrated that chemical-cured CR has superior hardness properties compared to light-cured CR. However, its colour stability was inferior to light-cured CR, which could be one of the reasons for its reduced popularity among clinicians.

**Evaluation of physical properties and cytotoxicity of gypsum-based biomaterials on L929 fibroblast cells**

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Pure gypsum is a promising biomaterial due to its biodegradable, and biocompatible properties. Polyacrylic acid (PA) exhibits property of adhesion. The aim of this study was to evaluate physical and cytotoxic properties of pure alpha-hemihydrate gypsum (P-Gyp), gypsum-based PA-biomaterials (Gyp-PA), calcium hydroxide (CH) and glass ionomer cement (GIC) for application as liner/ base materials in dentistry; the setting time, solubility (%) in distilled water and cytotoxic effect were evaluated. For cytotoxicity test disc shaped samples were transferred into a culture medium for 24 hours. Eluates of different concentrations were obtained and pipetted onto L-929 mouse fibroblast cultures and incubated for 3 days. Cellular viability was assessed using MTT assay after the incubation period. The degree of cytotoxicity of each sample was determined according to the reference value represented by the cells with a control. Statistical significance was determined by one-way ANOVA followed by post-hoc test (p<0.05) for setting time, solubility (%) and cell viability among the 4 groups of materials. Setting time was significantly higher for P-Gyp and Gyp-PA group of materials; solubility test showed a similar tendency (P-Gyp> Gyp-PA>CH>GIC). P-Gyp was found as the least cytotoxic materials at different concentrations. At 100 mg/ml dilutions of materials in growth medium highest cytotoxicity was observed with CH group. Cytotoxic effect was not observed with P-Gyp and higher solubility of this material might be beneficiary as the material is biodegradable; therefore, application of this novel biomaterial on deeper dentin and possibility of gradual replacement of this biodegradable material by tertiary dentin would be highly promising.

**Push-out bond strength of circular and oval-shaped fiber posts in oval canals: an in-vitro study**

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Oval post space preparation in oval-shaped canals contributes to the preservation of root dentine, reduces the risk of root fracture and increases the retention of the posts in canals. This study aimed to investigate the push-out bond strength of circular and oval fiber posts in oval-shaped canals. This is an in vitro experimental-based study where thirty single-rooted premolars with oval-shaped canals were endodontically instrumented and obturated. The teeth were divided into two groups according to the drill used for post-space preparation and to the post shape (RelyX drill + circular post and Ellipson oval tip + Ellipson post). All the posts were cemented using self-adhesive resin cement. The post-dentine bond strength was evaluated with the thin slices push-out test using universal testing machine at a cross head speed of 0.5mm/min. The bonded surface area was calculated for each post shape with an appropriate geometric formula in order to express the retentive strength in MPa. Data were statistically analyzed with independent t-test. The fractured slices were observed under a scanning electron microscope (SEM) and percentages of slices with respective failure modes were calculated. The results showed that the means (SD) of the push-out bond strength of circular and oval fiber posts were 4.51MPa (3.97) and 6.24MPa (4.01). The oval fiber posts exhibited significantly higher push-out bond strengths (P<0.05). On SEM examination, 75% circular posts and 91.67% oval posts showed adhesive failure between cement and dentine. In conclusion, oval fiber posts achieved higher retentive strengths in oval canals compared to circular ones.