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A Compendium of Abstracts 2009

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FOREWORD
BY THE PRINCIPAL DIRECTOR OF ORAL HEALTH
MINISTRY OF HEALTH MALAYSIA

It gives me great pleasure to write the foreword for this 12th publication of Compendium of Abstracts. As has been the practice of this Division, oral health personnel of the Ministry of Health who conduct research are acknowledged in this annual publication. It is our hope and aspiration to build a strong research-oriented culture among our oral health personnel.

Thus, I would like to urge all top level management in the states to give their fullest support and commitment to realise this aspiration. State and district managers must set the pace by laying the foundation for research to flourish and create suitable environment and opportunities to enable progressive development in research.

This compilation showcases 87 works of research abstracts with 6 being dissertations, 32 presented at scientific conferences and 23 exhibited as posters. This makes a total of 55 presentations at both local and international levels. However only 6 were published in journals and I would like to challenge and exhort all researchers to work towards publication of their articles. It is indeed heartening to note that 13 articles had the involvement of dental auxiliaries as research members. It is my hope that state and district oral health management will continue to give support to such efforts.

I wish to extend my warm and sincere appreciation to all officers whose works are featured in this Compendium and last but not least, to all others who have contributed enormously to put together this Compendium. I congratulate all of you for providing this valuable reference book for both the oral health and research community.

DATO' DR. NORAIN BINTI ABU TALIB
Principal Director
Oral Health Division
Ministry of Health Malaysia

EDITOR'S NOTE

This Compendium of Abstracts 2009 is a compilation of research abstracts that were reported to the Oral Health Division, Ministry of Health in year 2009. These were research outputs gathered from health systems research projects, oral and poster presentations at both local and international scientific meetings, dissertations, submissions to the Director-General of Health, Ministry of Health Malaysia for approval for publication, scientific papers published and other research works of oral health personnel.

The Oral Health Division reserves the right and discretion to edit and modify these abstracts for grammar, length and clarity and to standardise formats in compliance to the requirements of this publication.

In general, the usual convention of abbreviating names of authors shall be used with the surname in full, followed by initials of the first and middle names whereas Muslim names are abbreviated with the first name in full followed by initials of father's name.

Research of public health interest conducted by Specialists is included under the respective clinical specialty research categories.

The Division regrets the exclusion of any research work or presentation that was not reported to this Division in 2009.

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RESEARCH
IN
PROGRAMME EVALUATION

CRITICAL EVALUATION OF THE PRESENT STRATEGY FOR ORAL HEALTH OF PRESCHOOL CHILDREN IN MALAYSIA

Roslinda AS

Introduction: Dental caries remains a significant public health problem amongst preschool children in Malaysia. Although there has been some improvement in oral health status, a significant number of preschool children still suffer from dental caries. This is despite the presence of fluoridated water supply and a well planned dental care system in Malaysia. **Objective:** The aim of this study was to review the current oral health strategies for preschool children in Malaysia and to make recommendations to improve them. **Methodology:** A comprehensive review of the treatment and preventive programmes in Malaysia was undertaken. A critical review of evidence-based treatment and preventive activities revealed limitations of the current preschool programme in Malaysia. Systematic review from Medline & Pubmed was done. **Results:** Even though Malaysia has its own preventive and treatment programmes, dental caries in our preschool children is still a debatable issue. This is most probably because the programme is not adopted fully especially in remote and non-fluoridated areas. **Conclusion:** Future action to promote oral health needs by adopting evidence-based public health approach, for example, the implementation of healthy school programme to the preschool setting, would have a significant impact to achieve sustainable improvement in oral health.

Poster presentation at Quality Initiatives & 1st Johor Oral Health Research Conference, 10-11 June 2009 at Sultan Ismail Hospital, Johor Bahru

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EFFECTIVENESS OF ORGANISED SCHOOL DENTAL SERVICE IN MALAYSIA

Jamaliah AR

Objectives: The aim of this study is to evaluate the effectiveness of organised dental care programme for schoolchildren in the district of Johor Bahru. The objectives are 1. To assess trends in dental caries increments for three consecutive years (2002, 2003, 2004) in the district of Johor Bahru. 2. To suggest ways of improving the implementation of dental care and preventive programmes. **Methodology:** Data collected routinely during the examination of schoolchildren in the school dental service were used to analyse trends in dental caries increments of schoolchildren in 47 selected schools. The schools were ranked according to its level of DMFX at 13 years, with the lowest DMFX score ranked as number 47. Based on the increments, suggestions for improving the implementation of the school dental service were made. **Results:** The levels of mean DMFX and caries increments were low in all 47 schools. More than 50% of schoolchildren in the 47 schools were caries-free. Caries increments follow trend lines. In Johor Bahru, bending of the trend line did not occur which showed lack of preventive and oral health promotion programmes. **Conclusion:** Based on the results and constraints of resources in Johor Bahru, the policy of annual examination of all schoolchildren in Johor Bahru needs to be re-examined. Consideration should be given to fissure sealant programmes in schools with high DMFX. The concept of health-promoting schools should be explored.

Poster presentation at Quality Initiatives & 1st Johor Oral Health Research Conference, 10-11 June 2009 at Sultan Ismail Hospital, Johor Bahru

Dr. Jamaliah Abdul Rahman
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THE EFFECT OF EXTENDING RECALL VISIT IN SECONDARY SCHOOLS WITH HIGH PERCENTAGE OF CARIES-FREE CHILDREN AND LOW CARIES INCREMENT IN JOHOR BAHRU DISTRICT – A PROGRESS REPORT (PHASE 1)

Jamaliah AR, Noridah A

Introduction: With the high percentage of schoolchildren being caries-free in Johor Bahru, much time is actually spent on screening in the School Programme. Due to the high school population, appropriate strategies should be identified so that time and resources could be redirected to those with higher disease level. Longer examination intervals could save resources. **Objectives:** To assess the effect of extending recall interval between dental examinations in selected secondary schools in Johor Bahru district and to recommend an extended recall of 18-24 months based on caries increment and trend. **Methodology:** Data from 2007 were used to select 6 schools with high percentage of caries-free children, low mean DMFX and low caries increment. The schoolchildren in these schools were not examined in 2008. Another 6 schools with almost similar caries status were selected as controls. These children were examined in 2008. In 2009, all schoolchildren will be given annual examination as usual. Data from 2007 and 2009 were analysed and compared. **Results:** The mean DMFX in 2007 in the 6 schools ranged from 0.44 to 0.67, whilst in 2009 the mean DMFX was from 0.34 to 0.86. Caries increment for the 13, 14 and 15-year-olds in 2007 who turned 15, 16 and 17 years respectively in 2009, were low, that is -0.03 to 0.23. The % of children with No Treatment Required (NTR) were also high in 2009 in these schools; from 79.8% to 92.5%. **Conclusion:** With the low caries increment and high % of NTR children, the extended recall dental examination can be considered for implementation in these schools. Further analysis will be done including those of the control group in Phase 2 of the study.

Poster presentation at Quality Initiatives & 1st Johor Oral Health Research Conference, 10-11 June 2009 at Sultan Ismail Hospital, Johor Bahru

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TO INCREASE THE PERCENTAGE OF CARIES-FREE 12-YEAR-OLD SCHOOLCHILDREN IN BANDAR MAHARANI DENTAL CLINIC, MUAR

Wong PY, Saliana AA, Tiu SH

Records of incremental dental care programme show that only 57.1% (2002) and 58.9% (2003) of 12-year-old schoolchildren in Bandar Maharani Dental Clinic were caries-free. The low percentage of caries-free 12-year-old schoolchildren leads to increased work load for dental personnel and reflects inadequate caries prevention provided by our dental service. Dental caries among schoolchildren is preventable by increasing their awareness and knowledge on dental health as well as reinforcement of preventive measures with emphasis on high caries risk individuals and schools. A prospective study was conducted. Information was gathered from Health Management Information System (HMIS) records. The level of knowledge and practice regarding oral healthcare and dietary habits among primary schoolchildren who were of moderate to high caries risk (DMFX=2 and above) were also evaluated using questionnaires. Analysis of the questionnaires concluded that the major contributing factors for high caries levels among the respondents are low socioeconomic background, inadequate knowledge and low awareness on oral healthcare among the respondents and their caregivers. The short-term strategy to change includes improving preventive measures through dental health education to students from schools with high caries prevalence, increasing the number of fissure sealants applied and conducting training on caries calibration for new dental officers and nurses. The long-term strategy focuses on toddlers and preschool children by increasing toddler coverage and the number of visits to kindergartens, as well as increasing the attendance of antenatal mothers to dental clinic. The percentage of caries-free 12-year-old schoolchildren increased from 58.9% in 2003 to 74.8% in 2008. This performance level met the standards of the District Specific Approach for Muar (70%) and Oral Health Goal 2010 (60%). Future action lies in continuing the current preventive programmes to maintain the caries-free status with close monitoring yearly. Toddlers and preschool children will be the next target groups to ensure long-term success.

Keywords: caries-free, schoolchildren, preventive measures, toddler

Poster presentation at Quality Initiatives & 1st Johor Oral Health Research Conference, 10-11 June 2009 at Sultan Ismail Hospital, Johor Bahru and at 6th National Health Conference on 28 – 30 September 2009 at *Universiti Sains Malaysia*, Kubang Kerian, Kelantan

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INCREASING THE COVERAGE OF ANTENATAL MOTHERS SEEN AT DENTAL CLINICS – THE KOTA TINGGI EXPERIENCE

Muz'ini M, Norhamimah A

Introduction: Oral health intervention programme begins with antenatal mothers to ensure that they will impart knowledge and behaviour practices to their children. Reducing the risk of developing tooth decay at an early age will ultimately contribute to healthy caries-free schoolchildren. This programme complements the programme in the maternal and child health clinics. **Objective:** To increase the proportion of antenatal mothers attending dental clinics for oral health education and screening to meet the standard set in the Quality Assurance Programme (Johor State Indicator). **Methodology:** A cross-sectional study was done on attendances of antenatal mothers in ten dental clinics in Kota Tinggi district in the year 2007. Both oral healthcare and maternal healthcare personnel reviewed processes in referral of antenatal mothers to dental clinics. **Results:** After remedial measures, coverage of antenatal mothers seen at dental clinics in Kota Tinggi district increased from 20.8% in year 2005 to 75.4% in year 2007. **Conclusion:** Proper planning of visits to clinics without permanent dental officers and a proper appointment system contribute to the increase in coverage of antenatal mothers seen in all dental clinics in Kota Tinggi district.

Keywords: antenatal mothers, appointment system, proper planning

Project reported to the Oral Health Division, Ministry of Health Malaysia

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EVALUATION OF A TRAINING PROGRAMME FOR HEALTHCARE WORKERS AS ORAL HEALTH EDUCATORS IN THE DISTRICT OF HULU PERAK

Bibi Saerah AK, Noorliza Mastura I

The objectives of this study were to determine and compare the level of oral health knowledge among Healthcare Workers (HCW) in the District of Hulu Perak and Kuala Kangsar and to evaluate the effectiveness of the intervention programmes in terms of increasing oral health knowledge among HCWs in the District of Hulu Perak. This is an intervention study which involved 42 randomly selected participants from Hulu Perak as a study group and 49 participants from Kuala Kangsar as control group. Self-administered questionnaires were given to both groups to capture the general information regarding profile of participants and oral health-related knowledge. A one-day oral heath seminar was conducted for the study group which included lectures and an exhibition. Approximately three weeks later, the same questionnaire was distributed to both study and control groups. Data was analysed using SPSS version 15. Repeated Measure Anova was performed to measure the time*group effect. The mean score (SD) of oral health knowledge was 51.0 (SD=6.56) and 44.3 (SD=5.30) for HCWs in Kuala Kangsar and Hulu Perak respectively and the score was significantly different (independent t-test, $p<0.001$). There was significant improvement in oral health knowledge among HCWs in Hulu Perak after the seminar ($p<0.001$) compared to controls. Therefore it can be concluded that the intervention programme was effective in influencing oral health knowledge among the HCWs.

Keywords: healthcare workers, intervention, oral health knowledge

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THE UTILISATION OF AUXILIARIES IN THE DELIVERY OF ORAL HEALTH SERVICES IN PERAK

Noor Rohana K, Menon RPP, Wardati AM, Palaniasamy M, Syed Nasir SA, Law CH, Bibi Saerah AK

The changing disease patterns in the last few decades have resulted in the need to review dental service delivery, including decisions on the appropriate utilisation of dental personnel in the workforce, and the type of skill mix required in the dental team. The aim of this project is to study the possibility of empowering personnel to assume more responsibilities and ownership of work processes by extending and expanding their roles and responsibilities. This was a cross-sectional qualitative study using the Nominal Group Technique (NGT) conducted in the districts of Larut Matang, Selama and Kuala Kangsar. The categories of dental auxiliaries selected were dental nurses, dental technologists, dental surgery assistants and dental attendants. It was found that the most accepted extended and expanded role of dental nurses was being tutor to other dental personnel. However, an increase in age limits for schoolchildren treatable and providing treatments to adults were poorly accepted. As for the dental technologists, trimming issued dentures as requested by patients and taking primary impressions were being practised by this category of auxiliary. Casting dentures, doing simple denture work and giving dental health education talks to schoolchildren, antenatal mothers and adults were the extended and expanded roles highly accepted by the dental surgery assistants (DSA). Finally, the highest level of acceptance of extended and expanded roles for the dental attendants were conducting toothbrush drills and giving dental health education talks to children. Changes in the global disease pattern which is also observed in Malaysia require a change in strategy in the delivery of dental services. A team approach should be adopted with the dentist taking the role of team leader and maintaining responsibility for overall treatment planning and quality assurance.

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A LONGITUDINAL STUDY OF THE SCHOOL-BASED FISSURE SEALANT PROGRAMME IN THE DISTRICT OF MANJUNG, PERAK

Syed Nasir SA, Hizan MS, Ariahshah D, Wardati AM, Norina B

This is a prospective 5-year longitudinal study using simple random sampling technique. It involved a cohort group of 8-year-old schoolchildren, rendered fissure sealants in the year 2003 by dental nurses. Materials used were Glass Ionomer Cement (GIC) and resin sealants. The aim is to evaluate the school-based integrated fissure sealant programme, looking into the retention rate of the sealants in terms of upper and lower molars and materials used, and also to look into the caries outcome of the teeth. The sealants were reviewed yearly from 2004 to 2007. Four hundred and one children with a total of 620 fissure-sealed teeth were involved in the study. A total of 268 teeth were sealed with GIC while 352 were sealed with resin-based fissure sealants. Results from the study demonstrated that retention rate of resin-based sealants is better than GIC sealants, whereby, at the end of the 5-year study, 55.4% of resin sealants were found to remain completely intact while for GIC only 3.8% remained intact. About 18% and 11% respectively of the GIC-sealed and resin-sealed teeth became carious at the end of the study. Of the carious or restored molars, more were found in the lower molars than in the upper molars, 14.3% and 11.4% respectively. Caries risk assessment is an important component in case selection and in clinical decision-making. As the resin sealants are more durable they are generally preferred, while GIC should be used in cases where moisture control is difficult, e.g. in erupting or newly-erupted teeth, especially among high caries risk individuals and in settings where control of moisture is difficult. This is particularly so, in the mobile school-based setting.

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FISSURE SEALANT EVALUATION AMONG PRIMARY SCHOOLCHILDREN IN KELANTAN

Asmani AR, Habesah S, Azizah M

Introduction: Dental caries is a chronic disease which poses significant public health problems all over the world. The use of fissure sealants is a cost-effective tool for occlusal caries prevention. **Objective:** This study explored fissure sealant retention and the associated factors of sealant failure among schoolchildren in Kelantan. **Methodology:** A longitudinal study was conducted involving 420 Standard Two schoolchildren in Kelantan. The schoolchildren were rendered initial application of fissure sealant in the year 2003 and were reviewed yearly till the year 2007. Data pertaining to socio-demographic characteristics, facilities, materials used and fissure sealant status were captured using *Appendix 2: Format for oral examination* of *Evaluation of the School-based Integrated Fissure Sealant Programme: A longitudinal study.* Data was entered and analysed using SPSS version 12. Descriptive statistics were presented by frequency and percentage while associated factors of fissure sealant failure were determined using chi-square test. **Results**: Of 420 schoolchildren, 310 (74%) were followed up till 2007. Two hundred and eight schoolchildren (67.1%) were from Kota Bharu and 102 (32.9%) from Pasir Mas. The majority were females (55.2%) and Malays (281, 90.6%). Most of them were rendered treatment by mobile team (229, 73.6%). Of the 310 students, 480 first permanent molar teeth were sealed. The majority were lower first permanent molars (440, 91.7%) and most were sealed with GIC (292, 60.8%). The sealant retention rate decreased dramatically from 36.4% in the second year to only 2.9% in the 5th year. Sealant failure was significantly higher in treatment rendered by mobile team (148, 41.9%) compared to those done in the dental clinic (18.9%; $p < 0.001$). The failure rate with GIC was also higher (126, 43.2%) compared to resin (24.5%; $p<0.001$). **Conclusion**: Fissure sealant retention among cohort schoolchildren in Kelantan was low. This was associated with type of facilities and materials used.

Keywords: fissure sealant retention, caries prevention

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COSTING DENTAL RESTORATIONS IN PUBLIC SECTOR DENTAL CLINICS

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The objective of this study is to share cost-analysis methodology and to obtain cost estimates for posterior restorations in public sector dental clinics. Two urban and 2 rural dental clinics in Selangor state were selected. Only cases of 1 posterior restoration per visit by dental officers over a 6-month period were included. One capsulated amalgam type, 1 capsulated tooth-colored, and 1 non-capsulated tooth-colored material were selected. A clinical pathway form was formulated to collect data for each patient. Annual capital and recurrent expenditures were collected for every clinic. The mean cost of an amalgam restoration was RM 30.96 (SD RM 7.86); and that for tooth-colored restorations ranged from RM 33.00 (SD RM 8.43) to RM 41.10 (SD RM 10.61). [Wherein 1 USD = RM 2.8]. Restoration costs were 35% to 55% higher in clinics in rural areas compared to urban areas. The findings demonstrate economy of scale for clinic operation and restoration costs with higher patient load. Costs per restoration were higher in rural than in urban dental clinics. More studies are recommended to address the dearth of dental costs data in Malaysia.

Keywords: costs, dental restorations, public sector, Malaysia

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RESEARCH
IN
EPIDEMIOLOGY

THE PREVALENCE OF VICTIMS INVOLVED IN MOTOR VEHICLE ACCIDENTS ATTENDED TO AT BATU PAHAT DENTAL CLINIC IN 2008

Maisarah ZA, Azlita N, Nurul Zatil AI

Objectives: This retrospective study aims to document the prevalence of victims involved in motor vehicle accidents (MVA) and pattern of maxillofacial injuries sustained; to determine demographic and injury characteristics; as well as the immediate treatment provided to the victims. **Methodology:** Patient records from January 2008 to December 2008 were selected and reviewed. Data associated with demographics, aetiology of injury, types of injuries whether soft tissue or hard tissue and treatment modalities were collected. Descriptive analysis was done using Microsoft Excel Windows version 2007. **Results:** A total of 139 MVA victims were reviewed by dental officers in Batu Pahat Dental Clinic during the one-year period. Most of the patients seen were Malay males (105, 76%) who sustained more injuries compared to women (34, 24%) with ratio of 3.1:1. The occurrence of injuries was mostly seen among the age group of 11-20 years (49, 35%). The highest number (17, 12.3%) of MVA cases were reported in the month of August, occurring mostly on weekdays (106, 76%) and involving motorbikes (85, 49%). Soft tissue injuries (131, 94.2%) are the most common. The mandible was the most common bone to fracture (86, 61.9%) with the parasymphysis being the most common site. Toilet and suturing (50, 30%) of the wound was the commonest immediate treatment provided to the victims. **Conclusion:** MVA are the most common cause for maxillofacial injury. These results indicate the high incidence of dental and facial trauma, and suggest the importance of adopting appropriate prevention protocols and effective therapeutic methods.

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PSYCHOSOCIAL IMPACT OF ORO-FACIAL PAIN AND DISCOMFORT AMONG FORM FIVE SCHOOLCHILDREN

Doreyat J

Objectives: The objectives of this survey are to compare the prevalence of oro-facial pain in relation to other bodily pain, to determine the type, severity and causes of oro-facial pain and discomfort and also to determine the psychosocial impact of oro-facial pain and discomfort. **Methodology:** This is a cross-sectional study where 4 secondary schools were selected by simple random sampling. All the form five schoolchildren from the selected schools were involved in this study. Subjective data on oro-facial pain were collected through a self-administered questionnaire. **Results:** About 42% of subjects reported suffering from oro-facial pain in the previous 4 weeks. Oro-facial pain was the third most common pain condition affecting schoolchildren after headache (46.3%) and stomachache (44.4%). The prevalence of reported oro-facial pain and/discomfort in the past 4 weeks was about 66.1%. The three most common self-reported oro-facial pain was sensitivity to hot/cold (34.9%), ulcer (30.1%) and pain in the jaw while chewing (13.8%). However the majority felt that it was only of mild (65%) or moderate intensity (29.2%). Hence, the majority (67.9%) did not do anything about it. Of those who had pain and discomfort over the past 4 weeks, the most common impact reported were felt worried (31.7%), felt tension (21.9%), and interrupted sleep (21.3%). In the overall sample, 1 in 10 students said that their concentration in studies was affected by the oro-facial pain and discomfort. **Conclusion:** It is concluded that oro-facial pain and discomfort has a significant psychosocial impact. Emphasising the impact of oro-facial pain and discomfort will create greater oral health awareness and the public's perception of the value of oral health.

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NATIONAL ORAL HEALTH SURVEY OF 5-YEAR-OLD PRESCHOOL CHILDREN 2005 (NOHPS 2005) PERAK REPORT
ORAL HEALTH STATUS AND TREATMENT NEEDS

Bibi Saerah AK, Noor Rohana K, Law CH, Rokiah M

This cross-sectional survey data was extracted from the National Oral Health Survey of Preschool Children in 2005. It involved 1,355 randomly selected 5-year-old preschool children from various categories of kindergartens in Perak. The aim was to determine their oral health status and treatment needs. The caries prevalence was 66.1%, being almost similar in both the boys (67%) and the girls (65%). The percentage of children with caries-free mouth (dmft=0, DMFT=0) was 33.9%. The highest proportion of treatment need for two-surface restorations was on upper and lower deciduous molars. The highest treatment need for upper central deciduous incisors was extraction. Asymptomatic carious posterior teeth were retained as 'space maintainers'. Only 0.91% of 1,423 erupted permanent teeth required restoration. The prevalence and severity of dental caries was still high among 5-years-olds in Perak. It is therefore recommended that priority should be given to restore all carious deciduous molars to reduce their early loss. Painless preventive dental procedures such as the application of fluoride varnish should be re-emphasised for 5-year-olds.

Keywords: oral health status, treatment needs, 5-year-old preschool

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ORAL HEALTH STATUS OF 5-YEAR-OLD PRESCHOOL CHILDREN IN JOHOR

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Objective: This report describes the oral health status and treatment need of 5-year-old children in Johor in the year 2005. It was generated from a sub-set of data from the National Oral Health Survey of Preschool Children (NOHPS) 2005. **Methodology:** A cross-sectional and multiple-stage stratified random sampling method was used. Clinical examinations were performed by two trained and calibrated examiners according to the WHO basic methods for dental caries and treatment needs assessment. BASCD criteria were used to assess oral hygiene status. **Results:** Of the 1,929 children examined, 61.0% were affected by dental caries but distribution of dental caries experience was highly skewed. Mean caries experience was 3.46 dmft (decayed, missing and filled teeth), with decayed teeth (3.27) being the highest component. Mean decayed permanent teeth was 0.01 with no filled and missing permanent teeth. About 72.1% of children were found to have clean teeth, 25.9% had little plaque and 2.2% had substantial plaque. As for treatment needs in deciduous dentition, 783 (40.6%) subjects needed some type of treatment, 753 (39%) needed restorations and 90 (4.7%) needed dental extraction. For permanent dentition, 447 subjects had erupted permanent dentition and of these, 10 subjects needed restorations. Significant differences in caries prevalence (p=0.000) and caries experience (p=0.000) were found among the ethnic groups, with Malays recording the highest level of dental decay. Similarly, significant differences in dental caries prevalence (p=0.001) and caries experience (p=0.000) were found between urban and rural preschool children with rural children having poorer oral health status. No significant differences in dental caries prevalence (p=0.376) and caries experience (p=0.134) were seen between genders. The incidence of cleft lip and cleft palate was 1:964. **Conclusion:** The prevalence of dental caries in 5-year-old preschool children in Johor was high (61%) with a mean dmft of 3.46. The distribution of dental caries was highly skewed. There were significant differences in caries prevalence and caries severity among ethnic groups and between urban and rural children. High unmet treatment needs were observed. Oral health promotion targeted at parents/caregivers need to be started as early as possible. Oral health strategies need to be reoriented to reduce oral health inequalities.

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CARIES IN 5-YEAR-OLDS IN MALAYSIA

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Objective: The Malaysian oral health survey on 5-year-olds in 2005 (NOHPS 2005) assessed caries prevalence and severity for the country's oral health profile. **Methodology:** A cross-sectional two-stage systematic sampling design stratified by location was used, with probability proportionate to size. A total of 16,192 children were recruited; data was weighted for an estimated 573,000 population. **Results:** Males comprised 50.9%, with the majority of population (60.4%) in urban areas. The major ethnic groups were Malays (59.8%), Chinese (20.7%), and Indian/Pakistani (5.0%). Caries prevalence was 75.7% (95% CI 74.14-77.22). Mean dmft was 5.57 (95% CI 5.36-5.79), with disparity by location (urban 4.52; 95% CI 4.25-4.79; rural 6.91; 95% CI 6.91-7.51) and by ethnic group – best in the Indian/Pakistani group (mean dmft 1.82; 95% CI 1.52-2.12) and worst in the Malays (6.10; 95% CI 5.89-6.31) and Indigenous groups (8.07; 95% CI 7.69-8.44). Decayed teeth were largely unrestored (mean 'd' 5.2; 95% CI 5.04-5.45); with mean 'f' at 0.21 (95% CI 0.16-0.26). The majority (61.2%) had dmft $\geq$3, with 24.8% having dmft $\geq$10. About 27% had permanent teeth (mean 3.2, range 1-12), 4.6% with DMFT>0. **Conclusion:** Caries control in young children continues to be a major challenge, and there is slight improvement from baseline 1995 data despite a preschool preventive programme. Malaysia grapples with appropriate population approaches for very young children, weighing pragmatic dental care for the dentition against the wider need to ensure children's continued long-term acceptance of such care.

Keywords: caries, children, 5-year-olds

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DEVELOPMENT OF JOHOR GERIATRIC ORAL HEALTH-RELATED QUALITY OF LIFE INDEX

Muz'ini M, Noridah A, Habibah Y

Objective: To develop an oral health-related quality of life measure for the elderly population in Johor and to validate it on a sample of elderly subjects aged 60 and above. **Methodology:** Physical, social and mental well-being health dimensions were incorporated in a questionnaire. The scale had 5 scoring points. Field testing was conducted among 30 respondents aged 60 years and above from the Sri Kenangan Institution for the elderly in Johor Bahru and elderly patients from Bandar Tenggara and Bukit Besar health clinics in Kota Tinggi. **Results:** Principal component analysis and factor analysis were used to derive acceptable reliability and a good construct validity of the scale for each health dimension. The final questionnaire contained 12 items, four for each dimension. Cronbach`s alpha for physical, mental and social well-being dimensions were 0.918, 0.935 and 0.921 respectively. **Conclusion:** This project provides evidence for the reliability and validity of the measures in the Johor geriatric oral-health-related quality of life questionnaire.

Keywords: oral health-related quality of life, reliability, validity

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RESEARCH
IN
HEALTH AND SAFETY

AN EVALUATION OF THE EFFICACY AND EFFECTIVENESS OF A PREVENTIVE MAINTENANCE PROTOCOL ON THE QUALITY OF WATER FROM DENTAL UNIT WATERLINES AND DENTAL SUCTION SYSTEMS – A PILOT STUDY

Muz'ini M, Ramalingam SR

Objective: To evaluate the efficacy and effectiveness of a Preventive Maintenance Protocol (PMP) to control bacterial biofilm in dental unit waterlines (DUWL) and dental suction systems (DSS). The PMP intervention aimed to reduce the number of pathogenic living organisms which posed a health risk to immune-suppressed/compromised patients. **Methodology:** This was a cross-sectional study which involved three dental units at the Kota Tinggi Main Dental Clinic. Eight sampling sites were selected per unit. The independent water reservoirs were stored in an inverted position and refilled with fresh distilled water the next morning. Time dependent flushing was carried out for dental unit waterlines. Periodic disinfection was done for DSS. Microbiological examination was done to determine the number of colony-forming units (CFU) per millimeter (ml) of water. **Results:** All water samples from DUWLs were within standards of less than 200 colony-forming units (CFU) per ml water following intervention. Samples of dental suction system showed reduction in CFU following disinfection but not within the standards required. **Conclusion:** The Preventive Maintenance Protocol was found to be effective in maintaining microbiological quality of water within the standards of less than 200 CFU per ml in dental unit water. Periodic flushing of DSS also reduced the number of CFU in the biofilm matrix. Further research is necessary to determine effectiveness of chemical disinfection to reduce bacterial contamination of DSS to acceptable standards.

Keywords: dental unit waterlines, dental suction systems, preventive maintenance protocol

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STERILISATION PRACTICES IN SCHOOL MOBILE DENTAL TEAMS, MINISTRY OF HEALTH MALAYSIA

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Objective: This paper describes the use of autoclaves and other alternative sterilisation practices in mobile dental teams, Ministry of Health Malaysia. **Methodology:** A questionnaire survey was conducted to gather information on availability and use of autoclaves, packaging of sterilised instruments as well as use of alternative sterilisation methods in current functioning mobile dental teams in Ministry of Health Malaysia in the year 2007. Data were entered into Epi Info Version 10 and transferred to SPSS Version 13 for analysis. **Results:** The mean number of autoclaves per mobile dental team was 0.95 (ranged from 0.06 to 2.5) with seven states having at least one autoclave per mobile dental team. Instruments were packed into sterilisation pouches (range from 21.1% - 86.8%). Alternative sterilisation used were either hot water steriliser or chemical solutions especially in remote areas such as in Sarawak (112/115 mobile dental teams). **Conclusion:** Provision of adequate number of autoclaves for mobile dental teams is imperative to improve sterilisation practices.

Keywords: sterilisation, autoclaves, mobile dental teams

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COMPLIANCE TO INFECTION CONTROL PROCEDURES IN MOBILE DENTAL TEAMS IN KUALA KANGSAR DISTRICT, PERAK DARUL RIDZUAN

Suhailiza S, Noor Rohana K, Nur'Adilah AO

Introduction: The mouth carries a large number of potentially infective micro-organisms. It is therefore essential that dental healthcare workers operate cross infection control procedures to minimise the risk of infection passing from patient to patient, from patient to team members or vice versa. **Objective:** This study was carried out to evaluate the compliance to infection control procedures within the Mobile Dental Teams in Kuala Kangsar District, Perak. **Methodology:** In order to evaluate the extent of compliance to the infection control procedures, two separate audits were carried out on all Mobile Dental Teams in Kuala Kangsar District. There were six Mobile Dental Teams and the audits were carried out by "cross-audit" between the teams. The extent of compliance to infection control procedures was based on the cumulative percentage score obtained from the nine categories in PK KKP 1B form. **Results:** During the first audit, it was found that Team 3 showed the highest level of compliance (94.1%). However, the other five teams also comply highly with the infection control procedures and scored in the range of 80.2% to 84.1%. All the teams showed improvements in the second audit ranging from 0.8% to 10.9%. Team 3 still scored the highest (94.9%) with Team 2 the lowest (83.6%). Team 3 was observed to have the highest level of compliance to infection control procedures in all the nine categories. The most dramatic improvement especially in complying with storage procedure, work practice control and environmental infection control was found in Teams 1 and 5. However, Team 4 showed a decline in the level of compliance to elements of occupational exposure prevention and sterilisation and disinfection of patient care items. It was found that compliance to sterilisation procedure and work practice control was not satisfactory during the second audit in Team 6. Infection control procedures must be followed diligently during any dental procedure regardless of the place where they are conducted. **Conclusion:** This study showed that the mobile dental teams are capable of maintaining high level of compliance to infection control procedures even though not in an ideal clinic set-up. In this era of globalisation and the emergence of more virulent strains of organisms, it is imperative for every dental personnel to practice standard precautions and effective infection control procedures at all times. Auditing is a quality measure to monitor compliance, identify weakness and ensure continuous improvement to infection control procedures. This would ensure that clients receive quality oral healthcare in a safe environment for providers and clients alike.

Project reported to the Oral Health Division, Ministry of Health Malaysia

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RESEARCH
IN
BEHAVIOURAL ASPECTS
IN RELATION
TO ORAL HEALTH

A SURVEY OF ORAL HEALTH KNOWLEDGE, PERCEPTION, UTILISATION OF DENTAL SERVICES, ORAL HYGIENE PRACTICES AND DIETARY HABITS AMONG THE CARIES GROUP OF SCHOOL CHILDREN AGED 9 TO 11 YEARS OLD IN THE DISTRICT OF MUAR, JOHOR

Habibah Y, Wong PY, Saliana AA

Objectives: To assess the oral health knowledge, oral hygiene practices and dietary habits among 9 to 11-year-old schoolchildren in relation to their caries experience (DMFT), to determine their perception and utilisation of dental services and also to identify the food sold in the school canteens. **Methodology:** This was a cross-sectional study, involving 400 school children aged 9 to 11 years old, selected randomly from the caries group. Data was collected using a structured questionnaire and caries experience (DMFT) was reviewed based on their dental treatment records. **Results:** Only one third (34.5%) of the selected students had a high level of oral health knowledge even though 97% of them admitted that they receive yearly dental examination and education from the dental personnel. About 57% of them were afraid of dental treatment and seek dental care only when pain occurred. The majority of these schoolchildren (86%) brushed their teeth twice or more per day, using fluoridated toothpaste. More than 50% of the participants brought their food and drinks from home, the most frequent being fried rice, bread, Milo and syrup. A high proportion of participants had snacks between meals and the types of snacks taken were bread (75%), cakes (57.8%), biscuits (53.5%), chocolates (34%) and carbonated drinks (31.5%). The most common food sold in the canteen was burgers and nuggets. **Conclusion:** This survey revealed that a thorough assessment of schoolchildren`s snacking habits and their perception towards oral health services including examination and oral health education are required.

Keywords: oral health knowledge, dental fear, oral hygiene practices

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PRESCHOOL CHILDREN'S DRINKING AND SNACKING PATTERN IN GOVERNMENT KINDERGARTENS

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Objectives: The objectives of this study are to assess the baseline patterns of drinks and snacks consumption amongst preschool children in government kindergartens in Johor Bahru District, Johor, Malaysia by developing a questionnaire to assess the drinks and snacks consumption and also to review the existing policy or guideline implementation of healthy eating in kindergartens. **Methodology:** It was a cross-sectional study involving 52 government kindergartens in Johor Bahru. A self-administered questionnaire was used in this study. **Results:** This study showed that 94% of the kindergartens involved provided Milo drinks followed by powdered milk (82.7%). The favorite snacks provided are biscuits, 82.7% followed by bread with butter at 53.3%. Most of the kindergartens/parents provided unhealthy, non-nutritious food and high sugar-content food and drinks during special occasions with 74.3% providing birthday cakes followed by Briyani rice 51.4% and sweets and chocolates (78.1%). Eighty seven percent of kindergartens have no restrictions on foods and drinks brought from home. Out of 51 kindergartens, 88% reported having a verbal and written policy but 37% of these do not know who prepared the policy. However, 55.6% said they followed KEMAS guidelines. Ninety two percent of kindergartens reported no parent involvement in policy but 63.5% claimed parents could read the policy in kindergartens. In most kindergartens there is little evidence of any policy on healthy eating and there was ambiguity in the guideline on food and drinks prepared. **Conclusion:** Most of the snacks and drinks brought from home are unhealthy. The results showed that there is not much difference regardless of whether the kindergartens have a policy on healthy eating or not.

Poster presentation at Quality Initiatives & 1st Johor Oral Health Research Conference, 10-11 June 2009 at Sultan Ismail Hospital, Johor Bahru

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A 5-YEAR RETROSPECTIVE STUDY ON NEW ATTENDANCES OF ANTENATAL MOTHERS TO GOVERNMENT DENTAL CLINICS IN PONTIAN DISTRICT

Irna I, Roslinda AS

Objective: This study aims to identify the trend of new attendances of antenatal mothers from 2004 to 2008 and its contributing factors in Pontian District. **Methodology:** A convenient sample of antenatal mothers was used in this study. Data was collected from questionnaires distributed to a convenient sample of 190 mothers, as well as annual reports and workload returns. **Results:** An increasing trend of new attendances of antenatal mothers was noted from 5.5% (2004), 39.8% (2005), 68.4% (2006), 78.3% (2007) to 86.3% in 2008. Four factors were identified that contribute to the trend, which are Mother and Child Health Clinic (MCH), operator, facilities and patient's factors. Remedial actions were taken in 2008 based on these factors. Active participation from the Health Department and MCH Clinic in referring new attendances of antenatal mothers to dental clinics increased the new attendances of antenatal mothers. Scheduled visits were planned involving all dental officers including first-year dental officers (FYDOs) with approval from Senior Dental Officer. Oral health talks for pregnant mothers were also carried out in MCH Clinic to increase antenatal mothers' awareness. Monthly visits to facilities without dental officers were carried out by dental officers from the nearest dental clinics. Antenatal mothers were also given priority for check-ups in dental clinics and fast-lanes were created for them at all counters. The new attendances of antenatal mothers increased from 78.3% in 2007 to 86.3% in 2008 which exceeded the target set of more than 85%. **Conclusion:** This study indicated that many factors contributed to the new attendances of antenatal mothers in dental clinics. Active participation from all parties is required to ensure that antenatal mothers utilise dental facilities fully.

Poster presentation at Quality Initiatives & 1st Johor Oral Health Research Conference, 10-11 June 2009 at Sultan Ismail Hospital, Johor Bahru

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LEVEL OF AWARENESS ON THE IMPORTANCE OF PRIMARY DENTITION AMONG MOTHERS WITH TODDLERS ATTENDING THE MATERNAL AND CHILD HEALTH CLINIC (MCH) IN RAUB

Mohamad Khairul Hafizan MN, Noraziah MZ, Rozita B

The National Oral Health Plan for 2010 targets 30% of all 6-year-olds with caries-free dentition by 2010. In order to achieve this target, early prevention especially at the toddler stage is needed. The authors would like to focus on the level of awareness on the importance of the primary dentition among mothers with toddlers in the district of Raub. A cross-sectional study was conducted for 2 months. Self-administered questionnaires were distributed among the 7 MCH in the district of Raub after obtaining necessary approvals. Respondents were Malaysian mothers and sampling was done in which every 2nd mother was chosen as a respondent. The level of awareness was calculated by proxy from responses in section B of the questionnaire and was expressed in percentages. Data were analysed by SPSS version 15. The mean level of awareness among respondents is 73.1%. Maternal level of education, occupation of the mother and the manner in which the mother was exposed to oral health information were significantly associated with the level of awareness. Statements regarding functions of primary dentition had poor responses while statements regarding primary dentition care scores highly. Exposure to oral health information via mass media has no significant correlation with level of awareness.

Project reported to the Oral Health Division, Ministry of Health Malaysia

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CORRELATION OF ORAL HEALTH PERCEPTION AND ORAL CARE PRACTICES WITH CARIES EXPERIENCE AMONG SCHOOLCHILDREN IN RURAL AREAS OF JERANTUT, PAHANG

Sia JY, Kalsom I, Norhafizah MH

Introduction: Oral health means more than good teeth; it is integral to general health and essential for well-being. The key challenges of dental health in rural or remote areas are ensuring access for people in need and providing people, wherever they live, with options which suit their particular circumstances. **Objectives:** To correlate oral health perception and oral care practices with caries experience among primary schoolchildren in Ulu Tembeling, Jerantut and to correlate interest of profession with caries experience. **Methodology:** Cross-sectional survey using a guided questionnaire was conducted. Universal sampling of 5 schools in Ulu Tembeling with 70 study subjects and their annual dental records (card LP8) were retrieved to assess dental caries. **Results:** Around half of the study subjects (49%) have good oral health perception and 37% have good oral care practices. A majority of 96% of them have DMFT and dft less than 3. Seventy percent of them were unsure whether they are interested in the dental profession. **Conclusion:** No statistically significant correlations between oral health perception, oral care practices and interest with caries experience were found. Collaborative efforts involving all parties to improve oral health for the community in rural areas are recommended.

Project reported to the Oral Health Division, Ministry of Health Malaysia

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LEVEL OF KNOWLEDGE, ATTITUDE AND PRACTICE RELATED TO TOOTH WEAR AMONG 16-YEAR-OLD SCHOOLCHILDREN

Bibi Saerah AK, Noorliza Mastura I, Naing L, Abdul Rashid I

Objectives: To validate the knowledge (K), attitude (A) and practice (P) questionnaire and to determine and compare (KAP) scores on tooth wear among 16-year-old schoolchildren. **Methodology:** This case-control study involved 576 (460 cases and 116 controls) 16-year-old schoolchildren randomly selected from secondary schools in Kota Bharu, Kelantan. A self-administered questionnaire was used to capture socio-demographic profile of the family, KAP and associated variables for tooth wear. The questionnaire was developed based on expert opinion and was piloted twice among 16-year-old secondary schoolchildren. The Smith and Knight Tooth Wear Index 1984, was used to record tooth wear during oral examination. **Results:** All participants were Malays. The item analysis of KAP questionnaire showed fairly good internal consistency reliability and construct validity. The K, A and P scores vary widely from 0-100% among cases and controls. However the mean score differences were all less than 1 mark between them. Comparison of KAP scores by using t-test revealed no significant difference between the two groups. **Conclusion:** The KAP questionnaire was validated and the scores vary widely among the participants. However the scores were not significantly different between the two groups. This study revealed that some of the participants still have very poor K, A and P scores regarding tooth wear. Therefore oral health education in schools should emphasise this matter.

Keywords: validity, knowledge, attitude and practice

Project reported to the Oral Health Division, Ministry of Health Malaysia

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PERCEPTION OF SCHOOLCHILDREN ON DENTAL NURSES IN SARAWAK: A COMPARISON BETWEEN THE RESULTS OF THE 2003 AND 2007 SURVEYS

Chen CJA, Ling KS, Eddy A, Fatimah I, Hong SL

Oral healthcare for schoolchildren is a priority in Malaysia. In Sarawak, more than ninety percent of primary schools are covered by dental nurses. In the delivery of the School Dental Service, the quality of oral healthcare provided is as important as the number of schools covered. This study aims to provide feedback on the perception of primary schoolchildren on dental nurses in Sarawak in the following areas: the quality of oral health services provided by the dental nurses, the acceptability of oral health promotion activities carried out, and the conduciveness of the school dental clinic. Year 6 schoolchildren from 129 primary schools in Sarawak with a school dental clinic were included in the sampling frame. Ten percent of the eligible schoolchildren were selected from these schools using systematic random sampling. A total of 1,692 schoolchildren participated in the 2003 survey, while 2,069 schoolchildren participated in the 2007 survey. Data was collected using a self-administered, structured questionnaire. Data analysis was done using EPI-Info 2002. The findings from this study indicate that the delivery of oral health services in primary schools has improved over the last four years. More schoolchildren felt that the dental nurses were friendly (94.0% in 2007 against 91.3% in 2003), were gentle when carrying out dental treatment (89.5% in 2007 against 87.7% in 2003) and spoke nicely to them, (95.5% in 2007 against 90.4% in 2003). More schoolchildren were happy with the school dental clinic and its surroundings (92.1% in 2007 against 90.5% in 2003). Overall, only 4.6% of the schoolchildren felt that the dental nurses were “not acceptable”, 13.9% felt the dental nurses were “acceptable” and 84.5% felt the nurses were “highly acceptable”. In general, a comparison between the findings of this study and a previous study in 2003 indicate that the delivery of oral health services in primary schools has improved over the last four years. Efforts should be made to ensure that the success of the present School Dental Service remains sustainable in future years.

Project reported to the Oral Health Division, Ministry of Health Malaysia

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TOOTH WEAR: THE INFLUENCE OF DIETARY INTAKE AMONG 16-YEAR-OLD SCHOOLCHILDREN

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Introduction: Tooth wear describes the non-carious pathological loss of tooth tissue, which results from attrition, erosion and abrasion that occurs singly or in combination. **Objective:** To investigate dietary intake patterns in relation to tooth wear and to determine the relationship between tooth wear and dietary intake. **Methodology:** This case-control study involved 576 randomly selected 16-year-old schoolchildren from a secondary school in Kota Bharu town. The Smith and Knight tooth wear index (1984) was used. Data were analysed using a simplified software program (Naing, 2004) based on the index to quantify pathological tooth wear. Controls were subjects with no pathological tooth wear indicated by zero scores on all tooth surfaces. Cases were subjects with pathological tooth wear having at least one surface scoring 1 for tooth wear. Data on the rate and frequency of consumption of drinks, foods and fruits were obtained from food frequency questions in the self-administered questionnaires. **Results:** Over 95% of the children consumed carbonated drinks. Less than 5% of the children consumed it twice per day. The method of drinking was not significantly related to tooth wear but the duration of intake of carbonated drinks, orange juices, certain sports and carbonated drinks and intake of dairy products were significantly associated with tooth wear (simple logistic regression analysis with p value<0.05). **Conclusion:** Most children consumed carbonated drinks daily but at low frequency. There were significant relationships between particular drinks and fruits with the amount of tooth wear. Further investigation of the erosive potential of these drinks and fruit is required.

Keywords: tooth wear, dietary patterns, schoolchildren, Smith and Knight Index

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FLUORIDE TOOTHPASTE UTILISATION BEHAVIOUR AMONG PRESCHOOL CHILDREN IN PERLIS, MALAYSIA

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Introduction: Very mild fluorosis is quite prevalent in children and one of the sources may be attributed to poor fluoride toothpaste utilisation habits. **Objectives:** To investigate the frequency of toothbrushing, parental supervision, the person who usually applied the toothpaste, toothpaste swallowing and spitting habits, size of toothbrush and type of toothpaste used and amount of toothpaste used by shape and weight. **Methodology:** This was an observational cross-sectional study of a representative random sample of 373 children aged 5-6 years old. The children were interviewed using a structured close-ended questionnaire. Direct observations were made on their toothpaste-dispensing habit during a toothbrushing exercise. **Results:** All children reported practising toothbrushing with 90% practising it on a daily basis. Almost all used fluoridated toothpaste (91.4%). About one-half (50.7%) reported that their parents never supervised them. More than one-third of children used adult toothpaste and 60.1% used flavoured toothpaste. Most of the children (92%) used toothbrush meant for children. About 40% applied a pea-sized amount of toothpaste. The mean weight of toothpaste applied was 0.43g (SD±0.35g). **Conclusion:** The majority used the recommended child-sized toothbrush and toothpaste that contained fluoride but less than one-half of the parents supervised their children. Most children used flavoured children's toothpaste but a sizable proportion used toothpastes meant for adults. The amount applied by shape and weight exceeded the amount recommended by experts.

Keywords: fluoride, fluorosis, preschool children, toothpaste

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RESEARCH
IN
CLIENT SATISFACTION

TO DECREASE THE WAITING LIST TIME FOR DENTURE TREATMENT

Rohana AB, Siti Zuraini M, Wahidah MJ, Siti Hariyana M, Julaila S, Suzita S, Mariam A

Loss of permanent teeth can cause serious impact to patients. It can give negative effects to a person including difficulty during eating or speaking, feeling uncomfortable and embarrassment in performing his/her daily activity. In order to restore function, the missing teeth can be replaced by dentures. The increase in demand for dentures led to the Denture Waiting List Book being developed. Data was collected from the Denture Waiting List Book and also from patients' feedback. Action for improvement has been taken which includes a strong commitment by the management and personnel, updating the waiting list, communicating with the patients and expediting the denture-making process. Denture output by the Dental Technologist increased and as a result, there was a reduction in the waiting list for denture treatment. Most of the patients were satisfied with the service because the waiting time had been shortened to less than 3 months. Standardisation and monitoring was done continuously at all the clinics in Kluang District from Jun 2005 to August 2005. As a result, there was no waiting list anymore for denture treatment. The Waiting List for Denture Treatment Book was closed officially on 1st September 2005.

Project reported to the Oral Health Division, Ministry of Health Malaysia

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TO REDUCE THE WAITING TIME FOR OUTPATIENT CLINIC AT TAMAN UNGKU TUN AMINAH DENTAL CLINIC

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Introduction: Outpatient service is one of the 'core businesses' of the dental service in Taman Ungku Tun Aminah Dental Clinic. It encompasses dental check-up, extraction, conservative treatment such as filling and preventive treatment such as scaling. **Objective:** In January 2009, the Waiting Time Study showed that 62.4% of outpatients received treatment within 60 minutes after registration. This percentage needs to be increased because the Quality Objective of the Johor Dental Services has targeted that 85% of outpatients will receive treatment within 60 minutes after registration. This problem has an impact on achievement of the Quality Objective of Johor Dental Services and also on the Clients' Charter agreement. Nevertheless, this problem can be overcome. **Methodology:** A retrospective study was conducted at the verification level and prospective study after the improvement action was taken. This study was done on the outpatients who attended the Taman Ungku Tun Aminah Dental Clinic. A Triage System was implemented at the registration counter and patients were divided into 2 treatment stations namely treatment station and conservative station. Data was analysed using Microsoft Excel. Percentage achievement for patient waiting time was analysed with the waiting time study. **Results:** An increment has been shown after the implementation of the Triage System in February 2009. The Waiting Time Study found that 95% of the outpatients had received treatment within 60 minutes after registration. **Conclusion:** The Triage System is implemented at the Taman Ungku Tun Aminah Dental Clinic. Client satisfaction of the patients who attended Taman Ungku Tun Aminah Dental Clinic has increased due to the improvement action.

Project reported to the Oral Health Division, Ministry of Health Malaysia

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ARE YOU MAKING THE RIGHT CAREER CHOICE?

Wan Mariam WAR

Objectives: To identify the causes of lack of interest amongst staff members in Miri Dental Clinic regarding their current posts. This study also served to identify the causes that led to average response by staff of Miri compared to standard set by state following the feedback from the internal customer satisfaction survey that was conducted in 2007 by the Oral Health Division, Sarawak. **Methodology:** The study was carried out by distributing self-administered questionnaires to all staff members which included dental officers, dental nurses, dental technologists, dental surgery assistants, attendants, drivers and clerical staff at Miri Division. Staff members from Marudi were excluded. The questionnaire forms were distributed and collected on the same day. **Results:** Out of 78 staff, 51**%** confessed that their current post is not their first choice. Forty two percent applied for the job because they did not have other choices. Forty-one percent chose the post because they would like to contribute their services to the community. A total of 38% are not satisfied with their current posts. Thirty three percent experienced stress frequently while 42% rarely experienced stress. Fifty percent are proud that they are in the service while the other half feels that they are just like any other government staff. Sixty-two percent of the staff members would like to change career given the chance. Ironically, 68% would like to recommend their posts to other people. The dissatisfaction was obvious amongst dental surgery assistants and drivers. **Conclusion:** Problems amongst personnel should be tackled from the beginning to avoid the condition from becoming chronic. Motivation should be given to staff members earlier to foster interest in their jobs and encourage them to try their best. The management should be sensitive to the situation in the work place and organise discussion sessions so that staff members will feel they are valued.

Project reported to the Oral Health Division, Ministry of Health Malaysia

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TO INCREASE THE PERCENTAGE OF PATIENTS SEEN BY DENTIST WITHIN 30 MINUTES AFTER REGISTRATION AT KOTA TINGGI DENTAL CLINIC TO 50%

Haliza T, Ramalingam SR, Nor Azmah B

The long waiting hours for treatment at government hospital / clinic can cause unsatisfactory reaction from the customer or patient. The congested waiting room indirectly affects the quality of service and image of the department. For this, the Minister of Health *Yang Berhormat Dato' Sri* Liow Tiong Lai urges all related divisions to improve the service by taking necessary actions to improve the waiting time to within 30 minutes for all outpatient clinics and hospitals. (*Surat Pekeliling Ketua Pengarah Kesihatan Malaysia Bil.* 2/2008). For the Kota Tinggi Dental Clinic (KTDC), insufficient outpatient days and insufficient dental officers on duty were identified as contributing factors. The measurement of the study is based on the improvement of waiting time for outpatients by increasing the 3 days a week for outpatient day with 1 officer on duty in 2008, to 5 days a week for outpatient day in 2009 with 2 officers on duty. Collection of data and study was done on the outpatient waiting time from January until December 2008. Another collection of data was carried out after remedial action in January until April 2009. All categories of outpatients (new and repeat) will fall under the inclusion criteria. This will exclude all appointment patients. The increase in percentage of patients getting treatment within 30 minutes before and after remedial action was determined. The collection of data after remedial action showed improvement from January to April 2009. The remedial actions and measures were found to be effective in achieving the target. The strategies for change include 1. All staff at KTDC including dental officers, first-year dental officers, dental nurses, dental surgery assistants and attendants were briefed on the changes. 2. Deployment of staff especially auxiliaries from Bandar Mas Dental Clinic. 3. Evaluation of the criteria for patients who needed appointments. 4. To strengthen the use of express counter for antenatal mothers. It is highly hoped that a significant improvement can be further achieved by December 2009. The scope should be broadened to include outpatient day twice a week for Bandar Mas/Sening Dental Clinic.

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A STUDY ON PATIENTS' WAITING TIME IN THE DENTAL CLINICS IN THE DISTRICT OF KUALA KANGSAR, PERAK

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Clients' Charter of dental clinics state that patients should be registered within 15 minutes and treatment waiting time should not be more than 45 minutes. The objectives of this study were to evaluate compliances to standard patients' registration time and treatment waiting time in all dental clinics in Kuala Kangsar, to determine non-conformance rate and to identify remedial action to be taken to improve dental services. This observational cross-sectional study was conducted in January till August 2007. Monitoring from treatment cards (LP8), registration book (PG 101 Pin 3/04) and PKPP-BK 32/ Pin 00 form showed that 100% of patients were registered within 15 minutes and 95.3% patients were treated within 45 minutes. A total of 3.5% of patients waited for more than 45 minutes but less than 1 hour. Only 1.3% patients waited more than 1 hour to get dental treatment. Sg. Siput Dental Clinic showed the highest rate of non-conformance in the district where 10.1% patients waited between 45 minutes to 60 minutes and 2.9% more than 60 minutes. This was because only one dental officer was on duty during outpatient day. Remedial action in having two dental officers on duty during outpatient day may resolve this problem.

Project reported to the Oral Health Division, Ministry of Health Malaysia

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STUDY ON PATIENT SATISFACTION ON ISSUED COMPLETE DENTURES IN TEMERLOH & BERA GOVERNMENT DENTAL CLINIC

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Introduction: The increasing demand for full dentures is related to the consistent increase in the elderly population in Malaysia. Dissatisfaction causes disappointment in both patient and dental practitioner. **Objective:** The purpose of this study is to measure patient satisfaction towards dentures issued in Temerloh and Bera Government Dental clinic by describing the socio-demographic factors and factors of denture quality influencing it. **Methodology:** This is a cross-sectional study involving 100 patients who completed treatment for full dentures. Questionnaires on socio-demographic factors and factors influencing patients toward their full dentures were distributed during the survey. PASW version 17 was used to analyze the data. **Results:** A total of 85% respondents were satisfied with their full dentures. Factors affecting patient's satisfaction were gender, comfort, pain, aesthetics, retention, mastication and speech ($P < 0.001$). Post-operative instructions given also relate to patients' satisfaction ($p<0.034$). Factors that do not influence patients' satisfaction were age, level of education, monthly income, pre-operative instructions and dietary advice after issuing the complete denture. **Conclusion:** Good quality of complete dentures, gender and post-operative instructions affect the level of patient satisfaction.

Project reported to the Oral Health Division, Ministry of Health Malaysia

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RESEARCH
IN
ORAL SURGERY, ORAL PATHOLOGY
AND
ORAL MEDICINE

APPROPRIATENESS OF REFERRALS FOR SURGICAL REMOVAL OF IMPACTED MANDIBULAR THIRD MOLARS BY DENTAL OFFICERS

Jeya Raman JS, Kanagaratnam SS, Lim YC, Suppiah P

Objective: To assess whether dental officers (DO) who referred patients for surgical removal of impacted mandibular third molars to Oral Surgery Department, Ampang Hospital (OSDAH) were following the current Ministry of Health Malaysia Clinical Practice Guideline (CPG). **Methodology:** A retrospective study was conducted on all patients who were referred to OSDAH for surgical removal of impacted mandibular third molars from government dental clinics. Patients who were referred from January 2008 until March 2009 were included in the study. Demographics, concordance of diagnosis and concordance in exact indication for surgical removal of impacted mandibular third molar between DO in government dental clinics and DO/Specialist in OSDAH and management of the referred patients were reviewed. All data were collected in a customised worksheet and descriptively analysed. **Results:** A total of 270 records were reviewed. The concordance of diagnosis of referred cases between DO from government dental clinics and DO/Specialist in OSDAH was 71.5%. Surgical removals of impacted mandibular third molars were done in 208 cases (77.0%) of which 72.6% had concordance in exact indication for surgical removal. Pericoronitis was the highest referral reason for removal (41.5%) whereas unrestorable caries and pulpal pathology were the commonest reasons for surgical removal at 55.8%. It was noted that 17.8% of the cases were inappropriate referrals. **Conclusion:** The majority of cases were appropriately referred, however improvement is possible by understanding and adhering to the CPG.

Keywords: impacted mandibular third molar, appropriateness of referrals, surgical removal

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A FIVE-YEAR RETROSPECTIVE STUDY OF DENTOFACIAL INJURIES AMONG PRESCHOOL CHILDREN IN MALACCA, MALAYSIA

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Objective: To determine the pattern of dentofacial injuries seen among preschool children in a public hospital dental service in Malacca, Malaysia. **Methodology:** The study was retrospective and based on records of children aged 0 to 6 years with dentofacial injuries who were seen in Malacca Hospital between 1 January 2002 and 31 December 2006. **Results:** Over the five-year period, 268 preschool children were seen and they made up 8.69% of the total number of dentofacial injuries seen in the hospital during that period. Males outnumbered females by a ratio of 1.8:1. Falls accounted for 83% of the injuries. Soft tissue injuries were the most common injury encountered (94%) with the lips being the commonest site of injury. Dental injuries were seen in 37% and bone fractures in 3% of the children. **Conclusion:** In the dentofacial area, soft tissues are the most commonly injured in young children. Dentists must be adept at managing soft tissue injuries in this group. The findings of this study differed in some ways from those conducted in other countries. The findings are useful for resource planning and prevention strategies.

Keywords: dentofacial injuries, preschool children, epidemiology, Malaysia, facial trauma

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INFECTIVE ENDOCARDITIS AFTER TOOTH EXTRACTION: A CASE REPORT

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Infective endocarditis is a rare but potentially fatal disease. Antibiotic prophylaxis for infective endocarditis prevention after invasive dental procedures has long been practised. Recently, in 2008, the National Institute for Health and Clinical Excellence (NICE) guideline recommended that antibiotic prophylaxis is no longer needed for prevention of infective endocarditis for dental procedures. This has created some confusion and controversy in management of such cases in the Malaysian setting. A case report of infective endocarditis occurring after tooth extraction in a patient with prosthetic heart valve is presented. This case occurred after extraction without antibiotic prophylaxis. The patient subsequently developed a mycotic aneurysm, a rare but fatal complication of infective endocarditis. A review of the case and the antibiotic guideline is discussed.

Keywords: infective endocardities, tooth extraction, guidelines

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MANAGING PATIENTS ON ANTICOAGULANTS – TENGKU AMPUAN RAHIMAH HOSPITAL, KLANG EXPERIENCE

Nurul Adha I, Abraham MT

Dental professionals are seeing a greater number of patients with medical problems. Common among them are patients on anticoagulants. Anticoagulants and antiplatelet medications are being prescribed for numerous conditions such as atrial fibrillation, venous thrombo-embolism episodes, following valve replacements or as prophylaxis against myocardial infarction episodes. These drugs alter homeostasis and thereby increase the risk of postoperative bleeding. In order to prevent such complications, one is forced to modify the anticoagulants and also the dental treatment given to the patient. These modifications are not without risk to the patient and in this presentation we look at the classical way we treat these patients. We also look at our experience of managing these patients on anticoagulants at Tengku Ampuan Rahimah Hospital, Klang.

Keywords: anticoagulants, warfarin, bleeding

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EMERGING TRENDS OF EXTRAPULMONARY TUBERCULOSIS – CASE SERIES

Thangavalu L, Abraham MT

Objective: The objective of this presentation is to increase awareness among dental healthcare professionals about the increasing trend of extrapulmonary tuberculosis. **Methodology:** Records of three patients diagnosed with extrapulmonary tuberculosis in the Oral and Maxillofacial Surgery Clinic of Tengku Ampuan Rahimah Hospital, Klang were reviewed. **Results:** In this presentation, we highlight two cases who presented at the Department of Oral and Maxillofacial Surgery Clinic at Tengku Ampuan Rahimah Hospital with submandibular lymphadenopathy and submental lymphadenopathy respectively. We also present a third case which presented with ulceration in the mouth. In all three cases, the patients did not present any classical symptoms of tuberculosis like low-grade fever, weight loss, night sweat or cough. Even routine investigations for pulmonary tuberculosis were equivocal. A high degree of suspicion is required in order to come to an accurate diagnosis. **Conclusion:** With the increased influx of migrant population from neighbouring countries, Malaysia is seeing an increased incidence of tuberculosis, especially the extrapulmonary variety. As dental healthcare professionals, it is important that we realise the increased incidence of this infectious disease and practise proper infection control as well as educate our auxiliary staff to ensure they too practise proper infection control procedures.

Keywords: extrapulmonary tuberculosis, diagnosis, infection control

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MAXILLOFACIAL TRAUMA AT TENGKU AMPUAN RAHIMAH HOSPITAL, KLANG – A 4-YEAR REVIEW (2005 – 2008)

Tiu SL, Ang KT, Yong PY, Tah GM, Abraham MT

Objective: The objective of this paper is to highlight the incidence of maxillofacial trauma in Klang and to look at the reasons why there is an increased incidence of maxillofacial trauma. **Methodology:** All the patients seen at the Oral Surgery (OS) Department of Tengku Ampuan Rahimah Hospital (TARH) from year 2005-2008 are included in this study. The exclusion criteria are incomplete records and patients below 16 years old who are seen at the Paediatric Dentistry Department, TARH and were not referred to the OS Department. The dental cards are the source of information. A data collection form was prepared to record all the necessary data. The results were analysed using SPSS version 14.0. **Results:** On an average, over 600 cases are seen yearly at the Oral Surgery Department of TARH. The majority of these cases are as a result of road traffic accidents. Of these, most patients are Malay males of the age range 18-30 years. Most patients sustained soft tissue injuries, followed by mandibular and maxilla fractures. A good number of patients are foreigners. After road traffic accidents, interpersonal violence is the second commonest cause of trauma. **Conclusion:** Road traffic accident (RTA) is the major cause of maxillofacial trauma in Klang and is on the rise. Young adults are the most prevalent group to be involved in RTA. Road safety education should be reinforced and targeted at this group. Interpersonal violence also plays an important role in maxillofacial trauma due to increasing crime rate. The high number of maxillofacial trauma involving foreigners is becoming a burden to local public health service.

Keywords: maxillofacial trauma, fracture maxilla, fracture mandible

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INCREASING PATIENT REGISTRATION AT THE COUNTER REGISTRATION CENTRE (CRC) BEFORE ATTENDING THE MAXILLOFACIAL SPECIALIST CLINIC, SULTAN ISMAIL HOSPITAL, JOHOR BAHRU

Mazlina MN, Wong TC, Suhilee A, Mohd Faizal R

Registration for patients attending the maxillofacial specialist clinic at the Sultan Ismail Hospital is done using the Total Health Information System (THIS). All patients who had been given appointments at the specialist clinic need to be registered at the CRC before attending the specialist clinic. A consultation charge of RM5 is paid during registration. Some patients with appointments at the Maxillofacial Specialist Clinic do not register at the CRC. Instead, they go straight to the clinic for treatment. However, treatment cannot be given if the patients have not been registered at the CRC. Therefore, they have to go to the CRC to register and by then, the CRC counter is usually busy. As a result, patients will receive treatment later than the appointment time. A prospective study was conducted at the verification level and also after the improvement action. At the verification level, the number of patients who did not register at the CRC was summed and their reason for not registering at the CRC was noted. In addition, data was also obtained from the questionnaire forms which were distributed to all patients who attended the Maxillofacial Specialist Clinic for appointment to identify the source of problems. After improvement action was taken, the number of patients who still failed to register at the CRC counter was summed. Data was analysed using Microsoft Excel and Microsoft Word. A total of 25 from 205 patients who had been given an appointment at the Maxillofacial Specialist Clinic failed to register at the CRC counter. From the questionnaire, a few factors were identified. After the improvement action, only 1.4% of patients failed to register at the CRC counter. The following activities were taken based on the factors identified: (1) Distributing information letter to all the Dental Clinics in Johor Bahru and all Departments at Sultan Ismail Hospital (2) Attaching reminder notes to the appointment cards of patients who attended the Maxillofacial Specialist Clinic (3) Emphasising to the person at the counter to give clear information to patients (4) Changing the location of information to an appropriate place which is more strategic and clear. After the improvement actions, the number of patients who did not register at the CRC counter decreased from 12.2% to 1.4%. Improvement action is done continuously to increase the service quality at the Maxillofacial Specialist Clinic.

Project reported to the Oral Health Division, Ministry of Health Malaysia

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AUDIT OF ORAL SQUAMOUS CELL CARCINOMA AT ORAL SURGERY CLINIC, SULTANAH AMINAH HOSPITAL, JOHOR BAHRU, JOHOR

Md Arad J, Ma BC

Objective: This study evaluates the pattern of oral squamous cell carcinoma seen and managed at the Oral Surgery Department, Sultanah Aminah Hospital, Johor Bahru. **Methodology:** This was a descriptive study of all oral squamous cell carcinomas cases. The records of patients diagnosed with oral squamous cell carcinoma in 2007 and 2008 were reviewed. Data analysed included age, gender, ethnic group, stage of cancer, and types of treatment done. **Results:** A total of 29 cases of oral squamous cell carcinoma were recorded between 2007 and 2008. The mean age was 60.7 years-old. Gender wise, males and females were almost equally affected. The Indian ethnic group made up 44.8% of the cases, followed by Malays (24.1%), Chinese (24.1%) and others (7.0%). The majority of patients (48.3%) have no risk factors. Betel quid chewing habit was found to be higher among the Indian ethnic group. The buccal mucosa was the most common site of oral squamous cell carcinoma (41.1%), followed by the tongue. Most of the cases presented at stage IV (62.1%) and the majority of the patients needed primary radiotherapy. Out of 29 patients, 9 were still alive and 9 patients had died. There were 11 patients of which their status were unknown due to loss of follow up. **Conclusion:** The majority of cases seen at this centre presented at stage IV. Oral cancer screening especially for the high-risk group should be carried out for early detection of oral squamous cell carcinoma.

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A RETROSPECTIVE STUDY OF MAXILLARY FRACTURES AT ORAL SURGERY CLINIC, SULTANAH AMINAH HOSPITAL, JOHOR BAHRU

Rosni MA

Objective: The aim of this study was to determine the incidence, aetiology, type, demography, treatment and complications of maxillary fractures managed at the Oral Surgery Clinic, Sultanah Aminah Hospital, Johor Bahru, Johor, during a 4-year period from 2003 – 2006. **Methodology:** Treatment cards of patients treated for maxillofacial injuries for the years 2003-2006 were reviewed. Only patients with maxillary fractures were selected for this study. All data including age, gender, ethnic group, type of maxillary injuries, aetiology, treatment methods and complications were entered into questionnaire forms for analysis. **Results:** There were 148 patients (10.1%) who had maxillary fractures over the 4-year period. The Malay ethnic group had the highest incidence of maxillary fractures (73%) as compared to other ethnic groups. The majority of maxillary fractures were seen in male patients (92%), aged between 21-30 years (47.3%). Motor vehicle accidents were the main cause of maxillary fractures (88.5%). The most common maxillary fracture, was Le Fort II fracture (101), followed by Le Fort I (31), Le Fort III (25) and dentoalveolar (23). More than half of all cases (56.8%) were treated by open reduction and internal fixation (ORIF). Complications occurred in 11.5% of patients. **Conclusion:** The findings of this study were similar to other reported studies, that motor vehicle accidents were the major cause of maxillary fractures. Strict enforcement and road safety education should be implemented, especially for young adults as they formed the highest numbers involved in road traffic accidents.

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PATTERN OF REFERRAL FOR MINOR ORAL SURGERY ON IMPACTED THIRD MOLAR CASES FROM DISTRICT DENTAL CLINIC IN NORTHERN JOHOR TO ORAL AND MAXILLOFACIAL SURGERY DEPARTMENT IN SULTANAH FATIMAH SPECIALIST HOSPITAL, MUAR

Nurliza AR, Rohana S

Objectives: 1) To assess the level of confidence and to evaluate the level of knowledge among dental officers in diagnosing and classifying impacted third molars. 2) To assess the reasons for referral of impacted third molar cases to Oral and Maxillofacial Surgery (OMFS) Department, Sultanah Fatimah Specialist Hospital (SFSH) Muar. **Methodology:** This cross-sectional study was carried out among dental officers working in the dental clinics of Northern Johor district (Segamat, Muar, Ledang and Batu Pahat). Dental officers attached to OMFS department, dental specialist officers (public health and orthodontist) and administrative officers were excluded. The questionnaire was formulated and distributed among the subjects. **Results:** A total of 31 dental officers participated in the study. Eighty four percent had referred minor oral surgery cases over the past 6 months to OMFS department in SFSH. Among them, 77.4% performed minor oral surgery procedures in their daily clinical work. It was found that 32.4% were very confident in diagnosing impacted third molar cases and 16.1% were very confident when classifying the impacted third molar cases. Meanwhile, 58.1% rate themselves at scale 4 for the level of knowledge to perform the procedure. The most common reasons for referral were the degree of difficulty anticipated in treating the impaction (77.4%) and lack of confidence in performing the procedure (41.9%). **Conclusion:** The majority of dental officers from district dental clinics referred impacted third molar cases to OMFS department even though they had the knowledge to diagnose and to classify the cases. Reasons for referring include the difficulty of the cases and lack of confidence in carrying out the procedure. Use of Clinical Practice Guidelines and continuing dental education regarding management of impacted third molar should be practised by dental officers in district dental clinics.

Keywords: impacted third molar, minor oral surgery, dental officers

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DISLOCATION AND IMPACTION OF MANDIBULAR CONDYLE FOLLOWING MANDIBULAR FRACTURES

Rohana S, Akmal R

Traumatic dislocation of mandibular condyles that went into middle cranial fossa, superiorly or superolaterally, have been reported previously. This case report described the rare condition of dislocation and impaction of mandibular condyle in a 19-year-old gentleman who was involved in a road traffic accident and sustained open fractures of the mandibular symphysis and parasymphysis. Initial clinical presentation noted the occlusion on the side of the affected condyle had posterior premature contact but normal occlusal relation on the contra-lateral side. The plain orthopantomogram did not reveal a significant difference of mandibular condyles. Intraoperative manipulation of the affected condyle was unsuccessful in reducing the open fractures and obtaining correct occlusion. Computed tomography (CT) scan imaging was then undertaken to investigate further. The 3D images clearly demonstrated the condyle position which was dislocated and displaced into superior and medial of the temporal spaces. The following operation was performed via hemi-coronal approach (Al-Kayat and Bramley) to gain access. Coronoidectomy was done and 0.5cm osteotomy of the zygomatic arch failed to reposition the condyle in the glenoid fossa. The fibrosis of the displaced muscles due to the delay of operation prevented the manoeuvre. Condylectomy was then done to bring the occlusion into an acceptable relation. This case report highlights the importance of advanced imaging modalities such as CT in diagnosing the condition. Proper planning and management appear to improve the prognosis.

Keywords: dislocation, impaction, mandibular condyle

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THE OUTCOMES OF NON-SURGICAL TREATMENT FOR CONDYLAR FRACTURES (MANDIBULAR DEVIATION AND OCCLUSAL RELATION) IN SULTANAH FATIMAH SPECIALIST HOSPITAL, MUAR: A RETROSPECTIVE STUDY

Rohana S, Nurliza AR

Objective: To evaluate the occlusal relation and mandibular deviation among patients who had non-surgical treatment for condylar fractures. **Methodology:** This retrospective study was carried out on 68 patients who sustained condylar fractures from January 2000 to December 2005. The demographic characteristics, causes of fractures, type of condylar fractures and its associated fractures and period of intermaxillary fixation (IMF) were taken from patient records. The assessment on mandibular deviation and occlusal relationship was done during recall assessment. **Results:** Twenty eight out of 68 patients attended the recall assessment, 23 were males and 5 females. The condylar fractures were commonly associated with symphysis/parasymphysis fractures (39.3%). Only 85.7% of patients received treatment which involved 32 condylar sites. The treatment included placement of arch bars followed by IMF using stainless steel wires of 0.05mm diameter for displaced fractures or orthodontic elastics of 5/16" (7.9mm) for minimally-displaced fractures. The mean duration of IMF was 14 days with 89.35% of patients having satisfactory occlusal relationship but 46.4% had mandibular deviation during mouth opening. A longer duration of IMF, (>30days) was found to be associated with limited mouth opening (<40mm). Those who had IMF for 14 days showed satisfactory outcome with mouth opening of more than 40mm, and no occlusal derangement or mandibular deviation while opening. **Conclusion:** The non-surgical treatment for condylar fractures seen in this centre showed satisfactory outcomes. However there is still a need to revise the current treatment modality and the follow-up rehabilitation exercise to ensure the success of treatment in future.

Keywords: condylar fractures, occlusal derangement, mandibular deviations

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OSTEOGENIC SARCOMAS OF THE JAW BONES: A 40-YEAR REVIEW OF 61 CASES

Ajura AJ, Lau SH

Objective: To determine the clinicopathological features of osteogenic sarcomas of the mandible and maxilla. **Methodology:** A retrospective study was carried out on all osteosarcoma cases diagnosed in the Stomatology Unit, Institute for Medical Research, Kuala Lumpur from 1967 to 2008. All the data regarding the age of presentation, gender, race, clinical presentation, radiographic findings and diagnoses were retrieved from computerised data. **Results:** There were 61 cases (38 males and 23 females) with age ranging from 7 to 68 years. The patients comprised of 29 Malays, 16 Chinese, 3 Indians and 13 of other ethnicity. There were 39 cases involving the mandible, 19 in the maxilla and in 3 cases the sites were not stated. The main complaint was painless bony swelling. Nine cases presented as numbness of the associated region. Four patients had history of prior radiotherapy and one patient had osteosarcoma of the right leg. The radiographic findings which varied from radiolucent to radiopaque lesions were mentioned in only 31 of the cases. **Conclusion:** Osteogenic sarcoma of the jaws is a rare malignant bone tumour. Over the 40 years, there were 61 cases diagnosed in our Institute and to date, this is the first study of jaw osteosarcomas in Malaysia.

Keywords: osteosarcoma, mandible, maxilla

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AN AUDIT OF 500 CONSECUTIVE CASES OF SURGICAL REMOVAL OF IMPACTED LOWER THIRD MOLARS

Dionysius DD, Lim LW, Royan SJ

Objective: To investigate the occurrence of complications following surgical removal of impacted third molars. **Methodology:** Five hundred consecutive cases of surgically removed impacted lower third molars carried out at Malacca Hospital from 1st January 2005 were evaluated. Information was obtained from patient records kept at Department of Oral Surgery, Malacca Hospital. Information related to age, gender, diagnosis, type of impaction, mode of anaesthesia and complications were recorded. Those cases where the patient failed to attend post-operatively were excluded from analysis. The rate of complications was compared to the other data collected. **Results:** A total of 500 cases were audited. Sixty one patients (12.2%) did not attend follow-up. Complications were seen in 53 of the remaining 439 patients (12.1%). Infection was the most common complication, seen in 32 cases (7.3%). Dry socket was noted in 16 cases (3.6%). Sensory deficit to the inferior dental and lingual nerves was seen in 5 (1.1%) and 3 (0.7%) cases. A significantly higher rate of complications was noted amongst women as compared to men (14.1%, 9.6%, p=0.047). Pre-existing pathology such as pericoronitis, caries and its sequelae were not significantly associated with a higher rate of post-operative complications. **Conclusion:** The complication rate from lower third molar surgery was 12.1%. Infection was the most frequently seen complication.The female gender was significantly associated with increased incidence of post-surgical complications.

Keywords: third molar surgery, complications, infection

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TOOTH FRAGMENT EMBEDDED IN THE LOWER LIP AFTER DENTAL TRAUMA: A CASE REPORT

Nuriah M, Royan SJ

The presence of tooth fragments embedded in soft tissue following trauma is uncommon. Complications such as infection and foreign body reaction may result when such fragments are not removed. In this report, a case is presented where a missed tooth fragment in the lower lip resulted in chronic infection. This case describes a patient who was involved in a motor vehicle accident and sustained a laceration wound. While palpating the tissue of the lower lip, we felt the presence of a foreign body. This was confirmed by a soft tissue radiograph of the lower lip that showed a radiopaque material, similar to a tooth fragment. It was surgically removed. Subsequently the lower lip wound healed uneventfully.

Keywords: tooth fragments, lower lip, dental trauma

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CALCIFYING EPITHELIAL ODONTOGENIC TUMOUR IN MANDIBLE

Norma J

A case of calcifying epithelial odontogenic tumour in the mandible presented at the Oral Surgery Department, Queen Elizabeth Hospital, Kota Kinabalu, Sabah. Calcifying odontogenic tumour, also known as Pindborg tumour, is rare and fewer than 200 cases have been reported in the literature. It commonly presents as a painless, slow-growing swelling in the mandible or maxilla. The tumour has bizarre microscopic features which can be mistaken for a poorly differentiated carcinoma microscopically. Long-term experience with this tumour is lacking and treatment varies from conservative curettage and enucleation to local resection. A recurrence rate of about 14% has been reported and tumours treated by curettage have the highest frequency of recurrence. This paper presents a case which was treated by resection and reconstructed using cancellous bone in a titanium mesh tray.

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AUDIT ON 'REJECTED' SPECIMENS SENT TO STOMATOLOGY UNIT, INSTITUTE FOR MEDICAL RESEARCH FOR YEAR 2007

Ajura AJ, Lau SH

Introduction: The Stomatology Unit, Institute for Medical Research, Kuala Lumpur is the main oral pathology diagnostic laboratory in the Ministry of Health Malaysia. Oral biopsy specimens are received each year from hospitals and dental clinics of both the public and private sectors in the country. **Objective:** As part of quality assurance of a histopathology laboratory, a few internal audits were carried out. One of the internal audits that were done in 2008 is to determine the number of specimens received in 2007 that were supposed to be rejected (however processed) and to identify the cause of the 'rejection'. **Methodology:** Rejected (however processed) letters (IMR/CaRC/STOMA/25/2511) which had been completed and returned to the sender were analysed. Specimens are considered being 'rejected' if the request form is incomplete, specimen is not submitted in the proper fixative or specimen is not properly labelled. **Results:** Out of 1,542 specimens received, 21 (0.01%) specimens were considered rejected; 12 specimen bottles were not labelled, 7 specimens were not submitted in the proper fixative, 1 request form was incomplete and in 1 case the specimen was not submitted in a proper fixative and the bottle was not labelled as well. For specimens without labelling; 3 cases were from Muar, 2 each from Sibu and Kuala Lumpur Hospital and 1 each from Paedodontic Johor, Kuala Terengganu, Kuching, Kluang and Paedodontic Ipoh. Out of 7 cases of which the specimens were not submitted in a proper fixative, 3 were from Seberang Jaya, and 1 each from Paediatric Institute, Sibu, Kuala Terengganu and Johor Bharu. **Conclusion:** Although the number of specimens that were supposed to be rejected is small, clinicians should be aware of the general procedure for submission of specimens for histopathological examination and the implications if procedure is not met.

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THE PATTERN OF MAXILLOFACIAL FRACTURES IN MINISTRY OF HEALTH HOSPITALS MALAYSIA

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Objective: To assess the pattern of facial fractures at 23 Malaysian hospitals. **Methodology:** A one-year prospective study was carried out. The data collected include age, gender, ethnicity, aetiology, sites of fractures and treatment. **Results:** A total of 2,101 fractures were found in 1,862 patients. Most fractures occurred in the age range 20 to 29 years old (mean 29.2, 642 cases, 34.5%). Men were more commonly affected (6 males: 1 female). Malays (62%) were the most commonly affected ethnic group followed by Indians (14.4%), Chinese (14.1%) and foreigners (5.9%). Most fractures were caused by road traffic accidents (RTAs) (79.59%), assaults (7.62%) and falls (6.50%). The majority of RTA cases involved motorcyclists. The commonest bones involved were the mandible (51.2%), followed by zygoma (23.6%), maxilla (19.8%), isolated orbital (3.9%), nasoethmoidal (19, or 0.9%) and frontal bone fractures (15, 0.7%). The commonest method of treatment used was conservative treatment (33.2%), followed by open reduction and internal fixation (31.5%), and closed reduction (29.6%). However, 4.7% of the patients refused treatment. **Conclusion:** Maxillofacial fractures as a result of RTAs are still very high and are usually associated with motorcyclists and pillion riders. Current preventive measures have little impact on the incidence of road traffic accident-related facial fractures in Malaysia.

Keywords: maxillofacial injuries, fracture, hospitals, facial bones, Malaysia

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CHROMOSOME ABERRATION TEST FOR HYDROXYAPATITE IN HUMAN OSTEOBLAST CELL LINE

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Objective: Hydroxyapatite is the major component and an essential ingredient of normal bone and teeth. Cell and tissue culture models make it possible for us to study the biological responses of cells to a wide range of stimuli in vitro right down to the molecular level. This study aims to find the possible mutagenic effect of synthetic hydroxyapatite (manufactured by *Universiti Sains Malaysia*, Penang) on chromosome of human osteoblast cell line. **Methodology:** Human osteoblast cell line (CRL 1543 – ATCC) was exposed to synthetic hydroxyapatite (5 mg), distilled water and Mitomycin C both with and without metabolic activation system at different time intervals. Colcemid was added to arrest cell division at metaphase. The cells were then washed in phosphate-buffered saline and trypsinised, followed by hypotonic treatment and fixation. The chromosomes were prepared, stained and analysed for chromosomal aberrations. **Results:** Mean (SD) mitotic indices of 4.88 (1.01) and 4.11 (0.99) percent were obtained for the treatment with hydroxyapatite without and with s9 for 6 hours respectively and 4.72 (1.13) and 4.96 (1.15) percent for direct treatment with hydroxyapatite for 24 hours and 48 hours respectively. Similarly, the mean (SD) mitotic indices were 5.16 (1.85), 4.75 (1.16) and 2.47 (0.82) percent respectively for the treatment with distilled water (with and without s9) and Mitomycin C (with s9) for 6 hours. Only cell lines treated with Mitomycin C exhibited chromosomal aberrations. **Conclusion:** Synthetic hydroxyapatite is non-cytotoxic and does not produce chromosomal aberrations in the human osteoblast cell line (CRL 1543).

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GENE EXPRESSION ANALYSIS OF OSTEOBLASTS SEEDED IN CORAL SCAFFOLD

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Objective: To examine the gene expression level of osteoblast specific genetic markers; RUNX2, osteopontin, ALP and osteocalcin from osteoblasts seeded in coral scaffold. **Methodology:** Processed coral scaffold were cut into 30mm in diameter disc. Osteoblasts were inoculated onto the coral in Dulbecco Minimum Essential Media (GIBCO, USA). The cells were trypsinised on Day 1, 7, 14, 18, and 21; added with RNALater for preservation of RNA in cells and kept frozen at-80^{o} until used. The RNA was extracted using RNA extraction kit, PureLink micro-to-midi (Invitrogen, Germany). The respective genes were amplified using RT-PCR kit (Qiagen, Germany) and analysed qualitatively on 1.5% agarose gel. The expressions were evaluated based on the intensity of band for different period of cell harvest. **Results:** RUNX2/Cbfa 1, osteopontin, ALP were expressed constantly from day 7 till day 21 by osteoblasts seeded in coral. Osteocalcin was expressed on day 14 and day 18. **Conclusion:** Increased expressions of the RUNX2/Cfba 1, osteopontin, ALP and osteocalcin genes prove that coral is a favorable carrier for osteogenetically-competent cells to attach and remain viable.

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SHED FROM PRIMARY MOLARS

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Objective: Stem cells from human exfoliated deciduous teeth (SHED) were discovered by a group of researchers in 2003. They exhibited an ability to grow much faster and doubled their population in culture at a greater rate, suggesting SHED may be in a more immature state than adult stem cells. The objective was to isolate stem cells from dental pulp of primary molars which can be used as a possible source for tissue engineering. **Methodology:** Human primary molars were collected from subjects aged 4-7 years old under standardised procedures. Within 24 hours, the tooth was cut at the cemento-enamel junction using a hard material cutter. The sectioned tooth was briefly immersed in 75% ethanol and soaked in Phosphate Buffer Saline. The pulp was separated from the crown and then digested in a solution of 3 mg/ml collagenase type I (Worthington Biochem, Freehold, NJ) and 4mg/ml dispase (Boehringer Mannheim) for 1 hour at 37^{o}C. Single-cell suspensions were obtained by passing the cells through a 70-um strainer (Falcon) and cultured with alpha modification of Eagle's medium supplemented with 20% Fetal Bovine Serum, 100 µM L-ascorbic acid 2-phosphate, 2 mM L-glutamine, 100 units/ml penicillin, 100 µg/ml streptomycin, and incubated at 37^{o}C in 5% CO2. The culture was observed daily under microscope. Immunohistochemistry confirmation was done using CD105 and CD166. Proliferative activity of SHED was determined using alamarBlue^{TM} kit. **Results:** The cell changes its shape from rounded to fibroblastic-like. Tooth pulp-derived progenitor cells were found positive for CD105 and CD166 (mesenchymal lineage markers), which are consistent with the finding for human mesenchymal stem cells (HMSC). Proliferative activity of SHED is higher compared to HMSC. **Conclusion:** A clonogenic cell population was isolated from dental pulp tissues and has high proliferative activity. Stem cells from dental pulp can be a possible source for tissue engineering in the future.

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PERIOPERATIVE ORAL ANTIBIOTICS IN THIRD MOLAR SURGERY: DO THEY MAKE A DIFFERENCE?

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Objective: To evaluate the usefulness of antibiotics in preventing post-operative infection in third molar surgery. **Methodology:** The study was retrospective with information obtained from patient records. The operations carried out by two surgeons in the course of two years were studied. In 2002, Surgeon A routinely prescribed Oral Metronidazole 400 mg tds post-operatively for five days (Group A02) whereas Surgeon B prescribed Oral Metronidazole 800 mg pre-operatively and 2 doses of 400 mg post-operatively (Group B02). In 2003, antibiotics were not routinely prescribed by either surgeon (Group A03 and B03). The proportion of post-operative infections seen in Groups A02 and A03 and that in Groups B02 and B03 were compared. **Results:** The number of infections in Group A02 was one out of 35 and in Group A03, two out of 43. Out of 36 patients in Group B02, there were no infections and in Group B03, it was three out of 43. However, using Fisher's exact test, there was no statistically significant difference between the infections seen in Groups A02 and A03 (p=1.000) and Groups B02 and B03 (p=0.109) respectively. **Conclusion:** No significant benefit could be demonstrated by administering perioperative oral antibiotics to prevent post-operative infection in third molar surgery.

Keywords: third molar surgery, perioperative antibiotics, prophylaxis, post-operative infection

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BASEMENT MEMBRANE PROFILE OF KERATOCYSTIC ODONTOGENIC TUMOUR

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Introduction: Keratocystic Odontogenic Tumour (KCOT) is formerly known as odontogenic keratocyst (OKC). The high recurrence rate is a unique characteristic of KCOT. **Objective:** The present study was aimed at determining the presence of Collagen IV, Laminin 5, Matrix Metalloproteinase- 2 (MMP-2) and Matrix Metalloproteinase- 9 (MMP-9) in the basement membrane (BM) zone of KCOT in order to gain a better understanding of the role they might play in the high recurrence rate in KCOTs. **Methodology:** Haematoxylin and eosin-stained sections of 26 KCOT cases were grouped into I). Twelve primary KCOT cases which had not recurred (KCOTnR) (n=12), II). Seven primary KCOT cases which had recurred (KCOTwR) (n=7) and III). Seven recurrence KCOT (ReKCOT) (n=7). These were prepared for immunohistochemical staining for Collagen IV, Laminin 5, MMP-2 and MMP-9 with suitable positive and negative controls. **Results:** Primary KCOTnR showed Collagen IV expression in high percentage (75.0% cases) followed by those found in KCOTwR (28.6% cases). The expressions of Collagen IV, Laminin 5, MMP-2 and MMP-9 at the BM zone were not significantly different between the primary KCOTnR and primary KCOTwR but a decrease in the number of immunopositive cases of the Collagen IV in the primary KCOTnR to the primary KCOTwR and the ReKCOT was seen. Immunopositivity for Laminin 5, MMP-2 and MMP-9 were also found in the basal and suprabasal epithelial cells. MMP-2 and MMP-9 immunoreactivity were also detected in the fibroblasts of the connective tissue stroma. **Conclusion:** There was no statistically significant difference in the expressions of Collagen IV, Laminin 5, MMP2 and MMP9 at the BM zone between the primary KCOTnR and primary KCOTwR. Collagen IV, Laminin 5, MMP-2 and MMP-9 may be involved in the modulation of KCOTs' basement membrane integrity but may not be used as a predictable marker for the recurrence of KCOT.

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EXPRESSION OF CYCLIN D1 AND p27 IN ORAL SQUAMOUS CELL CARCINOMA

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Introduction: Cyclin D1 regulates cell cycle progression by forming a complex with different cyclin-dependant kinases. p27 is an inhibitor of cyclin dependant kinase and acts as negative regulators of the cell cycle. Deregulation of cyclin D1 and p27 can result in loss of normal cell growth and tumour development. Increased expression of cyclin D1 and underexpression of p27 have also been correlated with poor prognosis in a variety of human tumours. **Objective:** The aim of the present study was to describe the expression of cyclin D1 and p27 in oral squamous cell carcinoma (OSCC) of buccal and alveolar mucosa and also to investigate whether there is any association between the expressions of cyclin D1 and p27 with selected clinicopathological parameters (habit, Broders' tumour grading, tumour size, tumour depth, pattern of invasion, lymph node metastasis and pTNM staging). **Methodology:** The samples of the study were taken from surgical specimens of 31 patients who had been diagnosed with OSCC of buccal and alveolar mucosa. The surgical specimens were obtained from the archives of the Oral Pathology Diagnostic Laboratory. The sociodemographic and clinical data were obtained from the Malaysian Oral Cancer Tumour and Database System at the Oral Cancer Research and Coordinating Centre (OCRCC). Of the 31 patients, 25 (81%) were females and 6 (19%) were males. Overall age ranged from 41 to 86 years with a mean age of 62 ± 9.93 years. The OSCC patients consisted of 24 (78%) Indians, 6 (19%) Malays and 1(3%) Chinese. The expressions of cyclin D1 and p27 were demonstrated with immunohistochemistry using the Envision system. Immunoreactivity evaluation of cyclin D1 and p27 was performed using the image analyzer. For analysis of cyclin D1 and p27 expressions, positive staining was considered when there is more than 5% and 10% of nuclear reactivity in the selected cell population observed respectively. Statistical correlations between cyclin D1 or p27 expression and certain clinicopathological parameters of OSCC were analyzed using chi square or Fisher's exact test. **Results:** Cyclin D1 positivity and reduced expression of p27 was detected in 74% and 87% of the cases respectively. The distribution of cyclin D1 immunoreactivity was observed mainly at the periphery of the tumour islands at the invasive front with decreasing immunoreactivity towards the centre. No immunoreactivity was seen within the keratin pearls. The distribution of p27 expression appeared to be opposite to the cyclin D1 expression where absent and low immunoreactivity was observed mainly at the periphery of the tumour islands at the invasive front. The present study found significant correlation between cyclin D1 positivity with larger tumour greatest dimension (T3 and T4) ($p = 0.012$), tumour depth > 8 mm ($p = 0.043$), non cohesive pattern of invasion ($p = 0.001$) and advanced pathological tumour stage (III-IV) ($p = 0.003$). Reduced p27 expression was significantly associated with non cohesive pattern of invasion ($p = 0.043$). **Conclusion:** The present findings showed overexpression of cyclin D1 and underexpression of p27 in OSCC of the buccal and alveolar mucosa. These findings support other findings that cyclin D1 and p27 are involved in oral carcinogenesis. There is a significant correlation between overexpression of cyclin D1 and underexpression of p27 with some clinicopathological parameters which are known independent prognostic indicators. Thus, these results suggest that overexpression of cyclin D1 and underexpression of p27 may be used as prognostic markers for OSCC of buccal and alveolar mucosa.

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THE INTERCANTHAL AND INTERPUPILLARY DISTANCES OF THREE MAJOR ETHNIC GROUPS IN MALAYSIA

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The normal range of intercanthal distance (ICD) and interpupillary distance (IPD) have only been reported in one minor ethnic group in Malaysia, the KadazanDusun. The aim of this study was to establish the ICD and IPD in the three major ethnic stocks in Malaysia, namely the Malays, Chinese and Indian. A total of 300 samples consisting of 50 adult males and 50 adult females of each ethnic stock were recruited from the campus of the University of Malaya. ICD was measured between the midpoints of the pupils. Measurements were done twice to the nearest 0.5mm by one researcher using a calliper and a metal ruler. A mean was taken out of these two measurements. If there were major discrepancies, a third reading was taken and the two closest-measurements were accepted. In ICD measurement, the means of all three groups were highly significantly different from each other. The widest space between inner canthus was recorded in both sexes of the Indians. Gender variation is statistically significant where the males tend to have a wider intercanthal distance compared to females in all three ethnic groups. There was no significant difference between the mean IPD values among the three ethnic groups. However highly statistically significant difference (independent t-test <0.001) was seen when comparing the two sexes; the male generally had a wider IPD to the female in all the races. The ICD and IPD in this study were within the range of those in the KadazanDusun, whites, black and mixed populations.

Keywords: intercanthal distance, inter-pupillary distance, anthropometry, ethnic

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BISPHOSPHONATES AND OSTEONECROSIS OF THE JAW: A HIGHLIGHT

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Reports of Bisphosphonate-induced Osteonecrosis of Jaw (BONJ) are increasing lately and its development is associated with oral health. Exact pathogenesis of BONJ remains ill-defined. Complex interplay of multiple risk factors, especially dental surgery, altered bone metabolism secondary to Bisphosphonate (BP) therapy and duration of exposure of an individual to BP are associated with the pathological presentation. Clinical signs and symptoms may vary for each patient. Adherence to recommended dental treatment may reduce risk of development of BONJ. Aim of treatment of BONJ currently is to control the pathology and discontinuation of BP therapy at the onset of BONJ is debatable.

Project reported to the Oral Health Division, Ministry of Health Malaysia

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CRANIOFACIAL ANTHROPOMETRY: A COMPARISON BETWEEN MALAY AND *ORANG ASLI KUALA*

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Introduction: Direct craniofacial anthropometry is a simple and non-invasive method that is useful to gather information on the facial profile of various ethnic groups for the purpose of physical anthropology study, ergonomic study and the planning of craniofacial reconstructive surgery. **Objective:** The aim of this cross-sectional study was to determine the differences in craniofacial morphology between the Malay and *Orang Asli Kuala* in Peninsular Malaysia. **Methodology:** A series of 21 direct anthropometric craniofacial measurements were performed on 120 healthy subjects of both ethnic groups. There were 30 females and 30 males between 18 to 45 years of age who were recruited into each group. Subjects of mixed parentage were excluded. Standard anthropometry method as outlined by Farkas (1994) was used. Seventeen proportion indices were derived from the measurements obtained. The data were compared using independent t-test with the significant value set at 95% ($p<0.05$). **Results:** Comparisons between both groups showed several similarities and differences in their craniofacial features. Almost all the significant differences were found in the vertical measurements (v-n, v-gn, n-gn, n-sto, sto-gn, ps-pi, n-sn) while the horizontal measurements (eu-eu, g-op, zy-zy, go-go, en-en, en-ex, ch-ch) remained almost equal. Our findings showed that both ethnic groups shared the same *mesocephalic* head (medium wide-long type), long *leptoprosop* face (long-narrow face type), similar intercanthal distance and eye fissure length, similar nasal tip protrusion height and almost identical orolabial dimensions. However, because of the differences in vertical dimensions, some distinguished features were obvious in 4 regions, namely the head, face, orbit and nose. The *Orang Asli Kuala* had longer head, shorter midface but longer mandible height and smaller eye fissure height. They also presented with a *chamerrhin* nose type (broad; wide alar and short nose) while the Malay presented with a *mesorrhine* (medium width) nose type. This typical Negroid nose type is the most striking distinguishing feature for the *Orang Asli Kuala*. **Conclusion:** This study suggests that the *Orang Asli Kuala* manifests facial features that are a mixture of the African (Negroid) and the Malay and Chinese, both of whom are of Mongoloid stock. However, the finding of this small scale study needs to be confirmed by a larger scale, randomised and preferably stratified study. A multi-researcher calibrated re-collection of data with standard instruments and methodology or even by using more sophisticated technology of measurement may be helpful to ensure more accurate and reliable outcomes in the future.

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RESEARCH
IN
PAEDIATRIC DENTISTRY

A RETROSPECTIVE ANALYSIS OF TRAUMA CASES SEEN IN THE PAEDIATRIC DENTAL SPECIALIST CLINIC, SULTANAH AMINAH HOSPITAL

Mohd Ridzuan MR, Sockalingam G

Introduction: The Paediatric Dental Specialist Clinic, Sultanah Aminah Hospital, Johor Bahru, Johor is a tertiary referral centre for paediatric dental / maxillofacial cases in the southern region of Peninsular Malaysia. The clinic receives referrals for the management of a wide spectrum of conditions including maxillofacial trauma and dental injury. **Objective:** The aim of this study is to report the occurrence, aetiology, demographic and clinical features, treatment modalities, pattern and time of referral of trauma cases seen in our setting. **Methodology:** A retrospective review was conducted on 67 dental records (yellow cards) of children referred to the clinic for management of maxillofacial and dental trauma throughout 2008. **Results:** Out of 1,030 new cases seen over the study period, 6.5% patients presented with maxillofacial and/or dental trauma. The mean age was 5.9 ± 3.4 years. Female to male ratio was 1:2.35. Malays comprised the majority (82.1%) followed by Chinese (13.4%) and Indians (4.5%). Fall was the most common aetiology. Fifty three cases presented with soft tissue injuries. Fifty seven percent of the subjects sustained dental injury while only 11.9% of cases suffered basal bone fracture. Local anaesthesia with sedation was the preferred mode of anaesthesia. The majority of the cases were referred from Accidents & Emergency Department and slightly more than half were seen during office hours. **Conclusion:** Soft tissue injury is the most common presentation in trauma cases in paediatric dental patients.

Keywords: paediatric, trauma, clinical pattern

Paper presented at Quality Initiatives & 1st Johor Oral Health Research Conference, 10-11 June 2009 at Sultan Ismail Hospital, Johor Bahru

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A RETROSPECTIVE STUDY OF THE INCIDENCE OF MISSED APPOINTMENTS WITH THE DENTAL NURSE AT THE PAEDIATRIC DENTAL SPECIALIST CLINIC, SULTANAH AMINAH HOSPITAL JOHOR BAHRU

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Introduction: The Paediatric Dental Specialist Clinic, Sultanah Aminah Hospital is one of the two referral centres for paediatric dental and maxillofacial cases for the state of Johor. Consultation and treatment are given by appointment except for emergency cases. One time slot is usually booked for each patient. When patients do not turn up for the appointment then the slot is not utilised. Missed appointments present a significant problem in the effective and efficient running of the clinic. **Objective:** The aim of this study is to determine the percentage of failed appointments with the dental nurse over a period of 1 year from January 2008 – December 2008. **Methodology:** A retrospective review was conducted on the dental nurse's appointment book for the year 2008. Attendances were assigned to three groups: attended appointment, missed appointment with notice and missed appointment without notice. **Results:** Out of a total of 795 cases seen in year 2008, 24.5% failed to attend their appointments. Malays comprised the majority (65.2%) followed by Indians (14.4%) and Chinese (18.9%). Female to male ratio was 1:1.2. Primary schoolchildren were the largest group of patients who failed to attend appointments. It was also noted that the highest period for failed appointments occurred from July to September. **Conclusion:** Missed appointments can cause a disruption of clinical time management and also delay treatment for the patients.

Poster presentation at Quality Initiatives & 1st Johor Oral Health Research Conference, 10-11 June 2009 at Sultan Ismail Hospital, Johor Bahru

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DELAYED ERUPTION OF UPPER PERMANENT INCISOR: A CASE REPORT

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Failure of eruption of incisors can cause problems in the adult dentition. There are many factors leading to delayed or failed eruption. Local factors like trauma, ectopic crypt position, cystic change in the follicle, thickened mucosa, presence of supernumerary and odontomes may prevent eruption of a permanent incisor. Systemic factors may include Cleidocranial dysplasia, Gardner syndrome or some endocrine disorder. Early diagnosis is vital and a number of options are available for treatment. This clinical case report describe the management of a 13-year-old Chinese schoolgirl presenting with delayed eruption of her upper right incisor tooth. Surgical removal of the obstruction that has delayed the eruption led to the spontaneous eruption of the upper right incisor into the oral cavity. Timing and the sequence of permanent teeth eruption will influence the integration of the dentition. Early diagnosis is essential as it increases the chances of a successful outcome and the chances of the unerupted incisor erupting without the necessity for appliance therapy.

Poster presentation at Quality Initiatives & 1st Johor Oral Health Research Conference, 10-11 June 2009 at Sultan Ismail Hospital, Johor Bahru

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A RETROSPECTIVE CLINICO-STATISTICAL ANALYSIS OF LIP MUCOCELE OCCURRENCE IN CHILDREN BELOW 16 YEARS SEEN AT THE PAEDIATRIC DENTAL SPECIALIST CLINIC, SULTANAH AMINAH HOSPITAL, JOHOR BAHRU

Sockalingam G

Objective: The objective of this study is to report the occurrence and clinical findings of lip mucoceles in children. **Methodology:** The period of study was 3 years beginning 2003 to 2005. Treatment cards (L.P 8-2 Pin.7/97 and L.P 8-Pin. 6/89) of all patients seen at the clinic in the years 2003, 2004 and 2005 were retrieved. All cards of patients in whom a clinical diagnosis of lip mucocele was made were then selected. Required data was recorded and subsequently analysed. **Results:** Out of 1,407 new cases seen over the period of study, 17 (1.2%) patients presented with lip mucoceles. All lesions occurred in the lower lip. There was no sex or racial predilection. The average duration of the lesion prior to seeking treatment was 2.8 ± 2.8 months. Most patients (76.5%) first saw a medical practitioner for the problem. No spontaneous resolution of the lesions in any of the patients was noted. The preferred method of treatment of lower lip mucoceles in children is surgical excision of the involved minor salivary glands. **Conclusion:** Salivary gland mucoceles in children predominantly involve the lower lip and can be treated successfully by complete removal of the involved and associated minor salivary glands.

Poster presentation at Quality Initiatives & 1st Johor Oral Health Research Conference, 10-11 June 2009 at Sultan Ismail Hospital, Johor Bahru

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FACIAL CELLULITIS OF ODONTOGENIC ORIGIN IN CHILDREN

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Objective: The purpose of this study was to investigate the clinical history and characteristics of facial cellulitis of odontogenic origin in children referred to the Paediatric Dental Specialist Clinic, Raja Perempuan Zainab II Hospital, Kota Bharu. **Methodology:** All patients who were diagnosed with this condition from January 2008 until August 2009 were included in this study. The personal data, clinical history and characteristics of the condition were recorded from the case notes, location, symptoms of cellulitis, the length of hospitalisation, mode of treatment, history of visit to the dentist, caries experience and management of the patient were noted. Descriptive analysis was used to analyse the data using Windows SPSS version 13.0. **Results:** Thirty nine samples were collected; 22 or 56.4% were males and 17 or 43.6% were females. The mean age was 6.69±3.50. It was found that 94.5% had toothache prior to swelling and 51.3% had fever. A total of 74.1% had more than 6 teeth carious while 61.5% required hospitalisation and the mean length of stay in hospital was 2.94 ± 3.43 days. A majority of 71.4% were treated under local anaesthesia while 28.6% were treated under general anaesthesia. **Conclusion:** Facial cellulitis is very debilitating to patients. The low level of dental care was evident where many patients were highly affected by dental diseases and most were never brought to see the dentist before developing the cellulitis. The implication of facial cellulitis on healthcare cost can be appreciated by the amount of care needed once the children develop the disease. Some required admission into hospital and the use of general anaesthesia. Since dental caries is a preventable disease, it is important that prevention of caries at the community level, particularly in Kelantan, is revised and strengthened. Facial cellulitis of odontogenic origin imply an unnecessary increase in healthcare service burden in terms of personnel, time and cost.

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CLINICAL REVIEW ON FACIAL SOFT TISSUE INJURY AMONG CHILDREN ATTENDING PAEDIATRIC DENTAL SPECIALIST CLINIC IN SULTANAH NUR ZAHIRAH HOSPITAL, TERENGGANU

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Objectives: 1) To determine the age of patients frequently involved with facial soft tissue injury 2) To investigate the location of facial soft tissue injury 3) To assess the time of management of soft tissue injury 4) To evaluate the outcome of treatment of soft tissue injury. **Methodology:** Data was collected retrospectively from patient folders in the Paediatric Dental Specialist Clinic, Sultanah Nur Zahirah Hospital, Kuala Terengganu. The samples are patients who sustained soft tissue injury from the period of January 2006 until June 2008. There were 267 patients involved. These data were processed using SPSS version 13.0. **Results:** Children from the age of 3 to 16 are frequently involved with soft tissue injuries (30% in 7-12 age group, 29% in 13-16 age group and 25% in 3-6 age group). The most common location for facial soft tissue injury was at the lower third of the face (59%) followed by multiple locations (29%). A total of 92% of the patients had immediate treatment while others were treated more than 1 day later. Most of the management carried out was toileting and suturing under local anesthesia (70%) followed by observation only (30%). A majority of 76% of the patients were given both analgesics and antibiotics for medication. On review, more than 90% patients had no pain, no infection and normal mouth opening. **Conclusion:** Children aged between 7-12 years old are more prone to soft tissue injuries than other age groups. Most injuries occurred in the lower third of the face. Commonly, immediate toileting and suturing, analgesics and antibiotic were given as the management. The overall outcome of soft tissue injury management was good.

Project reported to the Oral Health Division, Ministry of Health Malaysia

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RESEARCH
IN
ORTHODONTICS

THE FREQUENCY OF SKELETAL PROBLEMS AMONG ORTHODONTIC PATIENTS AT THE MUAR ORTHODONTIC SPECIALIST CLINIC, JOHOR

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Introduction: The relationship of skeletal facial pattern has been a criterion during the clinical examination for orthodontic patients. This skeletal evaluation is useful for the orthodontist to prioritise and plan treatment for the patient. **Objective:** The purpose of this study was to assess the frequency of skeletal problems among orthodontic patients and to identify the frequency of the problems according to their age, ethnicity, gender and type of treatment they have received. **Methodology:** The study was done at the Muar Orthodontic Specialist Clinic, Johor. A retrospective study was conducted on a sample of 335 patients. A random sampling was employed involving collection of data from the year 2000 to 2007. All the information collected from the LP7 treatment card was filled in the data collection form. Data were analysed descriptively. **Results:** The frequency of Class II and Class III skeletal problems among orthodontic patients was high (62%) with 46% of them have Class II and the remaining (16%) with Class III skeletal problem. The most commonly affected age group with skeletal problem was between 13-17 years-old (69%). The highest frequency of skeletal problem was among the Chinese (45%) while the Malay had the second highest of Class II skeletal problem (34%). The frequency of Class II and Class III skeletal problems was higher among the females (70%) compared to the males (30%). Most of the patients with skeletal problems (94%) were treated with fixed appliances. **Conclusion:** The most frequent Class II and III skeletal problems were among the Chinese, age group 13-17 years and females. Most of them were treated with fixed appliances.

Keywords: skeletal II, skeletal III, frequency of problem

Project reported to the Oral Health Division, Ministry of Health Malaysia

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THE FREQUENCY OF SKELETAL PROBLEMS AMONG REFERRAL PATIENTS TO THE ORTHODONTIC SPECIALIST CLINIC

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Introduction: Skeletal problem is evaluated through 3 dimensions which are the anteroposterior, transverse and vertical dimensions. In the anteroposterior dimension, skeletal classification is categorised into Class I, Class II and Class III skeletal whereby Class II and Class III are the skeletal problems. In the transverse dimension, skeletal problem always involve the narrow maxilla problem. The vertical dimension can cause anterior open bite and anterior deep bite. **Objective:** This study was done to assess the frequency of skeletal problems among patients who were referred to the Orthodontic Specialist Clinic, Abdul Samad Road, Johor Bahru. **Methodology:** Data collection was based on referral case records in 2004. The sample size was 275 consisting of males and females, also including the 3 major ethnic groups which are Malay, Chinese and Indian. **Results:** This study has shown that the Class I, Class II and Class III skeletal problems were 53%, 37% and 12% respectively. The results for malocclusion were Class II Division I (65%), Class I (22%), Class III (12%) and Class II Division II (1%). From the study, 37% and 10% of the samples had Class II and Class III skeletal problem respectively and among those patients, 14.5% had been given early treatment. **Conclusion:** It was found that the frequency of Class II skeletal problem was high among the 275 patients who had been referred to the Orthodontic Unit, Abdul Samad Road Dental Clinic.

Project reported to the Oral Health Division, Ministry of Health Malaysia

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A STUDY ON THE PREVALENCE OF MALOCCLUSION AMONG CLEFT LIP AND PALATE PATIENTS AT THE ORTHODONTIC SPECIALIST CLINIC IN JOHOR

Fariza T

Cleft is a congenital disorder which occurs during craniofacial growth. Cleft lip and palate (CLP) patients may have other problems which include abnormality in the number of teeth, malformed teeth, malocclusion, and abnormality in the alignment of maxilla and occlusion relationship. Members of the cleft lip and palate treatment team usually include specialists from various disciplines. For orthodontic treatment, the issues are more related to the aesthetic and function of teeth. This retrospective study was done at Orthodontic Specialist Clinic, Johor. The objective is to assess the prevalence of malocclusion among cleft patients and the number of cleft patients according to gender and ethnic group; type of cleft and the treatment given. The subjects were patients who were referred from the year 2000 to 2007. Data was collected for a total of 63 subjects from Johor Bahru, Kluang and Batu Pahat Orthodontic Specialist Clinics. From the study, 56 (89%) had Class III malocclusion, 2 (3%) had Class II malocclusion and 5 (8%) had Class 1 malocclusion. Cleft patients were higher among the Malays (46%) followed by Chinese (43%) and Indian (11%). Unilateral cleft at the left side was the highest (44.4%) followed by right unilateral cleft (22.2%). Twenty one patients (33.3%) had both cleft lip and palate (BCLP). Orthodontic treatment in mixed and permanent dentition for the cleft patients included wearing of quadhelix or upper/lower removable appliance (URA) for arcus development, fixed appliance or combination of both. Alveolar implant treatment was done by the Plastic Surgeon or Oral Surgeon.

Keywords: prevalence, Class II malocclusion, Class III malocclusion

Project reported to the Oral Health Division, Ministry of Health Malaysia

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PROBLEMS ENCOUNTERED BY PATIENTS WEARING THE REMOVABLE APPLIANCE

Muniandy PL

Introduction: Orthodontic treatment can be done by moving the teeth with removable or fixed appliances. Active appliances work by simple tipping movements whereby the retainer is a passive appliance which is used as retention after treatment with fixed appliance. **Objective:** To identify problems encountered by orthodontic patients in the wearing of removable appliances at the Orthodontic Clinic, Abdul Samad Road, Johor Bahru. **Methodology:** This is a cross-sectional study involving 80 patients using removable appliances. **Results:** It was found that 25 patients were wearing upper/lower removable appliances (URA), 29 patients had passive retainers and 26 patients were using functional appliances (Twin Block/ Bionator). Speech problems were encountered by 32% of the patients, 29% felt discomfort, followed by broken appliances (22%), not suitable (13%) and loss of the appliance (4%). **Conclusion:** Speech problems were the most frequent problems encountered by patients wearing the removable appliance.

Project reported to the Oral Health Division, Ministry of Health Malaysia

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CRANIOFACIAL MORPHOLOGY OF CLASS II DIVISION 1 MALOCCLUSION IN MALAY ETHNIC GROUP IN MALAYSIA

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Objective: To evaluate craniofacial features of Class II division 1 malocclusion of Malay ethnic group in Malaysia. **Methodology:** This study involved fifty one (26 males and 25 females) pretreatment lateral cephalometric radiographs of Malay patients with Class II division 1 malocclusion selected from the files of Orthodontic Clinic, Dental Faculty of *Universiti Kebangsaan Malaysia* and from the Government Orthodontic Clinic, Bangsar, Kuala Lumpur. The craniofacial features of the Class II samples were compared with Class I controls of approximately similar age and number. Independent sample t-test was used to evaluate the differences between sex and between Class II division 1 and Classs I malocclusion. **Results:** Wide variations were observed for most of the measurements. Class II subjects have longer maxilla, more convex facial profile, retrognathic mandible and shorter mandibular body compared to Class I subjects. Sex differences related only to size where males generally have larger or longer skeletal features compared to females. **Conclusion:** The findings have important clinical implications regarding treatment decisions for Malay patients with Class II division 1 malocclusion. In addition, this study provides a foundation for further studies pertaining to Class II division 1 malocclusion in the Malay ethnic group in Malaysia.

Keywords: Class II division 1, Class 1 malocclusion, craniofacial feature

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NORMATIVE AND PERCEIVED NEED FOR ORTHODONTIC TREATMENT AMONG SCHOOLCHILDREN

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Introduction: The decision for orthodontic care is most often determined by normative need. However, a person's decision to seek orthodontic treatment is often based on multiple factors. **Objective:** To compare the orthodontic treatment need amongst 13 - 14 year-old schoolchildren using the Dental Health Component (DHC) and Aesthetic Component (AC) of the Index of Orthodontic Treatment Need (IOTN) with the children's perceived need for orthodontic treatment. **Methodology:** A cross-sectional study was conducted on 700 schoolchildren attending 8 secondary schools in Jempol District. A multi-stage and stratified random sampling was employed. Children's normative need was assessed using the DHC and AC of the IOTN by a trained researcher while their perceived needs were matched by using the photographs on the AC scale. **Results:** The normative need according to the DHC was 27.1% as indicated by the need treatment category while the AC indicated 21.9%. About 97% of the schoolchildren agreed with the dentist that they did not require treatment. In contrast, only 12.4% agreed with the dentist that they need treatment based on their AC scores. No significant difference was found between gender or ethnicity with the children's perceived need ($p>0.05$). Based on both DHC and AC by dentist, the Chinese had the highest need for treatment followed by the Malays and Indians ($p > 0.05$). **Conclusion:** Perceived need among schoolchildren in certain population is low compared to the normative need. Therefore, evaluation of perceived need is useful in any treatment priority assessment in decision making for orthodontic services.

Keywords: IOTN, normative need, perceived need

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CEPHALOMETRIC ANALYSIS OF UNILATERAL CLEFT LIP AND PALATE PATIENTS

Ebin L @ E

The aim of this cross-sectional study was to establish a descriptive summary of the craniofacial morphology for the Malay unilateral cleft lip and palate (UCLP) patients and also to document the possible craniofacial morphology differences between the Malay UCLP children and 'normal' Malay children with no UCLP (control). In addition, Malay UCLP was also compared to the Caucasian UCLP for possible differences in their craniofacial morphology. Twenty UCLP children (12 boys, 8 girls) with a mean age of 10.5 years (SD ± 1.79) were compared with 20 control children (12 girls, 8 boys) who were matched for age (mean = 9.72 years, SD ± 1.70) and sex. The Malay UCLP was also compared with the Caucasian UCLP of matched age from the study of Semb G. (1991). Thirty one linear and angular variables were measured from lateral cephalometric radiographs where the landmarks were directly digitised with Dolphin Imaging Software Version 10.0 (Dolphin Imaging, Chatsworth, CA). The data were analysed with Mann-Whitney test and the level of significance was set at $p < 0.05$. Compared with the control group, the Malay UCLP demonstrated a more retrognathic and shorter maxilla but with normal mandible. The cranial base angulation was smaller and more acute in Malay UCLP. There was also a bimaxillary retroclination of the upper and lower incisors which led to increased angulation of the interincisal angle. The soft tissue was less convex with obtuse nasolabial angle and thinner upper lip. There were no significant findings in the vertical measurement of facial height and maxillomandibular plane angle. The Malay UCLP showed a tendency for Class III skeletal pattern compared to Caucasian UCLP due to a smaller and acute cranial base angulation and more forward position of the mandible. In conclusion, the most significant difference was found in the maxilla morphology, where the maxilla of the Malay UCLP was more retrusive and shorter than the control group but was set more forward when compared to the Caucasian UCLP.

This research report is submitted in partial fulfillment of the requirements for the degree of Master of Orthodontics

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EFFECT OF LIGHT TIP ANGULATION ON THE SHEAR BOND STRENGTH OF AN ORTHODONTIC ADHESIVE

Ummu Aiman Y

A number of studies have been done in relation to the effects of different factors affecting the shear bond strength of orthodontic adhesives. At present there are no studies that have evaluated the effect of light tip angulation while curing orthodontic adhesives on the shear bond strength. The purpose of this study was to investigate the effect of light curing tip angulation on the shear bond strength of an orthodontic adhesive. Ninety human premolars with brackets bonded in a standardised manner using the light-cure orthodontic adhesive, Transbond XT, were polymerised using a blue LED light curing unit for 40 seconds at three different angulations of 0 degree, 45 degrees and 90 degrees at a standardised 3 mm distance. The Instron Universal Testing Machine was used to measure the maximum force for debonding. The Adhesive Remnant Index (ARI) and evaluation under Scanning Electron Microscope (SEM) were done to evaluate the site of bond failure on tooth and bracket surface, respectively. SPSS version 12.0 was used to analyse the data. The Kruskal-Wallis test was employed to compare the shear bond strength of all groups. From the results, the mean shear bond strength values for Group A (0 degree), Group B (45 degrees) and Group C (90 degrees) were 4.15, 4.56 and 6.66 MPa, respectively. The highest mean rank was 46.98 for group C. The statistical analysis of the study showed no significant difference ($p = 0.286$) of the shear bond strength of orthodontic adhesives when cured at three different angulations of the light curing tip. However, the highest shear bond strength was at 90 degrees angulations of the light curing tip and its value was within the optimal orthodontic force.

Research report submitted as partial fulfillment of the requirement for the Degree of Master of Orthodontics

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AN INTERCEPTIVE ORTHODONTIC PACKAGE FOR DENTAL OFFICERS – EVALUATING THE INITIATION OF ITS IMPLEMENTATION

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Introduction: The increasing demand for orthodontic treatment has highlighted the chronic waiting list situation in the public service under the Ministry of Health Malaysia, which can be as long as 3-4 years. This poses problems as some interceptive orthodontic cases that could be treated with simple removable appliances during adolescence can be missed out. Involvement of dental officers in the management of selected interceptive cases is appropriate as they had undergone basic orthodontic training under their undergraduate curriculum and can improve orthodontic service delivery. **Objectives:** The aims of the study were to determine the effectiveness of the intervention package to enable dental officers to manage interceptive orthodontic cases under supervision and to identify problems faced by them during its implementation. **Methodology:** A non-randomised interventional study involving 15 dental officers (intervention group) and 6 orthodontists (control group) was carried out in 4 states. The study started with central level training for dental officers and 16 dental technologists who were attached to the control group using pre-designed training modules. Altogether 403 patients were involved in the study. For comparison of treatment outcome, 237 prospective samples were taken for the dental officers and 166 retrospective samples for the orthodontists. Clinical management of cases was carried out in 2 phases, first 6 months of handholding followed by a period of independent management with regular monitoring by the orthodontists (control). A set of validated and pre-tested questionnaires was also used to identify problems faced by dental officers during the conduct of the study. Data collected were analysed statistically using SPSS Version 15. Outcomes achieved by both groups were compared. Pooled analysis by meta analysis using Random Effect Model Analysis to analyse success rate was carried out using STATA/SE version 10. **Results:** This study showed no statistical difference in successful treatment outcome, reduction in Index Of Orthodontic Treatment Need (IOTN) grade and patient's compliance between the two groups. Few problems were encountered by dental officers during the study and the majority of them agreed that interceptive orthodontics has a role in improving service delivery and job satisfaction. **Conclusion:** Dental officers should be able to manage selected interceptive cases successfully with training and guidance. It is therefore recommended that the role of dental officers be expanded to include management of interceptive orthodontic cases following a course of training with this proposed intervention package.

Project reported to the Oral Health Division, Ministry of Health Malaysia

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EVALUATION OF ORTHODONTIC TREATMENT OUTCOME: A SELF-AUDIT USING THE PEER ASSESSMENT RATING (PAR) INDEX

Loke ST

Introduction: The peer assessment rating (PAR) index was used to self-audit 4 years of completed preadjusted edgewise appliance cases treated by a single orthodontist in a government clinic. **Objectives:** The objectives of this study were to evaluate orthodontic treatment standards and factors which may influence treatment outcomes and treatment time. **Methodology:** Pre and post-treatment study models were scored using the PAR index by the author. Seventeen models were re-examined for intra-examiner reliability using intraclass correlation coefficient (ICC). ICC was excellent for pre-treatment (0.96), post-treatment (0.98) and reduction in PAR (0.96) scores. **Results:** There were 173 cases (51 males; 122 females) with mean age 17.6 (SD 5.75) years. Mean treatment time was 18.6 (SD 6.47) months with range between 5-40 months. There was no statistically significant difference between one-arch and two-arch cases and between routine and compromised cases. Treatment time in extraction cases (mean 19.5, SD 6.17) was significantly different (p=0.000) compared with non-extraction cases (mean 11.6, SD 4.10) although this accounted for 15% of the variation only (r=0.388). A total of 76.3% cases were 'greatly improved', 22.0% 'improved' and 1.7% 'worse/no different'. Mean pre-treatment, post-treatment and reduction in PAR score was 34.1 (SD 9.68), 6.4 (SD 6.84) and 27.9 (SD 9.69) respectively. Mean percentage PAR score reduction was 82.0% (SD 1.96). Pre-treatment (p=0.000), post-treatment (p=0.000) and reduction (p=0.489) in PAR scores was significantly different between routine and compromised cases. There was significant difference (p=0.000) between category of improvement and pre-treatment scores but not with treatment time. **Conclusion:** A high standard of treatment outcome was achieved. Severe malocclusions had larger reduction in PAR scores and required longer treatment time. Extraction cases took longer to complete and routine cases had better outcomes than compromised cases with severe skeletal discrepancy.

Keywords: PAR index, preadjusted edgewise appliance, self-audit

Project reported to the Oral Health Division, Ministry of Health Malaysia

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PERCEPTIONS AND IMPLEMENTATION OF ORTHODONTIC CLINICAL PRACTICE GUIDELINES (CPG) BY DENTAL OFFICERS AND ORTHODONTISTS IN MALAYSIA

Loke ST, Ang LC

This survey elucidated the perceptions and implementation of orthodontic Clinical Practice Guidelines (CPGs) by all orthodontists and dental officers in the Ministry of Health Malaysia (MOH). Two different sets of self-administered questionnaires were targeted at first-year dental officers (FYDO), dental officers (DO) and administrative Senior Dental Officers (SDO) in one group and orthodontists in another group. Only 30% responded from a total of 1,327 MOH dental officers, with no participation from three states. The majority (89%) of officers have heard of CPGs although some were unsure of their purpose and usage. About 69% have read the orthodontic CPG of whom 87% have read other MOH dental CPGs. About 78.6% found CPGs 'good to excellent' but 16.0% did not answer this question. Some comments received included: language was confusing, inadequate details and pictures, need improvement, irrelevant, need CPGs for other orthodontic problems, need more knowledge first and request for more copies. Only 27.7% used them often, 53% occasionally and 15% hardly follow CPGs. About 82% felt that they were encouraged to use CPGs in their workplace and the majority (86%) knew where they were kept especially SDOs and DOs. About 90% in the orthodontist group have received hard copies of orthodontic CPGs but the majority (76%) have not seen them on the website. Although all felt that CPGs were useful to officers and encouraged their use, only 62.5% have introduced CPGs to their officers. There was generally more awareness and usage of CPGs among SDOs compared with DOs and FYDOs. The dissemination and availability of orthodontic CPGs is reasonably good. However, the implementation by orthodontists and administrative officers can be improved for better awareness, understanding and usage by dental officers, especially FYDOs.

Keywords: Clinical practice guidelines, orthodontics, perception

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RESEARCH
IN
PERIODONTOLOGY

PROFILE OF PATIENTS SEEN IN A JOINT DENTAL MULTI-DISCIPLINARY CLINIC

Chan YK, Zainatul Akmar K, Ma BC

Introduction: The joint dental multi-disciplinary clinic involves the specialities of orthodontics, oral surgery and periodontics. Two consultant orthodontists, one consultant oral surgeon and one consultant periodontist were attached to this clinic. **Objective:** The aim of the study was to analyse the profile of patients seen in a joint dental multi-disciplinary clinic in 2007 in the state of Johor, Malaysia. **Methodology:** A retrospective survey was conducted using national records from the joint clinic. **Results:** A total of 59 patients were seen in the clinic in 2007. The majority of the patients were ethnic Malay (50.8%) followed by Chinese (39.0%) and Indians (10.2%). There were slightly more female patients (57.6%) compared to male (42.4%). The majority of the patients required joint consultation and management by the speciality of orthodontic-oral surgery (74.6%), followed by orthodontic-periodontic (18.6%). The three most common treatment plans were orthognathic consultation and surgery (37.3%) followed by orthodontic treatment (18.6%) and dental implants (13.6%). Most of the referrals were from the speciality of orthodontics (88.1%) and periodontics (8.5%). **Conclusion:** The overall profile of patients showed that complex dental and dentofacial anomalies often require a multi-disciplinary approach in their management.

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THE HEALTH STATUS OF PATIENTS AT THE PERIODONTIC SPECIALIST CLINIC, JOHOR BAHRU

Runayati R @ M, Chan YK

Introduction: The patient's health problems can affect dental treatment. A recent study has demonstrated that about 42% of dental patients had at least one health problem. **Objective:** This study aimed to investigate the health problems of patients who came to the Periodontic Specialist Clinic in Johor Bahru. **Methodology:** This retrospective study was done at the Periodontic Specialist Clinic, Mahmoodiah Road, Johor Bharu. All new patients from January 2004 until October 2006 were involved in this study. Data on patient's health problem was collected from the medical history column of the periodontal treatment card (LP12). Socio demography data was collected and health problems were classified into 9 categories. **Results:** Three hundred and fifty six (356) patients were involved in this study. Among these patients, 26.1% of them have at least one health problem. Most of these patients had cardiovascular disease (56.5%), followed by endocrine problem (24.2%) and bleeding tendency (0.8%). The highest number of patients with health problem was from the oldest age group of more than 65 years. **Conclusion:** It will therefore be important to investigate the health problems of patient before providing any dental treatment to avoid any unnecessary incidents.

Project reported to the Oral Health Division, Ministry of Health Malaysia

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PERIODONTAL SCREENING AND PRACTICES AMONG GOVERNMENT DENTISTS IN MALAYSIA

Vaithilingam RD, Raman R, Siow YY, Wan Nur Azreena WH

Objective: This study aims to identify frequency of periodontal screening and knowledge of Basic Periodontal Examination (BPE) as well as management of periodontal diseases (PDs) among government dentists in the states of Negeri Sembilan dan Penang, Malaysia. **Methodology:** The study was carried out using a self-administered questionnaire which was posted to 120 government dentists in these states. A total of 117 questionnaires were returned. **Results:** A majority of 82.1% respondents were females as compared to 17.9% males. Questions asked were about frequency of periodontal screening, knowledge of BPE, management of periodontal abscesses and referrals to the periodontist. Findings showed 55.6% dentists screen for PDs routinely, 35.9% when they have the time and 8.5% never or very rarely screen. A total of 62.4% of the subjects were very familiar with BPE. Of these, 10.9% use it frequently while 67.12% use it when necessary. There was a significant association between knowledge of BPE and years since graduation ($p<0.05$). To manage periodontal abscesses, 83.8% would do deep scaling on affected teeth, 62.4% take radiographs and 88.9% prescribe antibiotics. Use of radiographs showed significant association with years of graduation ($p<0.05$). Within the past 6 months, 43.6% respondents made referrals to periodontists. Of these, 82.35% referred patients for treatment of chronic periodontitis, 43.14% for aggressive periodontitis and 50.98% for PDs secondary to systemic conditions. However, 56.92% respondents who did not refer were able to manage the PD. **Conclusion:** In this study, more than 50% of government dentists routinely screen for PDs. Younger graduates had better BPE knowledge and were more likely to take radiographs for periodontal abscesses as compared to their seniors. Antibiotics are widely prescribed by dentists to treat periodontal abscesses. The majority of referrals to periodontists were for chronic perodontitis.

Project reported to the Oral Health Division, Ministry of Health Malaysia

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RESEARCH
IN
RESTORATIVE DENTISTRY

ANTIMICROBIAL EVALUATION OF SODIUM HYPOCHLORITE AND OZONATED WATER ON E. FAECALIS BIOFILM

NurZiana I

Objective: To evaluate antimicrobial efficacy of sodium hypochlorite (NaOCI) and ozonated water as irrigants against Enterococci faecalis grown as biofilm. **Methodology:** Agar diffusion test were carried out to determine the baseline concentration of NaOCI and ozonated water in Part One of this study. Cellulose acetate membrane filters were used as biofilm model in second part of the study where minimum biofilm eradication concentration (MBEC) of NaOCI was determined. The bacterial biofilm was exposed to two concentration of NaOCI, 2.62% & 1.31% and 0.1ppm of ozonated water over a range of time periods (1, 2, 4, 8, 15, 30 and 60 minutes). The antimicrobial activity of the agents was ceased and the presence of viable cells was determined by inoculation onto BHI agar, incubation and enumeration of the colony forming units (CFU). Distilled water was used as a control agent. The antimicrobial activity was also tested by combining the 1.31% NaOCI and 0.1ppm ozonated water. All experiments were repeated four times (n=4). The rate of bacterial killing and effectiveness of the agents were compared using non-parametric Kruskal-Wallis test. **Results:** The results revealed that 2.62% of NaOCI can completely kill the E. faecalis biofilm in 15 minutes. However, 1.31% NaOCI required a longer time period to produce a similar effect (60 minutes). From the findings, 0.1ppm ozonated water seemed not to possess any antimicrobial effect within the period of time tested. However, combination of 1.31% NaOCI and 0.1ppm ozonated water show antimicrobial activity after 30 minutes of exposure time. When compared between the test agents, 2.62% NaOCI was significantly different ($p<0.05$) from the other agents in terms of its antimicrobial effectiveness. **Conclusion:** From this study, it can be concluded that 0.1ppm ozonated water was not comparable with 2.62% and 1.31% NaOCI in antimicrobial efficacy against E. faecalis biofilm. The 0.1ppm ozonated water is therefore not a suitable irrigant for root canal treatment and it is not recommended as such.

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ENDODONTIC TREATMENT OF A MAXILLARY CENTRAL INCISOR (11) WITH ARRESTED ROOT DEVELOPMENT: A CASE REPORT

Wan Azmil A, Rossuhaimi AR, Juanna B

Arrested root development of permanent teeth can occur due to local factors such as infection and trauma or general factors such as radiation and odontodysplasia. This case report presents tooth 11 with arrested root development requiring endodontic treatment. Following obturation with mineral trioxide aggregate (MTA), a minor surgical procedure was performed to remove periapical pathologic tissue. The tooth had remained asymptomatic at the 6-month review and the case will be followed-up for at least 2 years to ensure complete healing.

Keywords: arrested root development, endodontic treatment, mineral trioxide aggregate

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COMPLICATIONS OF INJECTION OF SODIUM HYPOCHLORITE BEYOND THE ROOT APEX

Ma BC, Chan YK

Irrigants are used to supplement mechanical preparation of root canals due to the complexity of the root canal system. Sodium hypochlorite remains one of the most commonly used irrigant solution in endodontics. Improper use of sodium hypochlorite during irrigation could result in severe complications from the injection of the solution beyond the root apex. This is a case report of complications in three patients. Treatment options and preventive measures to avoid such incidents are discussed.

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THE EFFECT OF DENTURE ADHESIVE ON FOOD OCCLUSION

Marlynda A, Dayang Fadzlina AI, Nurhafizah H, Natasya AT, Kamarul Hisham K

Objective: To compare the weight of retrieved food accumulated under denture bases with and without denture adhesive treatment. **Methodology:** The study was conducted in two parts which involved food occlusion and questionnaire. For the food occlusion study, accumulated peanuts under the denture base with and without denture adhesive were collected, dried, measured and compared using paired t-test. The two-section questionnaire for patient's feedback was administered after 7 days of using denture adhesive (review appointment). **Results:** The investigation found statistically significant ($t=2.945$, $df=31$, $p<0.05$) decreases in the mean weight of food impaction under denture bases when denture adhesive was applied; regardless of whether it was a maxillary or mandibular denture. The majority of the subjects reported increased confidence and comfort of denture use after using denture adhesive. **Conclusion:** Denture adhesive effectively reduces the amount of food particle impaction beneath dentures, thus increasing confidence and improving the quality of life of denture wearers.

Keywords: food occlusion, denture adhesive, quality of life

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MASTICATORY EFFICACY AND BITE FORCE IN COMPLETE DENTURES: A STUDY OF DENTURE ADHESIVE

Natasya AT, Muhd Termizi B, Muhd Dell Taufik M, Marlynda A, Kamarul Hisham K

Objective: The main objective of this study is to compare maximum bite force until denture dislodgement (BFDD) as well as masticatory efficacy (ME) of complete dentures, without and with denture adhesive, based on Modified Kapur Index Scale (MKIS). **Methodology:** Complete dentures that complied with MKIS were tested with BFDD and ME, using disposable gnathometer and consuming a quarter of apple to assess dislodgement of complete dentures respectively. Both tests were done without and with denture adhesive application. The ease and comfort level of mastication were assessed to compare between without and with denture adhesive. **Results:** BFDD improved in 17 (58.6%) samples with denture adhesive application (p=0.0001). Number of chewing cycles until first denture dislodgement for both maxillary and mandibular complete dentures increased with denture adhesive application. All samples agreed that ease and comfort level of mastication increased with denture adhesive. The magnitudes of correlation coefficient between MKIS to BFDD without and with denture adhesive were weak (r=0.081, r=0.057). **Conclusion:** Bite force and chewing cycle increased with denture adhesive application. Patients were satisfied with denture adhesive for mastication that made them more comfortable in chewing.

Keywords: bite force, masticatory efficacy, denture adhesive, Modified Kapur Index Scale

Paper presented at 16th FDI/MDA Scientific Convention & Trade Exhibition 2009, 17-18 January 2009 at Hotel Istana, Kuala Lumpur

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MANDIBULAR ALVEOLAR BONE RESORPTION IN SELECTED COMPLETE DENTURE PATIENTS

Sabarina B

Objective: This study investigated the effects of systemic and local factors on resorption of the posterior mandibular residual ridge under conventional complete dentures. **Methodology:** Proportional area measurements of the posterior mandible were made on panoramic radiographs of 87 edentulous patients who requested replacement complete dentures at the Faculty of Dentistry, University of Malaya. The amount of alveolar bone loss was expressed as a proportion of the predicted original height of the mandible in the area of the mental foramen, prior to tooth loss and any alveolar bone resorption. The resorption was classified as minimal and severe resorption. The use of proportions rather than actual measurements minimised errors related to magnification and distortion of the panoramic radiographs. **Results:** A total of 67% of the subjects studied had severe bone resorption. Female subjects above 50 years showed a higher risk for greater resorption. The number of years a patient had been edentulous was also a significant factor. Other factors like age of the subjects, reasons for tooth loss and systemic medical conditions, except the statistically significant effect of endocrine disorder, failed to show an association with the degree of resorption of the residual posterior mandibular ridge. **Conclusion:** This study shows that older female subjects may be at a greater risk of severe resorption of the mandibular ridge as a result of wearing complete dentures. Years of edentulousness also has significant association with the severity of bone resorption. Endocrine (thyroid disease) also has significant association with the severity of bone resorption.

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