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## EDITORIAL

### Promoting Awareness in Oral Health

Awareness among the population on the preventive aspects and the early symptoms and signs of disease is helpful in avoiding illness as well as their early detection and timely management.

In the field of Oral Health it is postulated that a substantial burden of ill health could be avoided by proper preventive care by the people themselves with considerable saving of professional time and ancillary resources.

Strategies for promoting awareness vary with the many influencing factors that one has to cope with. These include,

**The people** - their literacy, comprehension and background education - their maturity age-wise and interest in their own health status.

**The providers of health care** - their policies and levels of commitment with provision of resources and recognition.

**The modes of promoting awareness** - these range from one to one discussions with a dental professional at a consultation to use of group awareness techniques and the mass media. All these approaches are beneficial and the choice of the methods is determined by professional interest, the level of available resources and the cooperation

of the people. Developing countries have to make do with whatever is affordable and sustainable.

***The scientific basis of maintaining good oral health*** - the main concern in oral health care centered around diet – avoidance of certain types of food (e.g. sugar and carbohydrates etc. ) with regular cleaning of the teeth after meals and a periodic visit to a dentist. This was, and is still, being widely propagated in the awareness programs. Today the focus of prevention is concerned with the presence of fluoride in the correct proportion in the water and in tooth paste and the use of sealant by the dental professionals during the periodic visits of the patients.

***The commitment of the Professional Associations*** - the Sri Lanka Dental Association (SLDA) is fully committed to preventing the burden of ill health due to oral disease and is promoting the establishment of “Programs to Build Awareness in Oral Health.” The Association hopes to spread the message of awareness through out the entire country depending on the availability of resources. However at present the effort is focused on the school children.

The School Oral Health Awareness Program of the Sri Lanka Dental Association.

This was organized in close collaboration with the Ministry of Health and the Ministry of Education. The program has started as a pilot study in the Uva Province. A teacher and twenty students were selected from ten schools (n=210). They were given a briefing at a lecture session followed by small group discussions on the strategy of the program. They were expected to go back and spread the messages of awareness to the other teachers and students. The content related to methods of prevention of dental caries periodontal disease and oral cancer; good oral hygiene, and information on the importance of preservation of teeth –restorative dentistry. It is proposed to evaluate this study and follow it with a second study in the Kegalle District.

The Sri Lanka Dental Association is committed to improving the standards of Oral Health Care of all the people of Sri Lanka in close collaboration Ministries and ensuring the highest standard of professional competence and ethics.

**Ganananda Nanayakkara**  
**Editor (SLDJ)**

# Systematic Review in Evidence Based Dentistry

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## Introduction

Medical and Dental Practitioners and also students are continuously bombarded with information about the efficacy of drugs and chemicals, the superior qualities of materials and treatment procedures, the reliability of diagnostic methods etc. and they are in a quandary regarding what to believe and how to choose the best for their patients. Printed journals and the internet are the source for the most recent information while text books could be regarded as outdated by the time they are published and teachers may not be reliable! Pharmaceutical industry through their promotional campaign too target the practitioner with claims of superiority of their products very often supported by evidence based on research reliability of which is uncertain.

Most of this information and knowledge is produced by research. Therefore obviously the reliability of the information will depend on the quality of the research which produced the information. Statements such as “it is my experience.....” and “this always work well in my hands...” can no longer be accepted as evidence to support the reliability of a particular drug or a method of treatment. The degree of reliability of research publications too has been graded according to their type; randomized controlled trials being graded the highest and case reports the lowest.

In view of the above the dental practitioner in order to be modern and well equipped with reliable information and knowledge must have the skills necessary to acquire that knowledge. The busy practitioner may not have the time to carry out a comprehensive review of the subject that he or she is interested in. The concept of Evidence-based Medicine and Dentistry has emerged mainly to serve the busy practitioner to help him to be updated by reliable and scientific methods. Systematic review is the most important tool that is currently being used for the development of the concept of Evidence-based Dentistry.

## What is Evidence – based Dentistry?

Evidence – based Dentistry is a computer based system that is geared to supply reliable evidence that support the answer to a particular clinical problem confronting the practitioner. The dentist may be faced with the problem of deciding whether a new treatment procedure is superior to the one that he or she has been practising in the past. The decision he or she makes would be more critical in a country where litigation is a strong possibility in case the treatment fails. Further, now-a-days the patients are also well informed via the internet about the treatment modalities that are available Evidence-based Dentistry system relies on several well developed websites in the internet which would efficiently and quickly supply the necessary

information to the practitioner. Thus the busy practitioner, if he has the necessary skills could access the information he needs and therefore improve and modernize his practice.

### **What is Systematic Review?**

Systematic Review is a system of primary research that sifts the medical literature in an objective and transparent fashion with the primary aim of minimizing bias and error<sup>1</sup>. All information necessary for the practice of evidence based dentistry ideally has to be subjected to a systematic review. The method adopted in a systematic review is broadly similar to primary research methodology. A knowledge of the methodology employed in Systematic Review would be useful to those who wish to contribute to the development of Evidence-based Dentistry, and also to those who intend to practice in an evidence based environment. It would be useful to prospective writers of research papers whose publications may in the future be subjected to a Systematic Review. A Systematic Review would also help to identify the need for further research.

This paper attempts to introduce this subject but by no means it is a detailed account of Systematic Review. Reader is referred to the authors cited here for more details.

### **Features of a Systematic Review**

As mentioned earlier Systematic Review is considered to be a form of primary research. It

attempts to identify all studies that are relevant to the subject and then to critically evaluate them by pre-established selection criteria. Such an evaluation will result in the selection of those studies that effectively address the problem. Finally a synthesizing or a summarizing would enable the question to be answered. This process must ensure that as in primary research error and bias are minimized. Thus a Systematic Review would have the essential features of a research paper, aims (research question), a search plan which is equivalent to “ materials and methods”, results, discussion and conclusions. The search plan must have selection criteria, databases, text terms to be used in the search, gray literature and any other factors that may influence the search.

### **Starting the process**

A problem faced by a clinician could be the subject for a Systematic Review. For instance clinicians are often confronted with the question whether symptom free impacted wisdom teeth in young patients should be removed. Thus the research question may be designed as follows; should symptom free impacted wisdom teeth in young patients be removed? The research question would have four components which are either explicit or implicit; (1) Type of feature or prevalence (2) Type of outcome (3) Type of lesion, procedure or structure and (4) Type of control<sup>2</sup>. In the above question type of prevalence would be symptom free impacted wisdom teeth in young patients. Type of outcome is not explicit but it would be prevention of symptoms and complications. Type of procedure is the removal of wisdom teeth. Type of control is not given in the question but it would be a group of patients whose impacted wisdom teeth are managed conservatively.

## Selection Criteria

After the research question is designed the next step is to determine the Selection Criteria. It is the selection criteria which will sift the relevant literature. These criteria could be either “inclusion” or exclusion<sup>3</sup>. It is necessary to define the width of these criteria, it would be either “recall” or “precision”, where recall will produce large numbers while precision will produce specific studies. Sources of bias too must be minimized. The reviewer has control over some of the sources of bias while over others he has little control.

## Search Plan

The literature search in a Systematic Review should be based on a written search plan which is similar to the “materials and methods” section. It should be appropriate and reproducible. The important aspects in the search plan are the “key words”, the databases to be searched, whether the search is to be restricted to one language or more languages, what areas of the “grey literature” are to be considered. The “key words” have to be carefully selected and they could be subject headings or free texts.

## Literature Search

Electronic databases that are used in medical literature search is the Medline and its PubMed interface. Access to these databases has been made free by the USA government. “Controlled subject headings” such as MeSH or Emtree of Medline may be used. This may be combined with free text terms using Boolean operator (“or”, “and”,

“not”). Subject headings are listed in a “controlled vocabulary” and are used by indexers to indicate the content of the articles. MeSH which is a “controlled vocabulary” has specific terms assigned to each identified topic. Emtree of Medline is another such vocabulary. Subject headings are so organized that it is easy to browse through them. MeSH searches could be supplemented with free text terms using Boolean operator “and”.

## Application of selection criteria and analysis

The studies identified in the literature search will then be sifted using predetermined selection criteria. In this exercise blind and independent assessment of the data has to be carried out in order to avoid reviewer bias. Statistical techniques could be used to test for bias before conclusions are arrived at.

## Recommendtions

Systematic Review could help clinicians and also health policy makers to cope with the overwhelming load of information. If a Systematic Review for instance could establish that all impacted wisdom teeth in young patients need not be removed it would help the clinicians as well as health policy makers.

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## Research Article 1

### Evaluation of applicability of Moyers mixed dentition space analysis for Sri Lankan Sinhalese Orthodontic patients.

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#### Abstract

**Introduction** - Mixed dentition analysis to predict the mesio-distal dimensions of unerupted canines and premolars is an essential part of orthodontic diagnostic procedures, which is carried out to determine the amount of space available for the accommodation of erupting permanent teeth. The Moyers probability tables developed on a sample of white American children of European descent are currently used worldwide.

**Objectives** - As it has been well established in the literature that mesio-distal tooth size varies considerably between different racial groups, the purpose of the present study was to determine the applicability of Moyers probability tables for mixed dentition analysis for Sri Lankan Sinhalese orthodontic patients.

**Material and Methods** - The sample consisted of randomly selected 134 subjects equally divided by sex. Only cases with class I malocclusions with minimal incisor irregularity were included in the study. Mesio-distal dimensions of all four mandibular incisors, canines and premolars of both arches were measured by the same investigator. Mesio-distal dimensions of canines and premolars were predicted using Moyers probability tables. True mesio-distal dimensions of mandibular canines and premolars were compared with predicted mesio-distal dimensions using t test for paired sample data.

**Results** - Results revealed for males 50<sup>th</sup> percentile level of probability was accurate and for females 75<sup>th</sup> percentile level was accurate. Therefore, the 75% level of probability as recommended by Moyers can be used satisfactorily for males. For female subjects the protection on the side of crowding as predicted by Moyers will not be available if 75% probability level is used. Therefore, Moyers prediction tables should be used for Sri Lankan Sinhalese female Orthodontic patients with caution.

**Key words** - Mixed dentition analysis, Moyers probability tables

#### Introduction

Orthodontic treatment is usually carried out in the early permanent dentition stage. This allows accurate assessment of the malocclusion as the full extent of the malocclusion is established with the eruption of all permanent teeth mesial to permanent molars. In contemporary orthodontics

there is a trend among clinicians to begin treatment at an earlier age<sup>1</sup>. This trend towards earlier treatment demands better comprehension of malocclusions and their diagnosis<sup>2</sup>.

One of the conditions among orthodontic problems requiring early treatment is when there is a

discrepancy between the tooth size and the space available in the dental arch to accommodate erupting large permanent teeth. When the orthodontist is faced with this problem of tooth arch size discrepancy, management of such space discrepancies made easy if the deficit could be predicted early in the development of occlusion which will enable the clinician to institute appropriate method for management of such conditions. This prediction of space required for the developing teeth refers to as mixed dentition analysis. Mixed dentition analysis is carried out to predict the size of unerupted canines and premolars, which is an important part of early orthodontic case assessment. This helps to determine the amount of space available in both maxillary and mandibular arches for accommodation of erupting canines and premolars. It is important to carry out mixed dentition analysis accurately as this determine the space needed for accommodation of permanent teeth. Depending on the results of mixed dentition analysis different methods of managing space are adopted. These methods range from serial extractions, guidance of eruption, space maintenance, space regaining or to just observation of the patient until the permanent dentition is established.

Blacks'<sup>3</sup> averages on mesio-distal tooth size is the first reference in the literature, which has made an attempt in forecasting sizes of unerupted teeth. Clinically these average values are not reliable as there is a great variability of tooth size between different individuals. Several other methods have been subsequently developed in an attempt to obtain greater accuracy for predicting the sizes of unerupted teeth<sup>4-9</sup>.

There are three basic methods used in prediction of size of unerupted canines and premolars in contemporary orthodontics.

#### **1. Measurement of the unerupted teeth on radiograph**

The method of measuring unerupted teeth on radiographs has been used clinically for

a long period<sup>10</sup>. This requires an undistorted radiographic image, which is more easily achieved with individual periapical films. With any type of radiograph it is necessary to compensate for enlargement of the radiographic image This is done by measuring an object that can be seen both in the radiograph and on the casts, usually a primary molar tooth. The true size of the unerupted tooth is estimated by using a simple proportional relationship. The accuracy of this method is fairly good depending on the quality of the radiograph and the position of teeth in the dental arch. This technique can be used in both maxillary and mandibular arches and for all ethnic groups. Only disadvantage is the need for obtaining radiographs of teeth.

#### **2. Estimates from the proportionality tables**

There is a reasonably good correlation between size of the erupted permanent lower incisors and total width of the unerupted canines and premolars. This relationship between lower incisors and total width of canines and premolars has been tabulated for White American children of European descent by Moyers<sup>7</sup>. To utilize Moyers prediction tables, the mesio-distal width of the four lower incisors is measured and the total value is used to predict the size of both upper and lower unerupted canines and premolars. The accuracy with this method is fairly good for Northern European White children on whose data it is based, despite a tendency to over estimate the size of unerupted teeth. A further advantage is that no radiographs are required and the table can be used for both maxillary and mandibular arches in both sexes.

#### **3. Estimates using regression equations**

Tanaka and Johnston developed a prediction equation using the mesio-distal

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width of erupted lower incisors to predict the size of unerupted canines and premolars. This method has good accuracy despite a small bias towards over estimation of the size of unerupted teeth.

Out of these methods Moyers probability tables<sup>7</sup> are the most widely used in current orthodontics as the predicted tooth size can be read directly from the tables. Moyers probability tables are available for both males and females and also for both maxillary and mandibular teeth. According to Proffit and Fields, the accuracy of Moyers measurement is fairly good for Northern European white children on which data is based, despite a tendency to overestimate the size of unerupted teeth. As these tables are developed from data obtained from a different populations, the accuracy of these methods is doubtful when applied to a population with different ethnic origin. Because it has been well established in the literature that mesio-distal tooth sizes vary considerably between different racial groups<sup>11-19</sup>.

As there are no such probability tables available for present study population, the purpose of the study was to determine the applicability of Moyers probability tables in the mixed dentition analysis for Sri Lankan Sinhalese orthodontic patients.

### Material and methods

The sample studied consisted of 134 Sri Lankan children 67 males and 67 females randomly selected from orthodontic records collected between 1997 and 2001 in the University Orthodontic unit which satisfied the selection criteria.

Following criteria were used to select the sample

1. Sinhalese children between 13 to 15 years of age.
2. All cases with class I malocclusions.
3. All cases where all permanent teeth mesial to permanent molars are present and fully erupted.

4. No obvious loss of tooth material mesio-distally as a result of caries, fractures, inter-proximal wear, and congenital defects
5. Only cases with good study casts available made of hard plaster without impressions flaws.
6. Cases with minor lower incisor irregularities in order to facilitate accurate measurement of lower incisor sizes.

Mesio-distal dimensions of all four mandibular permanent incisors and both maxillary and mandibular permanent canines and first and second premolars were taken using digital micrometer (Mitutoyo, Japan) read to the nearest 0.01 mm. Mesio distal dimensions of teeth were obtained by measuring the maximum distance between mesial and distal anatomical contact points as described by Hunter and Priest<sup>20</sup>. All the measurements were taken by the same investigator in order to reduce the examiner variability. Intra examiner reliability was assessed by measuring 15 study models two weeks later without referring to the original measurements. Statistical analysis was done using SPSS version 10- statistical package. The intra examiner variability was assessed using t test for paired sample data. There was no statistically significant difference between means of two measurements ( $P > 0.05$ ). Measurements taken for both males and females were tabled separately as there is a proven differences of teeth between females and males. Sexual dimorphism has been confirmed in several studies with specific teeth statistically significantly larger in males than in females<sup>11-19</sup>. True mesio-distal dimension of canines and premolars were compared with predicted width of the same group of teeth using Moyers probability tables for both males and females for maxillary and mandibular teeth using t test for paired sample data.

### Results

The total sample consisted of records of 67 males and 67 females. The total mesio distal dimensions of erupted lower incisors and true total mesio distal

dimensions of permanent canines, first premolars and second premolars are shown in table 1 for both maxilla and mandible in both males and females. The difference between the right and left sides of the teeth was not statistically significant. (5% Alpha level). Therefore, results of the detailed statistical analysis are given only on right side. There were statistically significant differences between tooth sizes between males and females. Therefore, the data were analyzed and reported separately. Table 2 shows the values predicted using erupted lower incisors from Moyers Probability

tables at different percentile levels. The results of paired sample t tests for predicted values and true dimensions are shown in table 3 for males and in table 4 for females. There was no significant difference between predicted values and true values for males at 50<sup>th</sup> percentile level in both maxilla and mandible ( for maxilla P= 0.279, for mandible P= 0.729). There was no significant difference between predicted value and the true value in both maxilla and mandible in females at 75<sup>th</sup> percentile level ( For maxilla P = 0.695 and for mandible P= 0.432).

**Table 1 - Mean mesio-distal tooth dimensions of groups of teeth.**

Size of Groups of teeth in mm.	Male (n=67)			Female (n=67)		
	Mean	SD	SE	Mean	SD	SE
Lower incisors	22.38	1.34	0.17	22.13	1.36	0.16
Maxillary Right 3,4,5	21.25	1.02	0.12	21.12	1.13	0.14
Maxillary left 3,4,5	21.12	1.11	0.13	21.09	1.35	0.16
Mandibular Right 3,4,5	20.77	1.10	0.14	20.53	1.03	0.13
Mandibular left 3,4,5	20.64	1.16	0.14	20.43	1.22	0.14

3=permanent canine, 4=first premolar 5=second premolar.

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**Table 2** - Predicted mean values taken from Moyers probability tables for permanent canine first premolar and second premolar (3+4+5).

Probability level in Moyers table (Percentile)	Maxillary		Mandibular		Maxillary		Mandibular	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
25th	20.56	0.68	19.96	0.60	19.66	0.39	19.26	0.73
35th	20.77	0.66	20.36	0.63	19.93	0.39	19.60	0.72
50th	21.10	0.70	20.77	0.59	20.37	0.38	20.07	0.71
75th	21.67	0.66	21.56	0.58	21.06	0.38	20.63	0.71
95th	21.88	0.66	21.91	0.58	21.075	0.38	21.01	0.72

**Table 3** -Results of t test for paired sample data for males

True and predicted values	Maxillary			Mandibular		
	Mean	(+/- 1SD)	P	Mean	(+/- 1SD)	P
True value	21.26	1.02	<0.001	20.77	1.10	<0.001
Moyer's 25th percentile	20.56	0.68		19.95	0.60	
True value	21.26	1.02	<0.01	20.77	1.10	<0.05
Moyer's 35th percentile	20.77	0.66		20.35	0.63	
True value	21.26	1.02	NS P=0.279	20.77	1.10	NS P=0.729
Moyer's 50th percentile	21.10	0.70		20.76	0.59	
True value	21.26	0.97	<0.001	20.77	0.10	<0.001
Moyer's 75th percentile	21.067	0.66		21.056	0.58	
True value	21.16	0.97	<0.001	20.77	1.10	<0.001
Moyer's 95th percentile	21.88	0.66		21.91	0.58	

NS=Non significant, True value= measurements taken after eruption of teeth.

Predicted value = values taken from Moyers prediction tables before eruption of teeth using measurements taken from erupted four lower incisors

**Table 4** - Results of t test for paired sample data for Females

True and predicted values	Maxillary			Mandibular		
	Mean	(+/- 1SD)	P	Mean	(+/- 1SD)	P
True value	21.12	1.13	<0.001	20.53	1.03	<0.001
Moyer's 25th percentile	19.67	0.39		19.26	0.73	
True value	21.12	1.13	<0.01	20.53	1.03	<0.05
Moyer's 35th percentile	19.97	0.39		19.61	0.72	
True value	21.26	1.13	<0.001	20.53	1.03	<0.001
Moyer's 50th percentile	21.37	0.38		20.07	0.71	
True value	21.12	1.13	NS P=0.695	20.53	1.03	NS<0.001 P=0.72912
Moyer's 75th percentile	21.67	0.38		21.63	0.71	
True value	21.12	1.13	<0.001	20.53	1.03	<0.001
Moyer's 95th percentile	21.75	0.72		21.01	0.72	

NS=Non significant, True value= measurements taken after eruption of teeth.

Predicted value = values taken from Moyers prediction tables before eruption of teeth using measurements taken from erupted four lower incisors.

## Discussion

Orthodontists are interested in predicting the potential for tooth and arch size discrepancy in their growing patients. If accurate predictions can be made while patients are still in the mixed dentition stage, it is possible to attempt interceptive procedures to prevent or to correct developing malocclusions due to tooth arch size discrepancy. The prediction of mesio distal dimensions of unerupted canines and premolars should be made accurately for each patient by reducing to a minimum the errors involved in measurement and judgment. Conversely, if such discrepancies cannot be made accurately one would unnecessarily either retain teeth or extract teeth while attempting interceptive procedures on mixed dentition patients. If the tooth size cannot be predicted accurately one would question the advisability of mixed dentition analysis to predict the size of unerupted canines and premolars on a given population.

Moyers probability tables which are widely used for prediction of mesio distal size of unerupted canines and premolars are derived from a population of Northern European descent. Theoretically, one should use the 50% level of probability, since any error would then distribute equally both ways. Experienced clinicians may choose to use the 50% prediction since it is the most precise estimate. Clinically however, we need more protection on the side of crowding than on the side of spacing. Therefore, those who are inexperienced or without the use of cephalometrics do well to proceed more conservatively. Therefore, 75% probability level is recommended by Moyers for use for prediction of tooth dimensions of unerupted canines and premolars. Application of such table to a population with a different ethnic origin is not accurate without investigating, as it has been shown that there are racial and ethnic variations in tooth size<sup>21-23</sup>.

Present study reveals that for the Sri Lankan Sinhalese males the prediction at 50% probability level is accurate for both maxillary and mandibular

arches. But for Sri Lankan females only 75% level is accurate for both maxillary and mandibular arches. The reason for this may be due to both sexual dimorphism and ethnic variation. The findings of the present study is in agreement with similar studies carried out on different populations.

Van der Merwe S W et al. studying on a sample of 200 cases from Western Cape Caucasian population have compared the true size of the canines and premolars with the values predicted using Moyers probability tables and found significant differences at all probability levels. In a study carried out by Jaroontham J and Godfry K on a sample of 430 from Thai population has shown that prediction at 50<sup>th</sup> percentile level underestimates the tooth size summation of canines and premolars. al-Khadra studying on a sample of 34 patients from Saudi Arabia found that 35% level probability is more accurate than 50<sup>th</sup> percentile level. In a study carried out by Ursus R Schirmer et al. on a sample of 100 Black patients of South African origin found that 85<sup>th</sup> and 95<sup>th</sup> percentile probability levels are accurate for maxilla of females. For the mandibular teeth of females and for both maxillary and mandibular teeth of males predictions using Moyers prediction tables were not accurate.

As 50<sup>th</sup> percentile level of probability is accurate for Sri Lankan Sinhalese males prediction with 75<sup>th</sup> percentile probability level from Moyers probability tables will provide satisfactory prediction of tooth dimensions of unerupted canines and premolars. Present study reveals that for Sri Lankan females prediction at 75<sup>th</sup> percentile probability level is accurate. Therefore, the advantage of protection on the side of crowding recommended by Moyers will not be available for Sri Lankan females if 75% probability level is used. This can result in underestimation of the amount of crowding and lead to treatment failure. There is an increasing trend to commence orthodontic treatment in the mixed dentition which is one way of reducing the cost of treatment by applying interceptive measures in mixed dentition stage among Sri Lankan orthodontic settings. Therefore, mixed dentition analysis which

predict the tooth size of unerupted canines and premolars has become an important diagnostic procedure. As probability tables for such prediction is not available for Sri Lankan population at present, Moyers probability tables can be used for Sri Lankan Sinhalese males with accuracy. If Moyers

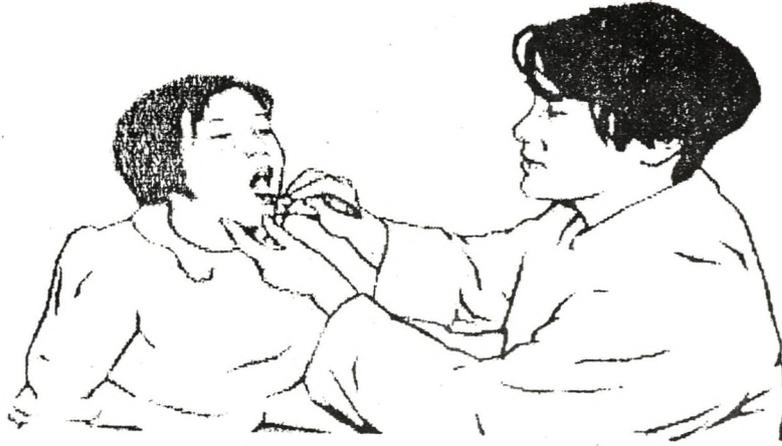
probability tables are used for prediction of tooth size of canines and premolars for Sri Lankan females, prediction at 75<sup>th</sup> percentile level of probability should be interpreted with caution as it can underestimate the tooth sizes leading to treatment failure.

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## Research Article 2

### Awareness of bleeding from the gums in a group of employed adults in Sri Lanka

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#### Introduction

Epidemiological data indicate that periodontal diseases are a major oral health problem affecting almost any population in the world<sup>1,2,3</sup>. The National Oral Health Survey of Sri Lanka (1995-1995)<sup>4</sup> has shown that 97.5% of the adult population is suffering from periodontal diseases.

It is well established that prevention and management of periodontal disease is largely dependent on plaque control at both professional and individual level particularly due to the fact that gingivitis is preventable and reversible and that periodontitis is manageable<sup>5</sup>. Hence the focus of prevention should be on improving the knowledge of the causes, signs and symptoms of the condition in individuals. As periodontal disease is a relatively symptomless condition until late stages, the individual should have sufficient knowledge to identify the early signs and take appropriate action in terms of prevention or treatment if the disease process is to be reversed.

Several studies on awareness of signs and symptoms of periodontal disease have found the awareness to be low not only among lay people but also among health professionals. These studies include a Finnish study in which the degree of awareness of bleeding gums in the study population was found to be as low as 40%<sup>6</sup>. Shamsler et al. reported that 60% of medical practitioners of a community care centre in the UK had stated that their gums bleed on

brushing while only 21% were aware that gingival bleeding was a sign of periodontal disease. These findings could partly be due to the relatively symptomless nature of periodontal disease.

The objective of the present study was to assess the level of awareness of the earliest sign of periodontal disease, namely bleeding gums in relation to disease severity, age, gender occupational status, educational status, and oral hygiene practices in a group of employed adults in Sri Lanka.

#### Subjects and Methods

##### Study Sample

The study group consisted of 257 subjects drawn from three institutions in Kandy district namely, the University of Peradeniya (n=89), a factory (n=80) and a teachers' training College (n=88). In selecting the subjects the following methods were used. A systematic random sampling technique was used for selection of factory workers. With regard to teacher trainees, the entire junior batch of teacher trainees was included and all non academic employees of two faculties in the University of Peradeniya were included in the study. Selection criteria for inclusion in the study were 1) no history of systemic diseases, 2) free from any oral mucosal conditions, which has direct relevance to gingivae, 3) Two or more dentate sextants in the mouth, 4) not pregnant at the time of examination.

## Method

An interviewer-administered questionnaire was used to obtain socio-demographic data and awareness of bleeding gums in the study population. A trained interviewer was used for this purpose. Prior to the study the questionnaire was pre-tested by the author on a group of patients who attended the Periodontology clinic, Faculty of Dental Sciences, University of Peradeniya and necessary modifications were made. Comparing the scoring of the examiner with the scoring of an experienced clinician validated the accuracy of recording periodontal data. There was 100% agreement between the two scorings.

A clinical oral examination was carried after administering the questionnaire. A simplified periodontal examination for dental practices based on the Community index of Treatment needs - CPITN was used for the periodontal examination. The examiner had no knowledge of the responses to the questionnaire. A dental chair side assistant recorded the data in a specifically designed form under the direct supervision of the examiner. Information was collected from 15-20 participants per day. Informed consent was obtained from subjects who were selected to be included in the sample.

### Examination procedure

Periodontal status was assessed using community periodontal index of treatment needs<sup>8</sup>. All teeth except the third molars were examined in a sextant before assigning relevant scores to the sextant. In this study non-hierarchical scoring was used. Instead of recording only the worst score, all scores pertaining to the different periodontal disease indicators were recorded for a sextant. The assumption that a given higher score invariably meant the existence of lower scores was not made. For example, if a given sextant had both bleeding and calculus that sextant was given scores 1 and 2 instead of giving score 2 only. This modification

was made since the objective of the study was to assess the symptom awareness of the subject. Hence it was absolutely necessary to detect all sites with bleeding. A sextant with  $\leq 1$  teeth was recorded, as missing and single tooth in a sextant was included in the adjacent sextant for scoring. Only the teeth, which are fully erupted into the oral cavity, were recorded as present.

Analysis of data was carried out using a SAS package. Chi-square test was used to compare differences between groups.

## Results

The study sample consisted of 257 subjects (105 females and 152 males). The mean age of subjects was  $32.1 \pm 8.93$  years. The sample consisted of three occupational groups according to the Registrar General's classification of occupations in Sri Lanka, namely code 3 (49.8%) which included clerks, teachers, typists and technical assistants, code 4 (36.6%) included skilled laborers, lab attendants, machine operators and code 5 (13.6%) included unskilled labourers in the present study group

Fifty nine percent of the subjects had received school education whilst 41% had obtained technical or higher education. The study sample was categorized into three age groups; 20-29 years (n=135), 30-39 years (n=64) and 40 years and above (n=58).

The awareness of symptoms of the sample was analyzed according to the severity of bleeding, mode of cleaning teeth, level of education, occupational status and age of the patient.

### Awareness of bleeding and severity of bleeding

Only 5.5% of the sample was free of bleeding on probing. There was bleeding in one sextant in 7.8% of the sample. There was bleeding in all six sextants

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in 38.5% of the study group. Nearly 26% of the population had bleeding in relation to 1-3 sextants, whilst 67.8% had bleeding on probing in 4-6 sextant (Table 1). Although 243 (94.5%) in the study group had bleeding on probing only 43.6% of them were

aware of bleeding from their gums. Within the group who were aware of this symptom a statistically significant association was found between the awareness of bleeding and severity of bleeding ( $P < 0.01$  -  $X^2 = 18.292$ )

**Table 1:** Symptom awareness and severity of bleeding in the study group

No. of sextants with bleeding on probing	Subjects with bleeding	Subjects not aware of bleeding n (%)	Subjects aware of bleeding n %
0	14 (5.5%)	12 (85.7%)	2 (14.3%)
1	20 (7.8%)	15 (75.0%)	5 (25.6%)
2	24 (9.3%)	17 (70.8%)	7 (29.2%)
3	25 (9.7%)	18 (72.0%)	7 (28.6%)
4	34 (13.2%)	18 (52.9%)	16 (39.6%)
5	41 (16.1%)	25 (61.0%)	16 (39.6%)
6	99 (38.5%)	44 (44.4%)	55 (55.6%)

$P < 0.01$ ,  $X^2 = 18.292$

**The relationship of severity of bleeding with age, educational status and work place**

Table 2 section (a) shows the distribution of the severity of bleeding according to age group. There

was no statistically significant association between the severity of bleeding gums and age group ( $p = 0.395$ ).

**Table 2:** Relationship between severity of bleeding, age, level of education, and occupational status (% are given in Paranthesis)

Variable	0	1	2	3	4	5	6	p.value
<b>(a) Age</b>								
20 – 29 years (n=135)	9 (6.7)	15 (11.1)	12 (8.9)	12 (8.9)	14 (10.4)	20 (14.8)	53 (39.3)	0.395
30 – 39 years (n=64)	3 (4.7)	4 (6.3)	7 (10.9)	5 (7.8)	11 (17.2)	14 (21.9)	20 (31.4)	
40 e” (n=58)	2 (3.4)	1 (1.7)	5 (8.6)	8 (13.8)	9 (15.5)	7 (12.1)	26 (44.8)	
<b>b) Education</b>								
School (n=151)	4 (2.7)	10 (6.6)	10 (6.6)	15 (9.9)	19 (12.6)	27 (17.9)	66 (43.7)	0.055
Technical or Higher (n=106)	10 (9.5)	10 (9.5)	14 (13.3)	10 (9.5)	15 (14.3)	14 (12.4)	33 (31.4)	
<b>c)Occupational Status</b>								
3* (n=128)	10 (7.8)		1 - 3 sextants 45 (35.2)				4- 6 sextants 73 (57.0)	0.007
4** (n=94)	2 (14.3)		18 (26.1)				74 (42.5)	
5*** (n=35)	2 (5.7)		6				27 (77.1)	

\*3=teacher / typist / clerk / technical assistant \*\*4=machine operator and skilled labourer and  
\*\*\* 5 = unskilled labourer lab attendant

#### Awareness of bleeding from the gums in a group of employed adults in Sri Lanka

Table 2 section (b) shows the relationship between bleeding gums (CPITN Score 1) and the educational status of the study group. The percentage of subjects with no gingival bleeding was higher in the group with technical or higher of education (9.5%) than in the group with school education (2.7%). The percentage of subjects with bleeding in 1-3 sextants was higher in the group with higher level of education than in the group with lower level of education (32.4% vs 23.2%). However there was no statistically significant relationship between the educational status and the number of sextants with bleeding in the study population.

This trend was reversed with respect to bleeding in 4-6 sextants; the group with a lower level of education had a higher percentage of subjects with bleeding in 4-6 sextants (74.2%) compared to the group with higher educational level (58.1%).

Table 2 (c) shows the association between bleeding

on probing and the occupational status. Due to the small numbers the subjects, who had 1-3 sextants with bleeding and 4-6 sextants with bleeding were grouped together for statistical analysis. It was found that there was a statistically significant relationship between the occupational status and the number of sextants with bleeding. The occupational group three had the highest percentage (7.8%) of subjects with no bleeding (CPITN Score 0) and the highest percentage (35.2%) of subjects with CPITN Score 1 in 1-3 sextants.

#### **The relationship of awareness of bleeding with age, educational status and work place.**

Table 3 shows relationships between awareness of bleeding and age group, educational status, and work place. It was found that there were no statistically significant relationships between awareness of bleeding and age group, educational status or work place.

**Table 3:** Relationships between awareness of bleeding with age group, educational status and the place of work.

Variable	Total Sample	Aware	Not aware	P value
<b>(a) Age</b>				
20-29 years	126	55 (43.7%)	71 (56.3%)	0.13
30-39 years	61	32 (52.5%)	29 (47.5%)	
40 years e''	56	19 (33.9%)	37 (66.1%)	
<b>(b) Education</b>				
School Education	147	61 (41.5%)	86 (58.5%)	0.52
Technical or higher education	96	47 (48.9%)	49 (51.1%)	
<b>(c) Work place</b>				
Factory	79	36 (45.6%)	43 (54.4%)	0.395
University	83	37 (44.06%)	46 (55.4%)	
Teachers	81	33 (40.5%)	48 (59.3%)	

**Awareness of bleeding and Mode of cleaning teeth**

As shown by Table 4 there was a statistically significant relationship between mode of cleaning

and the awareness of bleeding. The awareness of bleeding was highest (66%) in the group of subjects who used both the brush and the finger to clean their teeth followed by the group of subjects who used only the brush to clean their teeth (40%).

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**Table 4:** The relationship between awareness of bleeding and mode of cleaning teeth

Variable	Total *	Aware	Not aware	P value
<u>Mode</u>				
Tooth brush	178*	72 (40.4%)	106(59.6%)	0.009
Tooth brush and finger	38*	25 (65.8%)	13 (34.1%)	
Finger	27*	9 (33.3%)	18 (66.3%)	

\* Subjects who had bleeding on probing at the time of examination only (n=243) were included in this table

**Relationship between mode of cleaning and severity of bleeding**

(Total sample is included in the analysis since the table deals with severity of bleeding )

It was who found that the group who used only

the finger to clean their teeth had highest percentage of subjects (92%) with bleeding in 4-6 sextants, followed by brush and the finger group (76%). The association between mode of cleaning and severity of bleeding was statistically significant. (P<0.05) (Table 5).

**Table 5:** Relationship between mode of cleaning and severity of bleeding

Mode	No of sextants with bleeding(%)							Total
	0	1	2	3	4	5	6	(% of total)
Tooth brush only #	13 (92.9)	16 (8.4)	20 (10.5)	23 (12)	23 (12.0)	34 (17.8)	62 (32.5)	121 (74.3)
Tooth brush and finger #	0 (0)	4 (10.)	3 (7.9)	2 (5.3)	6 (15.8)	4 (10.5)	19 (50)	38 (14.8)
Finger only	1 (7.1)	0 (0)	1 (3.6)	0 (0)	5 (17.8)	3 (10.7)	18 (64.3)	28 (10.9)
Total	14 (5.5)	20 (7.8)	24 (9.3)	25 (9.7)	34 (13.2)	41 (16.1)	99 (38.5)	257 (100)

$X^2 = 21.813$        $p < 0.05$       # = column %

## Discussion

This study investigated the awareness of bleeding gums in a group of employed adults. Presence of bleeding was detected using non-hierarchical scoring of community periodontal index of treatment needs. Since CPITN is primarily an index of treatment needs, recording the worst score (hierarchical scoring) for a sextant is sufficient to determine the treatment need for a sextant. However when the CPITN was used for estimation of the presence of a condition, it has been reported that there was over estimations with regard to different scores given. For e.g. in a Japanese study there has been a 47% over estimation of bleeding<sup>9</sup>, when recording the presence of calculus it was assumed that bleeding was present without making an attempt to detect bleeding. Since the objective of the present study was to assess the awareness of bleeding it was necessary to determine the presence of bleeding in each and every gingival unit. Therefore the present study recorded all scores indicating the existence of positive periodontal disease signs in a sextant (non- hierarchical scoring) instead of recording the worst score (hierarchical scoring). This enabled to obtain the true picture of periodontal disease signs of study group with respect to bleeding, calculus, shallow pockets and deep pockets.

There was a high prevalence of bleeding from the gingiva on probing (94.5%). Only 5.5% of the study group was free of gingivitis. The awareness of bleeding observed in the present study (43.6%) was higher when compared with studies carried out in other parts of the world. A Finnish study<sup>6</sup> reported the level of awareness of bleeding as 40%. In another Finnish study<sup>10</sup> it has been reported that 46% of the study group noticed bleeding from their gums. The differences in results could be attributed to the variations in composition of three study groups, differences in methodology, and the level of disease in the groups studied. Finland, in particular is a country with a very well organized dental health education programme, and provides free dental care up to the age of 18 years. Well

organized oral health education programmes in the school dental health services may have resulted in lower levels of disease in Finnish study sample. Therefore in the two Finish populations<sup>5&9</sup> the severity of bleeding may have been less than the Sri Lankans thus reducing the chance of detection of gingival bleeding. In the present study group approximately 68% of subjects had bleeding in 4-6 sextants. Further, in the Finnish study (Tervonen et al. 1988) bleeding was not recorded sextant wise: instead hierarchical scoring of the CPITN was carried out. Hence strict comparison with the present study is not possible. The present study found a statistically significant association ( $p < 0.01$ ) between the awareness of bleeding and severity of bleeding as assessed by the number of sextants with bleeding (Table 1). This may be due to quantitative increase in bleeding which enhances the possibility of a subject being aware of bleeding.

However out of 99 subjects who had bleeding in all six sextants, only 55.6% noticed bleeding. It may partly be attributed to the scoring method used in the present study in which even if one gingival unit of a sextant bled on probing a positive score was given to the whole sextant. Therefore those who did not notice bleeding despite bleeding detected in all sextants would have had bleeding in few gingival units. Thus reducing the possibility of its detection by the subjects.

When considering the age and the bleeding there was a trend towards an increase in the severity of bleeding with age but this was not statistically significant. Other studies<sup>11,12,13</sup> have reported statistically significant associations between age and severity of periodontal disease. However strict comparison between these studies and the present study is not possible due to the methodological differences between studies.

With the increase in the level of education and/or the occupational status, the number of sextants with bleeding decreased (Tables 2 b, 2c). This finding is in agreement with the results of previous studies

where it was found that the severity of bleeding was associated with the socio economic status<sup>14</sup>. Dental epidemiological studies in the United States of America have shown that the severity of periodontal disease is related to the occupation<sup>15</sup>; the periodontal status of high income professional persons were markedly superior to that of the lower paid workers. This was supported by studies carried out in United Kingdom<sup>16</sup>.

There was a statistically significant association between the awareness of bleeding and the mode of cleaning teeth ( $p < 0.01$ ) and also between severity of bleeding and mode of cleaning ( $P < 0.05$ ) (Table 4 & 5). This may indicate that the awareness is related to the mode of cleaning. According to the mode of cleaning teeth, the highest percentage of subjects with bleeding in 4-6 sextants was in the group of finger users (92%) followed by inconsistent brush (brush and finger) users (76%) and the consistent brush (only brush) users (62%). The awareness of bleeding was highest in the inconsistent brush users (76%) followed by the consistent brush users (62%) and the finger users (33%).

The highest awareness of bleeding (66%) was recorded in the group who used both the finger and the brush. This may be attributed to two factors. First, the use of a toothbrush can cause provocation of the gingival tissues, which result in bleeding during brushing. Further, 50 % of the group had bleeding in 4-6 sextants. Since this group of subjects was occasional toothbrush users it may be reasonable to assume that this group would have had more gingival units which were inflamed and hence the use of the toothbrush may have provoked bleeding in the subjects. Their toothbrush use may have facilitated the detection of bleeding by the subject. These findings substantiate the results of Kallio et al<sup>17</sup> who suggested that toothbrush is a reliable method of self-detection of bleeding. However the highest awareness of bleeding was not reported in the brush users of the present study. This may be due to the fact that the severity of

bleeding was lowest in brush users. They may have had less number of bleeding gingival units in a given sextant. This is quite possible since even when one gingival unit of the sextant bled on probing, bleeding on probing was recorded for the sextant in this study. Bleeding from a few gingival units may easily go unnoticed by the subject.

The present study showed that the awareness of bleeding gums was low among the study group. This suggests that the participants may not be dentally conscious to detect bleeding gums, or it may be that the participants' knowledge of bleeding as a sign of periodontal disease is low.

The awareness of bleeding increased with increasing severity of bleeding. However a substantial percentage of subjects were unaware of bleeding. This may not be very satisfactory from the point of view of prevention and early intervention of periodontal disease. The lack of knowledge about early signs of periodontal disease may have contributed to this low awareness. Further, failure of dentists to inform patients about existing periodontal disease<sup>18</sup> due to failure in diagnosis or any other reason and their failure to inform the patients about the presence of periodontal disease has also been reported has also been cited as a cause of low awareness of periodontal disease<sup>13</sup>.

In conclusion the present study showed that the level of awareness of bleeding gums in the employed populations was low. There were significant associations between severity of bleeding and mode of cleaning teeth and awareness of bleeding.

Lack of organized oral health education programmes in Sri Lanka may be a factor, which contributed to low awareness of an important early sign of periodontal disease. Therefore it is very important that oral health education programmes be planned in order to raise the knowledge of early signs of periodontal disease.

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**THE EMOTIONAL EFFECTS OF TOOTH LOSS IN EDENTULOUS AND PARTIALLY DENTATE PEOPLE IN SRI LANKA: A PRELIMINARY STUDY.**

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**Abstract**

**Aim:** To investigate the emotional effects of tooth loss in a group of partially dentate and edentulous Sri Lankans, attending a private dental clinic.

**Method:** A questionnaire was completed by 25 partially dentate and 25 edentulous patients.

**Results:** None of the partially dentate subjects and only 3 of the edentulous participants had difficulty accepting the loss of their teeth. However the loss of teeth resulted in 52% of the participants restricting their choice of food, 38% no longer enjoying their food as much, 42% avoiding going out in public, 28% avoiding eating in public, 42% avoiding laughing in public, and 36% avoiding forming close relationships. Ninety percent of all the participants felt unprepared for the effects of tooth loss.

**Conclusion:** Although the loss of teeth clearly affected the daily living activities, the vast majority of Sri Lankan participants in this study had no difficulties in coming to terms with that loss.

**Introduction**

It is well recognised that the loss of natural teeth can have a significant impact on daily living activities such as speech, food selection and mastication<sup>1</sup>. Although the physical aspects of tooth loss have been studied extensively, the psychological reactions to tooth loss have been explored to a lesser extent<sup>2-4</sup>. Bergendal has acknowledged total tooth loss as a serious life event<sup>5</sup>, whilst more recently it has been shown that tooth loss can have a profound emotional impact on the lives of some people<sup>6-8</sup>. In a group of 94 edentulous people, Davis et al<sup>7</sup> found that 45% of the participants experienced difficulties in accepting the loss of their teeth. Similar difficulties were experienced by 53% of people from a group of 91 partially dentate subjects<sup>8</sup>. These people were more likely, than those who had no difficulties in accepting tooth loss, to feel less self-confident, enjoy their food less, avoid laughing in public, avoid eating in public and avoid forming close relationships.

Culture and lifestyle is likely to have a major influence on attitudes and values. Fiske et al<sup>9</sup> compared the emotional effects of tooth loss in partially dentate populations from London (in England), Dundee (in Scotland) and Hong Kong.

People from Dundee were less likely to have difficulties accepting tooth loss, whilst people from London took longer to come to terms with their tooth loss and were more likely to feel less confident. Fewer people in Dundee restricted their choice of food as a result of tooth loss and were more likely to enjoy their food. Out of the three groups the highest rates of tooth loss occur in Scotland <sup>10</sup>. It was postulated that the Dundee group perceive tooth loss as inevitable and consequently find it easier to come to terms with their situation.

Partially dentate people in Hong Kong were more likely to restrict their food choice, enjoy their food less and avoid going out in public. Similar restrictions in activities were reported in the Hong Kong group when the study was repeated in edentulous populations <sup>11</sup>. It was suggested that the impact on daily living activities in the Hong Kong group could be attributed to the great emphasis that Chinese people put on food and the eating experience. Eating in restaurants is a very common practice among Hong Kong people. Social gatherings and family occasions are often dining-orientated. Thus being disabled by missing teeth not only limits dietary selection and enjoyment, it also decreases the desire to go out in public.

Omar et al <sup>12</sup> explored the reactions to tooth loss in a group of edentulous people in Saudi Arabia. The over-riding response from almost all the forty four people interviewed was that their edentulous state was the will of God and as such it was not something to be questioned. In addition, it was something that was inevitable with old age. This unquestioning acceptance of tooth loss contrasted strongly with the lingering feelings of loss reported in Western societies <sup>7,8,9,11</sup>. and indicated the strong influence that culture can have on how people react to a given circumstance.

## AIM

The aim of the current study was to investigate the emotional effects of tooth loss in a group of partially

dentate and edentulous people attending a private dental surgery in Sri Lanka.

## Method

The questionnaire developed from the qualitative studies of Fiske et al. <sup>6,13</sup> was used in this study. It contained 24 questions plus a space for any additional comments that the participants wished to make about their experiences of losing teeth. The questionnaire was administered in the form of a structured interview.

The study sample comprised twenty five partially dentate and twenty five edentulous subjects. The sample selection used a random convenience method in that, from a given time, all the partially dentate and edentulous patients attending the practice were invited to participate in the study until the number of participants required was achieved. The participants all attended one dental practice in Galle, in the south of Sri Lanka and the interviews were all undertaken by one researcher (BGN) who was the dentist in charge of the practice.

Due to the small number of participants in the study, the results are presented descriptively.

## Results

### a) Profile of the study group

Twenty men and 30 women took part in the study. The majority of the participants (26, 52%) were aged between 31 and 50 years. Additionally, 8 participants (16%) were aged 30 years and under; 9 (18%) were between 51 and 70; and 7 (14%) were 71 years and over.

The gender and age range of the edentulous and the partially dentate groups were similar.

### b) Acceptance of tooth loss

None of the partially dentate people reported any difficulty in accepting the loss of their teeth. Three people in the edentulous group stated that they had

The emotional effects of toothloss in edentulous and partially dentate people in Sri Lanka: A preliminary Study.

difficulties accepting their tooth loss. Not surprisingly when asked "how long it was before you felt you had accepted losing your teeth", 84% of all the participants (42 people) stated that this had happened immediately. Of the remaining 16%, all but one person had come to terms with their tooth loss within one year.

#### **c) Emotions related to tooth loss**

The overriding emotion related to the loss of teeth was that of sadness with 48% of the edentulous group (12 people) and 64% of the partially dentate group (16 people) expressing this reaction. Only two people in each group were unconcerned at losing teeth.

#### **d) Restrictions in activity**

People were asked to state how the loss of teeth affected their confidence. Thirty two percent of the edentulous group and 20% of the partially dentate group felt less confident about themselves, whereas 40% and 72% respectively stated that their confidence was unaffected. The remaining participants felt unable to answer this question.

The study group was also asked to indicate whether or not they had been restricted in carrying out a range of activities as a consequence of losing teeth (Table 1). The impact of tooth loss on food selection and enjoyment, on going out and laughing in public, and on forming close relationships was similar between the two groups, with restrictions in the choice of foods being the most frequent complaint. The results suggest a trend towards the impact of tooth loss having a greater influence on restricting eating in public in the partially dentate than in the edentulous group (40% and 16%, respectively).

#### **e) Preparation for tooth loss**

Asked if they felt prepared for the effects of tooth loss, 84% of the edentulous group (21 people) and 96% of the partially dentate group (24 people) reported being unprepared for the effects. Those people who felt unprepared for the effects of tooth loss were requested to indicate which, if any, of the following items would have helped them: a video

about the effects of tooth loss; a leaflet about tooth loss; an explanation from the dentist; or the opportunity to talk to someone who had already experienced tooth loss. Forty (88%) of the forty five people who were eligible to answer this question stated that they would have liked written information in the form of a leaflet. Only one person thought an explanation from the dentist would have helped.

### **Discussion**

The fact that only 3 people found it difficult to accept losing their teeth contrasts sharply with studies carried out in England, Scotland and Hong Kong where 44% of an edentulous study group<sup>11</sup> and 49% of a partially dentate group<sup>9</sup> reported difficulties accepting their loss of teeth. The Sri Lankan results are however consistent with those obtained from a group of edentulous people in Saudi Arabia<sup>12</sup>, where there was an unquestioning acceptance of the loss of teeth. The Sri Lankan participants showed no evidence of the lingering feelings of loss that have been reported in Western societies. A person's reaction to tooth loss will be influenced by their cultural and religious beliefs. An important tenet of Sri Lankan life is to show tolerance in the face of adversity. Consequently to question the loss of teeth would be to question this cultural principle and ideology. In addition, in many societies, it is considered normal to lose teeth as a natural consequence of growing old<sup>14,15</sup>. Such beliefs would inevitably lead to the general acceptance of tooth loss.

Although there was a general acceptance of tooth loss amongst the participants, this did not make them immune to its consequences. In total 52% of the participants were restricted in their choice of foods, whilst 38% no longer enjoyed their food as much. In addition, combining the results for both the edentulous and partially dentate groups, 42% avoided going out in public, 28% avoided eating in public, 42% avoided laughing in public and 36% avoided forming a close relationship as a consequence of tooth loss. Interestingly these

percentages are similar to restrictions in activities reported by Scott et al<sup>11</sup> and Fiske et al<sup>9</sup> in their studies of groups of people in England, Scotland and Hong Kong. Thus what would seem to distinguish the participants in Sri Lanka, is not the consequences of tooth loss but their ability to accept those consequences.

This difference between the consequences of tooth loss and acceptance of it is seen most strikingly in the Sri Lankans response to the questions “Did you feel prepared for the effect that the loss of your teeth had on you”. In total 90% of all the participants felt unprepared for the effects of tooth loss. Thus it would appear that whilst the people in this study were prepared to accept the extraction of teeth, they were unaware of how this would impact on their daily lives. When asked to select what would help them prepare for the effects of tooth loss the majority of participants stated they would have found a leaflet on the subject helpful. Only one person thought the dentist ought to provide an explanation. This is a very different response to that obtained from a previous study in the United Kingdom where the majority of people thought that the responsibility for providing an explanation lay with the dentist <sup>7</sup>. This could well reflect differences between the ways in which the general population relates to the medical and dental professions. In

Western society it is now more common for patients to question and challenge the decisions of their dentists. The professional status of the dentist and doctor no longer protects them from close scrutiny not only by society in general but also from individual patients. Whilst patients in Sri Lanka may at the present time not subject their dentists to such scrutiny, this may change in the future, as society changes. Indeed it will be interesting to see if people’s attitudes to tooth loss also change. Meanwhile it would be a simple matter to produce a leaflet to inform people of the possible impact and effects of tooth loss and satisfy the patient need identified by the current study.

### Conclusion

Overall the Sri Lankan participants in this study accepted their tooth loss and the restrictions that this placed on their daily activities without difficulty. There were no lingering feelings of loss or resentment, which have been reported in Western societies. Although accepting their tooth loss, 90% of the participants felt they could have been better informed regarding the effects of tooth loss and 88% of them would have appreciated being given a leaflet detailing these consequences.

**Table 1** : Percentage distribution of activities restricted by tooth loss

Percentage of responses				
Restricted activity	Edentulous		Partially Dentate	
	Yes	No	Yes	No
Choice of food	56	44	48	52
Going out in public	44	56	40	60
Eating in public	16	84	40	60
Enjoyment of food	36	64	40	60
Laughing in public	44	56	40	60
Forming close relationships	32	68	40	60

The emotional effects of toothloss in edentulous and partially dentate people in SriLanka: A preliminary Study.

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# ECTOMESENCHYMAL CHONDROMYXOID TUMOUR OF THE ANTERIOR TONGUE

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### Introduction

The ectomesenchymal chondromyxoid tumour of the anterior tongue (ECTT) is a recently described clinicopathological entity of the anterior dorsum of the tongue. It is a slow growing, painless tumour located in the anterior tongue with no age or sex predilection. Histologically the tumour is composed of well circumscribed, unencapsulated lobular proliferation of loosely arranged ovoid or fusiform cells in a chondromyxoid stroma.

Immunohistochemical studies reveal positivity to glial fibrillary acidic protein (GFAP), cytokeratins, S-100 and smooth muscle actin.

This report documents a case of ectomesenchymal chondromyxoid tumour of the anterior tongue in a 24 year old male.

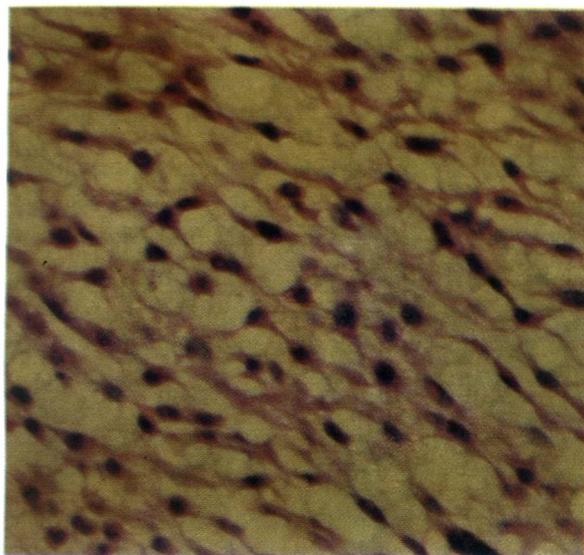
### CASE REPORT

A 24 year old male presented to OMF unit of Teaching Hospital, Karapitiya with a small lump in the anterior dorsal surface of the tongue for one

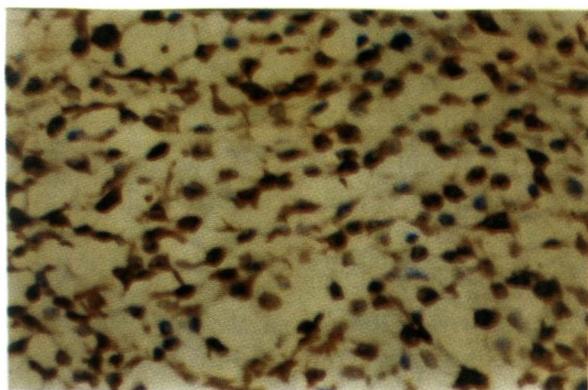
year duration. The lesion was painless and slightly increased in size with time. Oral examination revealed a circumscribed non ulcerated reddish small lump of about 0.5 cm diameter. The initial clinical diagnosis was a mucocele. There was no cervical lymphadenopathy. The lesion was surgically removed under local anesthesia with adequate margins.

**Fig 1.** - Low power view of Ectomesenchymal chondromyxoid tumour of the anterior tongue. (H & E magnification x 40)





**Fig 3** - ECTT showing GFAP positivity (Magnification x 400)



Histological examination of the specimen revealed a well circumscribed tumour composed of loosely arranged fusiform and ovoid cells in a markedly myxoid stroma (Figs 1&2). The cell borders were poorly defined with slightly basophilic cytoplasm. The tumour was arranged into lobules divided by fibrous septae. The cells did not show any cytological atypia. The margin of the tumour was

well defined. Salivary tissue was not found in the specimen.

Immunohistochemically the tumour was positive for glial fibrillary acidic protein (Fig. 3) and S-00. Keratin and smooth muscle actin were negative.

The histopathological features and immunohistochemical stains were supportive of the diagnosis of ectomesenchymal chondromyxoid tumour of the anterior tongue.

### Discussion

The case reported in the present study is similar to the previous cases of the ectomesenchymal chondromyxoid tumour of the anterior tongue published to date in the literature. It was first described by Smith et al <sup>1</sup> in 1995. The tumour tends to occur at any age with a peak incidence in young to middle aged adults. There is no sex predilection. The tumour evolution is highly variable, ranging from one month to several years.

The ECTT presents as a sub mucosal nodule in anterior dorsal tongue. The overlying mucosa may get ulcerated if the tumour encroaches it. Although the tumour appears to occur in the anterior tongue, occasional cases have been reported from the posterior tongue<sup>2</sup>.

Histologically the tumour arises in the superficial dorsal muscles. It is a well circumscribed lesion with lobular proliferations divided by fibrous septae. The margins are usually well defined. However, inclusion of muscle fibres at the periphery of the lesion was reported in some cases<sup>3</sup>. The lesion consists of ovoid or fusiform cells arranged in a chondromyxoid or hyalinized stroma. The nuclei

## Ectomesenchymal Chondromyxoid Tumour of the Anterior Tongue

are round or lobular with slightly basophilic cytoplasm. Eosinophilic cytoplasmic nuclear pseudoinclusions may be present<sup>4</sup>. Some tumours may exhibit atypical areas with nuclear pleomorphism and hyperchromatism<sup>5,6</sup>.

Although immunohistochemical results are variable, GFAP and cytokeratin show strong positivity. Actin and S100 reveal weak positivity.

The presence of chondromyxoid stroma may be a feature in a wide spectrum of lesions. Accordingly, soft tissue myxoma, nerve sheath myxoma, pleomorphic adenoma, oral focal mucinosis, ossifying chondroma, glial chondroma, myxoid chondrosarcoma, myoepithelioma and ossifying fibromyxoid tumour may have to be considered under the differential diagnosis of ECTT. However, pleomorphic adenoma and myoepithelioma may appear very similar due to their myxochondroid nature and similar immunohistochemical profiles. Ductal structures are not evident in ECTT and salivary tissue is not found in close proximity to the lesion.

Recurrence may follow if the tumour is inadequately removed during first surgery<sup>1</sup>.

According to the histopathological and immunohistochemical characteristics Smith et al suggested that the tumour may derive from ectomesenchymal cells and later differentiate into myxoid and chondroid areas<sup>1</sup>. Van der wal et al suggested a myogenous origin as some tumours incorporate muscle fibres within the lesion<sup>3</sup>. However, the absence of strong positivity for muscle markers may contradict the above theory. In summary, ECTT can be regarded as a rare benign lesion and surgical excision with adequate margins appears to be the treatment of choice. The diagnosis

should be arrived with the co-relation of immunohistochemical and histopathological features.

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*With Best Compliments  
From*

M/s. Darley Butler & Co., Ltd,  
98, Sri Sangaraja Mawatha,  
Colombo 10.

Marketers of



*Super Quality Tooth Brushes*



## **AND FOREMOST**

**As the Dental Care Leader in Sri Lanka, Signal has several firsts to its credit.**

- 1<sup>st</sup>** to introduce a clinically proven toothpaste and toothbrush in Sri Lanka.
- 1<sup>st</sup>** to launch fluoride toothpaste in Sri Lanka.
- 1<sup>st</sup>** to introduce a superior fluoride system (NaF in Silica base).
- 1<sup>st</sup>** to bring the innovative 3 angled toothbrush.
- 1<sup>st</sup>** to be professionally accepted by the Sri Lanka Dental Association (SLDA).
- 1<sup>st</sup>** to conduct islandwide dental support programmes for school children.
- 1<sup>st</sup>** to organise mobile outreach programmes for village communities (through mobile dental clinics, dental seminars and educational exhibitions).
- 1<sup>st</sup>** to promote an International Dental Congress in Sri Lanka.

**Signal 2**

**LEADING DENTAL PROTECTION**