Original Research Article

Patterns of Tooth Extraction in Government Dental Clinics of Three Districts in Sri Lanka

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Abstract: Dental diseases are major public health problem in developing world which can be prevented and treated if diagnosed early. In developing world preservative treatments such as restorations, endodontic treatments are expensive for economically marginalized communities and extractions may be the easier alternative in terms of finance and time. This study was designed to understand the causes and patterns of extraction of permanent and deciduous teeth in relation to socio – demographic conditions in Sri Lanka. A cross sectional descriptive study was undertaken in three public dental clinics in Kurunegala, Matale, Polonnaruwa districts of Sri Lanka. Patients who has undergone tooth extraction during the period of 23th July 2016 to 06th August 2016 at above institutions were included to the study. The data were recorded by interviewing the dentist and patients using a questionnaire form. Efforts to preserve more natural teeth of the population should focus on the prevention and treatment of caries and periodontal diseases. Besides the preventive measures, dental education programmes for the population together with dental professionals needs to be implemented, in the purpose of improving oral hygiene and insisting on conservative therapy than extraction.
Keywords: Tooth Extraction, Dental Caries, Sri Lanka

INTRODUCTION

Understanding the patterns and the causes for tooth loss is important for social, functional, psychological and economic reasons. Dental diseases are major public health problem in developing world which can be prevented and treated if diagnosed early. In developing world preservative treatments such as restorations, endodontic treatments are expensive for economically marginalized communities and extractions may be the easier alternative in terms of finance and time [1]. Therefore formulation of strategies and the planning of dental health service require the surveys and studies investigating the reasons and patterns for tooth loss, in order to achieve WHO (World Health Organization) goals of retaining at least 20 teeth at the age of 80 years in an individual's mouth which has not been achieved yet in many countries [2].

Studies investigating the causes for tooth extractions have been carried out in many countries, mostly in developed industrial Europe [3-6]. The result of those studies showed that dental caries and periodontal diseases were the most common causes for tooth loss. While dental caries and periodontal disease are the most common reasons for tooth extractions, age, gender, socio- economical and attitudinal characteristics tend to influence the tooth loss of population [3]. Studies have shown that subjects of low income and low education are more prone to be edentulous than their counterparts [4]. A study on correlation between gender and reasons for tooth extraction showed more teeth loss in less educated rural male population. [5] Some studies reported that, people living in rural areas have less access to dental services than urban which leads to accumulation of tooth extraction demands in the rural population [6].

Limited number of studies were carried out in Sri Lanka to determine prevalence of oral diseases. A study carried by Prof. Lilani Ekanayake and Dr. R. Perera about the tooth loss in Sri Lankan adults shows the overall prevalence of tooth loss is high among Sri Lankan adults which is 81.6% [7]. This study was designed to understand the causes and patterns of extraction of permanent and deciduous teeth in relation to socio – demographic conditions in Sri Lanka with a convenience sample of subjects from Matale, Kurunegala and Polonnaruwa districts.

METHODOLOGY

A cross sectional descriptive study was undertaken in three public dental clinics in Kurunegala, Matale, Polonnaruwa districts of Sri Lanka namely Teaching Hospital Kurunegala, District General Hospital Matale, General Hospital Polonnaruwa. Patients who has undergone tooth extraction during the period of 23th July 2016 to 06th August 2016 at above institutions were included to the study. After taking informed consent patient's data were recorded including patient's age, gender, ethnicity, socio- economic status, educational level. The data were recorded by interviewing the dentist and patients using a questionnaire form.

ANALYSIS OF DATA

The data were entered and analyzed using Microsoft Excel 2007 and Minitab version 16. Percentages are shown by bar charts. Chi square test and Goodman Kruskal statistical test are used to test the association between causes for tooth extraction and the selected demographic data.

RESULTS

Out of 209 subjects, 290 teeth were extracted. Among them 83 were males and 123 were females. The age range of the study population was 05 – 74 years and majority of them were between 21 – 50 years age. 65.05% of study subjects were Sinhalese and 13.10% were Tamils with 21.84% Muslims. Out of the sample 77 were from Kurunegala, 65 from Matale and 64 from Polonnaruwa districts. They lived in urban areas 45.15% with majority of (54.85%) rural area.

Table 1: Number and percentage of teeth extractions according to age groups including the proportions of male and female

Age Group	Male		Female		Total	
<=10	2	0.69%	4	1.38%	6	2.07%
11-20	13	4.48%	16	5.52%	29	10.00%
21-30	20	6.90%	31	10.69%	51	17.59%
31-40	17	5.86%	40	13.79%	57	19.66%
41-50	25	8.62%	33	11.38%	58	20.00%
51-60	24	8.28%	25	8.62%	49	16.90%
61-70	10	3.45%	22	7.59%	32	11.03%
>70	6	2.07%	2	0.69%	8	2.76%
Total	117	40.35%	173	59.66%	290	100.00%
DF = 7 P- value = 0.200						

The group age 31-40, 41-50 make up about the same proportion of 20% each and represented the highest number of extracted teeth in the present study. (Table 1) In all age groups females experienced significantly more extractions than males. The teeth extracted, about 49% were from patients up to age 40 years and 51% from the patient above the 40 years of age and 69% were from up to 50 years of age.

Of this sample 39.6% were extracted due to caries, 28.6% due to periodontal reasons, 6.21% for trauma, 11.38% for eruption problems, 1.35% for orthodontic reasons and 7.61 for other reasons which is mainly for perceive demand of patients to extraction. The relationship between causes and gender didn't show statistically significant differences with Goodman – Kruskal Gamma statistical test (p>0.005).

In the 21-30, 31-40 years of age groups shows highest percentage due to caries while 41-50, 61-70 years of age groups shows most common in periodontal diseases. (Figure 1) 51-60 years of age group reported with caries as the most common cause. In <=10 age group has reported developmental problems such as supernumeraries as the most common cause. Orthodontic reasons accounted slightly higher than

caries in 11-20 years of age group. Trauma accounted with nearly equal percentage in 11-20, 31-40, 51-60, and 61-70 years of age groups. Patients perceive demand for extraction accounted in a noticeable percentage in every age group in this study population. The relationship between causes and age groups was highly significant statistically (P = 0.001).

Lower posterior teeth are the most common tooth type which was extracted and upper anterior teeth are the least common tooth type in the study population. Lower anterior teeth were extracted due to periodontal reasons (18.1%) with more prevalence while upper anterior teeth due to traumatic reasons (5%). Lower posteriors and Upper posterior were extracted due to caries as most common reason (23.8% & 15.3%). Eruption problems reported equal percentage on both upper and lower posterior with 5%. Significant number of posterior teeth was extracted due to orthodontic reasons. The rural population lost more teeth due to caries (20.7%) and periodontal reasons (16.6%) than urban (18.9%, 1.9%) and this was more prevalent in rural females (21.9%) than females in urban area (18.5%). Difference between tooth loss due to caries and gender was not statistically significant.
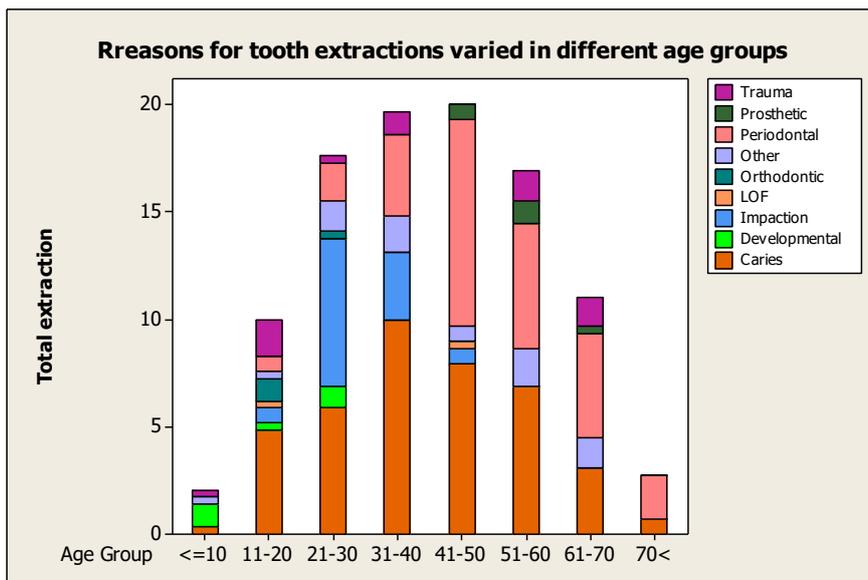
Fig-1: Distribution of reasons for tooth extractions varied in different age groups

Concerning the distribution of tooth extraction according to age, the age group with most extracted teeth was 31-40 years of age in rural population and 41-50 years in urban population (Figure 2:). The result also indicated increase in tooth loss in 11-20 years of age group in urban population than rural population which may be due to high amount of sugary food intake in urban children. Tooth loss in rural area, the population above 40 years of age shows great accrescence than rural area.
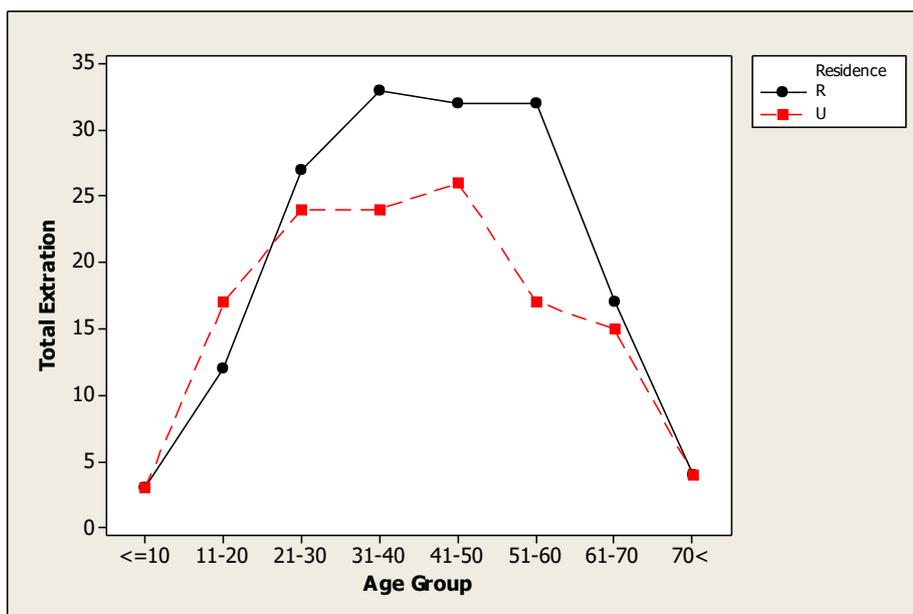

Fig-2: Distribution of tooth extraction in different age groups in rural & urban area

DISCUSSION

Tooth loss is a fundamental to assessment of oral status in a given population. As untreated dental disease will ultimately end up in tooth loss, it could be considered as a crude estimate of the oral health status of a given population. Prevention of tooth loss is an important goal in oral health care provision due to the increased attention to its psycho-social and functional consequences on the wellbeing of an individual [8, 9].

Though the study population may be vary from the Sri Lankan population, the survey team expected that the result of the present study might reflect the country as a whole because it covers three major districts in Sri Lanka which represent similar socio-demographic distribution respectively for the country. And this study involves the public dental clinics that contain comprehensive facilities for wide varieties of treatment and to which the majority of population can be easily accessible for their treatment needs. It is believed that the present study therefore reflect the

effect of socio- demographical factors as well as patients personal attitudes bear on the treatment carried out by practicing dentist.

The correct classification of the causes of tooth extraction was crucial for the validity of this study. Several factors were considered when formulating the system, which confirmed as far as possible to previously used internationally defined criteria [10, 11]. It is also important to remind that an extraction of teeth is not only based on disease related factors. Studies showed that it is substantially influenced by factors related to patient, dentist and environment. These factors may include the dentist philosophy of practice, his experiences as well as patient demand and attitude for extraction and socio- demographic status of both patient and country [12].

The observation of this study showed that, caries was the major cause of tooth loss in most of the population, both in urban and rural communities with an increasing in age, the incidence to extract tooth due to periodontal reasons also increased. This is an agreement with several other studies [3-6] and the results of third national oral health survey (NOHS) [13]. The findings of NOHS suggest a notable burden of advanced dental caries with regards to deciduous teeth with implications for intervention. Periodontal problems were not the major cause of extraction in the younger population of this study. The study confirmed the trend that periodontal diseases is the most frequent reason for tooth extraction in patients over 40 years of age as shown in previous studies [3-6, 14].

Patients demand for tooth extractions also reported as noticeable frequency mainly in rural areas. That may indicate the lack of health knowledge about modern dental treatments to rural community. It may suggest there should be a strong effort to take reduces this burden. Therefore health educational and health promotional events should be carried out respective area with focusing this matter.

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