

Oral disease patterns and tooth wear in the Veddas

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Summary

Oral disease patterns and tooth wear of 50 Veddas (29 males and 21 females) of the Kandaganwila colony were studied during 1971 - 1973. The average number of decayed, missing and filled teeth (DMF), the total number of teeth present, the attrition scores and abrasion scores were tabulated in three age groups, 7-14 years, 25-44 years and 45-65 years, separately from males and females. When compared with the DMF of other ethnic groups in the Badulla district for ages 12 years and 35-44 years from the national survey of 1983-1984 in both sexes, the Veddas have a significantly lower average number of decayed teeth and DMF.

The average number of teeth present in the adults in both sexes was 31 if two males with 27 and 14 teeth missing were excluded. There was no record of filled teeth. A high prevalence of functional third molars was observed. Both attrition and abrasion increased with increasing age. Although the prevalence of betel chewing was very high, oral premalignant lesions were not observed.

Key words: Veddas, decayed missing filled (DMF), functional third molars, tooth wear, attrition, abrasion.

Introduction

Oral health is an integral component of the general health of a community. The oral disease patterns in Sri Lanka have been highlighted in previous studies (1-6). These studies have established that there is a low prevalence of dental caries, especially in the permanent dentition (1), and a high prevalence of

periodontal disease (2). Periodontal disease has been shown to be associated with poor oral hygiene and severe gingivitis (3). Increased tooth mortality after the age of 40 years may occur owing to the increased importance of periodontal disease after this age (4, 5). The prevalence of rapid progression periodontal disease has been estimated at 8% (6). These studies however are limited to urban and estate populations. Comprehensive countrywide oral health surveys including rural, agricultural and estate and urban populations were carried out in 1983 and 1984 (7). These national surveys however did not include the Veddas, a distinct ethnic group in Sri Lanka. The Veddas are a primitive group of people still obtaining their food by means prevalent in an earlier phase of hominid evolution, namely hunting and gathering with very rudimentary agriculture.

Tooth wear is a function of the kind of food in the diet and of the methods of food preparation as well as certain manipulatory functions for which the teeth are frequently used. Tooth wear is measured by attrition, which has been defined as frictional wear of the teeth, and abrasion as a result of abrasive food (8). In certain primitive populations the use of teeth as tools can account for a large proportion of the attrition. Tooth wear has been shown to decrease in primitive groups with increasing urbanisation (9). In the Australian Aborigines, a primitive group similar to the Veddas in their physical anthropology, it has been shown that "living under civilised conditions" decreases tooth wear (10). Estimates of tooth wear have not been reported in any previous study in Sri Lanka. This paper reports the oral health patterns and tooth wear in the Vedda community at Kandaganwila during the period 1971-1973.

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Population and Methods

Three generation pedigrees were drawn of the 275 individuals of this community. Details of the field visits and population have been described earlier (11, 12). Fifty individuals (29 males and 21 females) with representation from each of the three generations have been studied for oral health patterns and tooth wear. Each individual was identified by a pedigree number. Prior to the intraoral examination the name, age and gender and betel and tobacco chewing habit were recorded. The intraoral examination was done by the first author with dental probe and mirror, with the subject seated and in natural light. The number of decayed, missing and filled teeth was recorded. Decayed teeth were scored according to the criteria of Moller and Poulsen (13).

The total number of teeth present and the number of fully erupted functional molars were also recorded. The degree of attrition and abrasion was scored on a 0-4 scale according to the criteria given by Molnar (14). The mucosa was examined for evidence of keratinisation, leukoplakia and keratosis. Dental impressions of the teeth were taken from 22 adults (13 males and 9 females) and 13 children (6 males and 7 females) for further study.

Results

The ages given in Tables 1 and 2 are those recorded at interview. The results are given separately for males and females in the following age groups; 7-14 years (8 males and 7 females) in the third generation, 25-44 years (10 males and 11 females) in the second generation and 45-65 years (11 males and 3 females) in the first generation.

Table I gives the average number of decayed, missing and filled teeth (DMF) and the average number of teeth present. The average number of missing, decayed and filled teeth at 12 years and at 35-44 years observed in the Badulla district in the national survey are also given for ease of comparison.

Table II gives the number of individuals with specific attrition and abrasion scores in the age

groups 7-14 years, 25-44 years and 45-65 years separately for males and females.

Discussion

The most striking feature of the dental health status of the Veddhas is the very low prevalence of dental caries. At all age groups it is less than one carious tooth per individual. There is also no trend towards increase in number of decayed teeth with increasing age. This conclusion is however subject to the limitation of a cross-sectional study.

When compared with the National Health Survey data (7) from the Badulla district, representing a rural population in the same geographical location for the age groups 12 years and 35-44 years, given in Table 1 the differences in the prevalence of caries is significantly lower ($p < 0.05$) in the Veddhas of both genders. With regard to the average number of missing teeth however, there is a low prevalence of 0.1 in the 7-14 years age group, which is similar to 12 year olds of the Badulla district, where no missing teeth have been recorded. In the 25-44 year group in the Veddhas the number of missing teeth remains less than one while in the Badulla district it is 3.8. There is no data from the National survey for comparison with the 45-65 year age group. The number of missing teeth in the Veddhas has increased to 4.1 in the males and 1.3 in the females in this age group. It must be mentioned however that this high figure in the males is due to one male aged 63 years with 27 teeth missing and another aged 60 years with 14 teeth missing. There is no record of filled teeth among the Veddhas. In the Badulla district too no fillings have been recorded in the 12 year group but in the 35-44 year group a value of 0.4 is given. Among the Veddhas, DMF in both the 7-14 year age group and the 25-44 year age group is significantly lower ($p < 0.01$) than that of the 12 year olds and 35-44 year olds of the Badulla district. The basic WHO criteria were used to identify caries in the national survey, whereas the more stringent Moller and Poulsen criteria were used in the present study. Had the WHO criteria been used the prevalence of caries among the Veddhas might have been lower.

Table 1. Average number of decayed missing and filled teeth (DMF) and average number of teeth in males and females in the three age groups studied

Generation No.	Age group in years	Sex	No.	Decayed (D)	Missing (M)	Filled (F)	DMF	Average number of teeth
III	7 - 14	M	8	0.5 (1.5) ^b	0.1 (0.0) ^b	0.0 (0.0) ^b	0.63 (1.5) ^b	Mixed dentition
		F	7	0.9	0.1	0.0	1.00	
II	25 - 44	M	10	0.3 (3.0) ^c	0.6 (3.8) ^c	0.0 (0.4) ^c	0.90 (7.2) ^c	32
		F	11	0.3	0.7	0.0	1.00	31
I	45-65	M	11	0.4	4.1 ^a	0.0	4.5	27 ^a
		F	3	0.0	1.3	0.0	1.3	31

a Two individuals had 27 and 14 teeth missing

b Caries experience in the Badulla district for 12 year olds according to national survey 1983-1984

c Caries experience in the Badulla district for the 35-44 age group according to national survey 1983-1984

Table 2. Number of individuals with specific Attrition and Abrasion scores

Generation No.	Age group in years	Sex	Attrition score					Abrasion score			
			0	1	2	3	4	0	1	2	3
III	7 - 14	M	2	2	3	-	-	7	-	-	-
		F	4	1	2	-	-	7	-	-	-
II	25 - 44	M	1	1	-	5	-	-	2	1	1
		F	-	-	-	6	1	-	4	-	2
I	45 - 65	M	-	1	2	3	5	-	3	2	4
		F	-	-	-	-	2	-	-	-	2

In respect of the average number of teeth present in the 25-44 year range it has been 32 for the males and 31 for the females. As mentioned earlier the average number of teeth present in the males of the 45-65 year age range has fallen to 27 because of two males with 27 and 14 teeth missing. If they were excluded the average would be 32. The average for the females remains at 31 at this age group too.

In the total sample of the national survey, in the 35-44 year group 7.1% has less than 21 teeth, 4.4% less than 15 teeth and 1.1% were edentulous. In the Badulla district however only 0.8% were edentulous. The periodontal status was not studied in the Veddas. The present study has established that the prevalence of dental caries is lower in the Veddas than in other ethnic groups in the Badulla district. The tooth

loss in the 45-65 age has been accounted for mainly by two individuals. Therefore it is likely that even periodontal disease is not a problem in the Veddas at all ages, and if at all is restricted to a few individuals with rapidly progressing disease.

The prevalence of oral premalignant lesions in adults has been estimated to be 4% in a countrywide survey (16). However a significant feature in the Veddas was the absence of any form of leukoplakia, keratosis or any other premalignant or malignant lesions, in spite of the evidence of a similar pattern of betel and tobacco chewing as in the Sinhalese living in surrounding villages.

In common with other primitive groups (15) the Veddas too retain functional third molars. Of the 14 males from whom information was available 9 had all four functional third molars and 3 had two. In the 11 females 8 had four and 2 had two functional third molars. As demonstrated in Table 2, both attrition and abrasion appear to be a natural biological process in the Veddas as in other primitive groups. Nearly 50% in the 7-14 age group have an attrition score of 0, 50% in the 25-44 age group an attrition score of 3, and 50% in the 45-65 age group have an attrition score of 4. A similar pattern is seen for abrasion. Heavy keratinisation observed in the mucosa and increasing attrition and abrasion with age indicates the use of fibrous material in the diet with strong frictional properties, perhaps unprocessed, undercooked or raw, with coarse grit.

The Veddas of Kandaganwila were relocated in Hennanigala of the Mahaweli System 'C' in 1982, where they live in close proximity to Sinhalese settlers. The data reported here was gathered twenty years ago. It would be interesting to see whether there is a secular trend towards decrease in tooth wear as has been established for the Eskimos with urbanisation (9) and for the Australian Aborigines (10) "living under civilised conditions", with a concomitant increase of dental caries in the Veddas in their new habitat.

The 22 dental casts which form part of the study

are at present with Dr. S. Sriskantha, formerly of the Faculty of Medical and Dental and Veterinary Sciences, University of Peradeniya.

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