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TOOTH AND LIP MUTILATION PRACTICES AND ASSOCIATED TOOTH LOSS AND ORAL MUCOSAL LESIONS IN THE MAKONDE PEOPLE OF SOUTHEAST TANZANIA

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ABSTRACT

Objective: To determine the prevalence of tooth and lip mutilation (TLM) and the prevalence of tooth loss and the associated oral mucosal lesions among adults in South East Tanzania.

Design: A cross sectional, clinical study and questionnaire administration.

Setting: Rural population in Southeast Tanzania.

Subjects: Randomly selected 217 adults aged 40 years and older.

Results: About 16% of all participants performed tooth mutilation. There were more females (20.6%) than males (11.3%) who performed tooth mutilation but the difference was not statistically significant. There was only about 17% of participants in the age group 40-54 years who performed tooth mutilation while there was 50% and 32% in the age groups 55-64 years and 65-95 years and the difference was statistically significant ($P < 0.001$). Tooth loss due to mutilation was significantly ($P < 0.001$) less than tooth loss due to other reasons in the anterior teeth and there was no tooth loss due to mutilation in the posterior teeth. Lip mutilation in form of piercing the upper lip and inserting a wooden stick called "ndonya" was found only in women. No oral mucosal lesions were found in this study group.

Conclusion: Tooth mutilation does not lead to significant tooth loss and lip mutilation and the use of "ndonya" does not cause oral mucosal lesions in this society. Extraction of anterior teeth due to other reasons was significantly higher than extraction following mutilation while in the posterior teeth there was no tooth loss due to tooth mutilation.

INTRODUCTION

In societies that practice permanent tooth mutilation it is usually done to certain types of teeth, mainly the anterior teeth and there is age specificity regarding the time at which mutilation is carried out (1,2). In Africa a type of deciduous tooth mutilation practice involving extraction of prominent tooth buds commonly referred to as "nylon teeth" or "the killer

deciduous tooth" by traditional healers has been reported in Tanzania and elsewhere in Africa (3-5). Extraction of deciduous tooth bud by traditional healers has been documented as one of the causes for deformed permanent teeth, and in severe deformities the permanent tooth may fail to erupt (6). Few studies have documented the existence of permanent tooth and lip mutilation practices carried out in some parts of Africa including Tanzania such

as piercing the upper lip and insertion of a wooden plug, called "*ndonya*", filing of anterior teeth and tattooing of the face (7-9). Lip mutilation and the use of a wooden plug known as *ndonya* by the local people in Tanzania have been suggested as causes of labial mucosal lesions such as gingival granuloma and tooth loss (9). Chipping off the enamel, which is a protective layer of the tooth leads to tooth sensitivity and/or pain, which may later on necessitate tooth extraction mainly due to lack of restorative dental service in the rural areas in the country. Moreover, chipping off the enamel may result into a decrease in thickness of the enamel thus loss of contact with the adjacent as well as occluding teeth, which will lead to tooth movement in search for contact, and when this continues for some time may lead to tooth loss as well (10,11). Reasons for permanent tooth mutilation reported among African countries and elsewhere include decorative purposes and tribal customs for passage from teenage to adulthood (11-14). The Makonde people of Southeast parts of Tanzania practiced lip mutilation as part of initiation rituals to adulthood (8,9). With modernisation the practice is no longer popular, but for those who had mutilations may have negative oral health consequences. Therefore, the aim of the study was first, to determine the prevalence of tooth and lip mutilation in the Makonde people of Southeast Tanzania, and second, determine prevalence of tooth loss and oral mucosal lesions associated with the mutilation practices.

MATERIALS AND METHODS

Two hundred and seventeen participants, 115 males and 102 females aged 40 years and older were recruited through a multi-stage random sampling using the ballot system in Mtwara region Southeast of Tanzania. The people of Mtwara are the Makonde people. A list of all six districts in the region was obtained from the regional authority, three districts were sampled using the ballot system, wards were sampled from the selected districts and villages were finally sampled from the wards in a similar manner. Age of 40 years and older was the only inclusion criterion, those below the age of 40 years were excluded from the study. All adults aged 40 years and older from each sampled village were invited to participate in the study. The aim of the study and the procedures for clinical examination were

clearly explained to the study participants. Informed consent was obtained from each participant before starting data collection. All the respondents who consented were interviewed using a structured questionnaire. Demographic data were obtained, which included age and gender. The questionnaire included a history of mutilation: whether one had performed chipping of part of a tooth, extraction due to tribal or customary reasons or not, and the age at which mutilation was done. Information on extraction due to pain from carious, mobile teeth or due to any other reason was also collected. Presence or absence of lip mutilation was observed by extra-oral examination and the status of dentition and presence or absence of oral mucosal lesions was determined by performing intra oral examination. The information was recorded in a standardised clinical form. The data from the questionnaire and clinical forms were entered into a computer and analysed using the statistical package for Social Sciences (SPSS) version 10.0. Chi Square test was used to determine the level of significance in relation to the differences among the groups and association between mutilation and tooth loss. The significance level was set at a probability $P \leq 0.05$.

RESULTS

The results revealed that out of the 217 study participants examined only 15.7% had performed tooth mutilation in form of chipping off part of the enamel on the upper and lower incisor-teeth so that the teeth appear peg-shaped (Table 1 and Figure 1). Lip mutilation was exclusively practiced by women who pierced the frenulum of the upper lip and introduced a wood plug with size varying from 0.5 to 2 cm in diameter and 2 to 4 cm long known as *ndonya* in the Makonde local language (Figures 2 and 3). A total of 93 out of the 102 female participants had complete information on mutilation practices, and out of these 28% had performed tipper lip mutilation by piercing and introducing the *ndonya*.

Tattooing of the face was also observed in all the males with tooth mutilation and in females who either performed tooth mutilation only or both tooth and lip (Figures 1 and 3). In Figure 2, a lady with *ndonya* is shown, with all maxillary incisors missing and extensive caries on posterior teeth, most of which the crowns are destroyed by caries. The remaining anterior teeth were also carious. The

major reason given for both tooth and lip mutilation was that, in Makonde tribe, culturally, it indicated that an individual has matured and thus has been promoted from childhood to adulthood.

An insignificant number of participants mentioned esthetic reasons such as good appearance

for tooth mutilation, and mutilation of lips and tattooing a sign of strength. Out of the 115 males, 13 (11.3%) had performed tooth mutilation while 21 (20.60%) of the 102 females had performed tooth mutilation (Table 1). The number of females with tooth mutilation was statistically significantly higher

Figure 1

Lower half of the face of a Makonde lady revealing filed maxillary and mandibular anterior teeth appear peg-shaped



Table 1

Prevalence of tooth mutilation by gender

Tooth mutilation	Male		Female		Total	
	No.	(%)	No.	(%)	No.	(%)
Yes	13	11.3	21	20.6	34	15.7
No	102	88.7	81	79.4	183	84.3
Total	115	100	102	100	217	100

P-value < 0.06

Figure 2

Oral cavity of a Makonde lady wearing a wood plug, occupying an edentulous area with all maxillary incisors missing. The posterior teeth are seen with extensive caries. Some crowns have been damaged due to caries



Figure 3

Face of a Makonde lady with her mouth closed revealing the 'ndonya' externally on the upper lip

**Table 2**

Prevalence of tooth mutilation by age

Age group (years)	Tooth mutilation		No tooth mutilation		Total	
	No.	(%)	No.	(%)	No.	(%)
40-54	6	17.6	107	58.5	113	26.1
55-64	17	50.0	40	21.9	57	26.3
65-95	11	32.4	36	19.7	47	21.5
Total	34	15.7	183	84.3	217	100

P<0.001

Table 3

Tooth loss in relation to mutilation and other reasons

Cause of tooth loss	Anterior tooth loss		Posterior tooth loss		Total	
	No.	(%)	No.	(%)	No.	(%)
Mutilation	81	21.7	0	0.0	81	4.7
Other reasons	293	78.3	1132	100	1625	95.3
Total	374	100	1332	100	1706	100

P<0.001

than for males ($P = 0.06$). A total of 34 out of 217 participants had performed tooth mutilation and among these 50% were in the age group 55-64 years and 32.4% in the age group 65-95 years, that is about 82% of those who had performed tooth mutilation were 55 years or more (Table 2). Anterior tooth loss due to mutilation was 20.4% and loss due to other reasons was 79.6% and the difference was statistically significant ($P = 0.01$). For the posterior segments, there was no tooth loss due to mutilation, thus 100% was due to other reasons (Table 3). There were no oral mucosal lesions observed in this study group.

DISCUSSION

In this study population about 18% of the participants performed tooth mutilation. Most of those who performed tooth mutilation (82%) were 55 years and older. This indicates that tooth mutilation is a dying cultural habit, as it was observed in only 26% of the younger age group 40-54 years as compared to the 82% in the older age groups. This is in agreement with a previous study in the same population by Gupta (8). Piercing of the upper lip and the use of *ndonya* was practiced exclusively by women and

28% had performed this type of mutilation, but no oral mucosal lesion was observed in this study. This contradicts a previous study done by Aanestad and Poulsen (9) on the same people, which reported gingival granuloma and excessive gingival recession as pathological conditions resulting from the use of *ndonya*. The differences could be explained by the fact that the criteria used to get the participants in our study and the previous study was different. The previous study was done on a small number of women who had moved to a different region and were selected from local contacts, so probably it could have been a cohort, who have been exposed to other factors (such as the type of tree used to get the wooden plugs) causing the mucosal lesions. This was a randomised study with almost ten times the number of participants so a better representation was expected and therefore more mucosal lesions were also expected, but this was not true. This is a strong indication that there could have been other factors for the lesions observed previously however, this study may indicate that the use of *ndonya*, which could probably be a risk factor for causing the lesions reported previously, is becoming unpopular due to social interactions and modernisation. Moreover out of all extracted teeth, only 20.40% were related to TLM and there was no significant correlation between TLM and tooth loss. Since more than 80% of participants who performed tooth mutilation were 55 years and older, this indicates that these practices are fading out in the younger generation.

In conclusion, tooth mutilation as well as lip mutilation with the use of *ndonya* in this study population is not associated with tooth loss or oral mucosal lesions. The extensive tooth loss observed was due to other reasons. We therefore recommend more studies to be done to encompass factors such as dietary habits, knowledge on oral health and other risk factors such as availability and utilisation of oral health services in this rural community.

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