Oral health status and related quality of life among elderly tribes in India

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Abstract

Introduction: Oral health reflects overall well-being for the elderly population. In elderly people, oral health contributes significantly towards quality of life (QOL). Good health is essential for older people to remain independent and to play a part in family and community life. Epidemiological data on health and its related issues are very important in order to plan for future health care provision. Objectives: To assess the oral health status, treatment needs and oral health related quality of life of using GOHAI index in elderly patients in Kalpetta. Methodology: A cross-sectional study was conducted in the elderly patients reporting to the OPD of Amritakripa Hospital, Kalpetta. Oral Health status was assessed by structured proforma and WHO oral health assessment form 2013 which included DMFT score, Periodontal status, Oral Mucosal lesions, Treatment needs etc. Oral health related quality of life was assessed by Geriatric oral health assessment index. Data analysis was done using SPSS version 20 and descriptive statistics were obtained. Results: The sample consisted of 214 females and 66 males. 70.7% of participants were illiterate. 96.4% of the population (270) were having daily wage <500. 59.3% of population were unaware about oral health problems. Emergency treatment was needed in 41.4% of population. On assessing oral health related quality of life, Male population found to have GOHAI score of 26.44 and that for the female population, it was 19.72. GOHAI score was compared for prosthetic status and age also. Considering the psychological parameters, suggest that this group of elderly in Kerala does not regard poor oral health as barriers to social interactions. Conclusion: The oral disease burden is very high in tribes. The prevalence of the tobacco habits is of concern. Education and motivation of these laity is needed to improve their oral health.

Keywords: Geriatric, General oral health assessment index, Gerontology, oral health status, oral health related quality of life

Introduction

With medical advancements that prolong human life, old age has taken on a new meaning in societies with the means to provide high-quality medical care.[1] WHO reports an annual increase of 1.7% of elderly with an increase of 2–5% of those above 65 years.[2] With the people above 80 years making the faster growing population in many countries the United Nations predicts that by 2050, 20% of world population will be above 80.[3]

Nevertheless societal status, gender, race and other communal factors also play major role in the aging process.[4]

According to 2011 census data, the tribal population constitute a substantial indigenous minority of the population in India, comprising of 9.01% of the nation's total population.[5] About 82% of the total tribal population is concentrated in Central and Western parts of the country whereas only 11% is dispersed in small pockets in the Southern states.[6] In Wayanad, tribal population lead a traditional way of life and accessibility to the modern technologies is meagre or even non-existent. Most physicians are not aware of oral disease-burden, which often lead to underestimation and mismanagement of disease. Knowing the prevalence and distribution of oral mucosal pathologies, periodontal status etc., will be useful in this regard.[7]

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Oral health conditions constitute a major source of morbidity that affects the quality of life and general health conditions of the elderly. Oral health reflects overall well-being for the elderly population. Compromised oral health may be a risk factor for systemic diseases commonly occurring in old age. Conversely, elderly patients are more susceptible to oral conditions due to age-related systemic diseases and functional changes. Improving the oral health will significantly enhance the physical, social and mental attributes of geriatric individuals at home or workplace.1

In case of tribal communities in Kerala there is no reliable data on the oral health status of geriatric patients. Hence, the present study was undertaken with the objective of assessing the oral health status and treatment needs of tribal population.

Materials and Methods

Study setting
The cross-sectional study was carried out from September 2019 to February 2020 in Amrita Kripa hospital Kalpetta, Wayanad, Kerala India.

Study population
Tribal patients above the age of 60 years attending the health centre for routine dental/medical care. Chronically ill patients with restricted movements and subjects who do not give consent to the examination were excluded from the study.

Sample size
Based on prevalence of Periodontal disease (76.9%) observed in an earlier study (4), with 95% confidence interval and 5% absolute error, minimum sample size calculated using the formula $4pq/L^2$, was 275. In order to cover for the non-respondents, a total of 280 subjects were examined during the study.

Ethical clearance
Institutional ethical clearance was obtained from the ethical committee at Amrita Institute of Medical Science, Kochi. Informed consent was taken from each subject prior to recording oral health.

Oral health examinations and interview was conducted by a single examiner (SKN) who was calibrated and trained before and during the study. Intra-examiner calibration was estimated by examining 40 subjects followed by their re-examination a week later which resulted in 87% of diagnostic acceptability with a K value of 0.84.

Data collection methods
The purpose of the study was explained and written informed consent for participation (interview and dental examination) was obtained. The questionnaire in the local language Malayalam consisted of demographic, educational and family details, details of economic status, personal habits, general health and medical illness, oral health and dental illness, awareness on dental care etc.

The Oral Health Related Quality of Life (OHRQOL) was assessed by the Geriatric Oral Health Assessment Index (GOHAI-12).

The treatment needs were evaluated independently of the patient’s request based on his dental and prosthetic status, and according to the stated criteria. The “World Health Organization (WHO) oral health performa-2013” was used to record the clinical findings.8

WHO type III examination was carried out using mouth mirrors and CPI probes while using additional artificial light. Oral Health status was assessed for Periodontal Diseases by community periodontal index (CPI). The dental caries was assessed by DMF Index, Prosthetic status, Oral Mucosal Lesions and treatment needs was estimated.

Oral health related quality of life
General Oral Health Assessment Index [GOHAI]9,10 consists of 12 questions (Nine negative questions and three positive questions were asked to discourage respondent acquiescence). The 12 questions assess physical functions (eating, talking and swallowing) for items G1, G2, G3 and G4 and psychosocial aspects (self-esteem, social withdrawal and worries about oral health) for items G6, G7, G9, G10 and G11. Items G5, G8 and G12 assess symptoms (use of drugs to relieve pain, discomfort) related to the presence of dental diseases. There are five response categories for each question and a score has been assigned for each response category (i.e. 0 = never, 1 = seldom, 2 = sometimes, 3 = often, 4 = very often, 5 = always).

Before calculating the GOHAI score, the responses to nine items, (limit food due to dental problems, trouble biting and chewing, used medication, sensitive to temperature, nervous due to teeth, uncomfortable eating with people, prevented from speaking, worried about teeth, and limited contacts with people) have scoring reversed. This allows final high scores for the GOHAI to represent more positive oral health. For subjects with missing data, if 3 or more items are missing, the subject's data are not used. For subjects with one or two items with missing data, the item mean is substituted for the missing value.

Response codes are summed across the 12 statements to give a 0–60 overall score. The impact of oral disorders on health-related quality of life is calculated by assigning an overall score (which is ordinal or interval in nature) to indicate the extent of a range of functional and psycho-social consequences. The GOHAI score is the sum of the answers to the 12 questions so that a high score (Maximum = 60) means satisfactory oral health.

Statistical analysis
Completed data was processed using SPSS version 17 for statistical analysis. Bivariate analysis was done using Chi square test to assess the association between categorical variables. The
Results

Among 280 patients were included in the study, 70% were females (Out of 290 people approached, 10 people were not willing to participate in this study). Majority of the sample were 60-70 years old (86.42%, n = 242) and nearly 70% were illiterate. Socioeconomic status and type of house they were living (58.2% of population was having semipucca house) assessed. 72.9% of population were non-smokers but 69.3% were using chewing tobacco. 63.9% of population used tooth brush for cleaning teeth, 37.85% of population were undernourished. (n = 106).59.3% of population were unaware about oral health problems. The socio-demographic characteristics are shown in Table 1.

65.7% of subjects were free of dental caries (n = 184). Nearly 23.2% of population had periodontal pocket (> 5 mm) signifying the severe periodontal disease. Complete tooth loss observed in 42.9% Oral sub mucous fibrosis was prevalent in 35.7% of population. Almost 42% of subject needed some emergency treatments [Table 2].

Table 3 represents oral health quality of life assessed by GOHAI index responses and association of the same with age, gender and prosthetic status. Aging was significantly associated with poor OHRQoL. Female Gender, Edentulous patients were observed to have poor OHRQoL [Table 4]. Considering the Psychologic domain of GOHAI index, majority of population didn’t find oral heath as a barrier to quality of life.

Discussion

Facing the challenge of steady growth of the proportion of the elderly worldwide, the International Association of Gerontology singled out Gerodontology as a separate discipline in dentistry in 1983. The quality of life of elderly is dependent on good oral health which is integrally related to their general health. Kerala is witnessing due to demographic transition (aging) and the challenges that it presents in terms of ensuring their health and well-being. The tribal population has considerable health disparities despite government initiatives and the existing socioeconomic profile of the population is low compared to the mainstream population.

The comparison of the present study with other studies is difficult due to differences in the population type, selected age group and

| Table 1: Sociodemographic variables of study group |
|-----------------------------|-----------------|-----------------|
| Variables                   | Frequency       | Percentage      |
| Age                         |                 |                 |
| 60-70                       | 242             | 86.4            |
| >71                         | 38              | 13.6            |
| Mean 64.49&S.D 7.395        |                 |                 |
| Sex                         |                 |                 |
| Male                        | 66              | 23.6            |
| Female                      | 214             | 76.4            |
| Marital Status              |                 |                 |
| Married                     | 260             | 92.9            |
| Unmarried                   | 20              | 7.1             |
| Education                   |                 |                 |
| Illiterate                  | 198             | 70.7            |
| Primary school and above    | 82              | 29.3            |
| Occupation                  |                 |                 |
| Employed                    | 126             | 45              |
| Unemployed                  | 154             | 55              |
| Daily wage                  |                 |                 |
| <500                        | 270             | 96.4            |
| >500                        | 10              | 3.57            |
| Type of House               |                 |                 |
| Kutcha                      | 53              | 18.9            |
| Semipucca                   | 163             | 58.2            |
| Pucca                       | 64              | 22.9            |
| Family                      |                 |                 |
| Nuclear                     | 108             | 38.6            |
| Joint                       | 44              | 15.7            |
| Three Generations           | 128             | 45.7            |
| Smoking Habit               |                 |                 |
| Cigarette                   | 49              | 17.5            |
| Bid              | 27              | 9.6             |
| Non Smoker                  | 204             | 72.9            |
| Method for cleaning teeth   |                 |                 |
| Finger                      | 101             | 36.1            |
| Tooth Brush                 | 179             | 63.9            |
| Material for cleaning       |                 |                 |
| Tooth Paste                 | 168             | 60.0            |
| Tooth Powder                | 110             | 39.3            |
| Rice husk                   | 2               | 0.7             |
| Chewable tobacco            | 194             | 69.3            |
| No                          | 86              | 30.7            |
| Tongue Cleaning Aid         |                 |                 |
| Plastic tongue cleaner      | 17              | 6.1             |
| Steel tongue cleaner        | 5               | 1.8             |
| Coconut leaflet midrib      | 183             | 71.3            |
| Do not clean tongue         | 75              | 26.8            |
| BMI                         |                 |                 |
| <18.5                       | 106             | 37.85           |
| >18.5                       | 174             | 62.14           |
| Caries                      |                 |                 |
| No caries teeth             | 184             | 65.7            |
| Less than 2 teeth with caries | 10          | 3.6             |
| More than 2 teeth with caries | 86             | 30.7            |
| No. of teeth                |                 |                 |
| >20 teeth present           | 49              | 17.5            |
| Completely edentulous       | 120             | 42.9            |
| <20 teeth present           | 111             | 39.6            |
| Loss of Attachment          |                 |                 |
| Abundance of condition      | 82              | 29.3            |
| 4-5mm                       | 133             | 47.5            |
| >5mm                        | 65              | 23.2            |
| Oral Mucosal Lesions        |                 |                 |
| No abnormal condition       | 58              | 20.7            |
| Malignant tumor             | 10              | 3.6             |
| Leukoplaikia                | 4               | 1.4             |
| Lichen Planus               | 5               | 1.8             |
| Ulceration                  | 2               | 0.7             |
| Herpetic,Aphthous,Traumatic |                 |                 |
| Candidiasis                 | 89              | 31.8            |
| OSMF                        | 100             | 35.7            |
| Leukoplaikia and osmf       | 12              | 4.3             |
| Site                        |                 |                 |
| No lesion                   | 58              | 20.7            |
| Vermillion border           | 8               | 2.9             |
| Connioure                   | 3               | 1.1             |
| Lips                        | 8               | 2.9             |
| Subci                       | 2               | 0.7             |
| Buccal Mucosa               | 113             | 40.4            |
| Floor of mouth              | 3               | 1.1             |
| Tongue                      | 83              | 29.6            |
| Hard/Soft Palate            | 2               | 0.7             |
| Treatment needs             |                 |                 |
| Preventive or routine treatment needed | 94    | 33.6            |
| Poot treatment (including scaling) | 127     | 45.4            |
| Immediate (apert) treatment needed due to pain or infection of dental/oral origin | 55 | 19.6 |
| referred for comprehensive evaluation/Medical/dental treatment | 4 | 1.4 |
period during which studies were conducted. Statistics clearly show that.\(^4\)

There was a female preponderance in the study group, parallels with demographic picture of Kerala where female to male ratio is higher.\(^{11-15}\) Also that females may be easily available and have a positive health-seeking behaviour as compared to males.\(^{14}\)

The higher percentage of illiterate was observed in this study compared to other studies.\(^{16-18}\)

Tobacco cultivation is higher in Wayanad district and the family members of the study subjects are agricultural labourers in tobacco farms, that may explain higher percentage of the chewing tobacco, even among females in the study. Severe periodontal disease can be attributed to chewing tobacco among these subjects.\(^3\) The present study revealed a prevalence of 47.5% of loss of attachment of 4 mm‑5 mm which is much lower than showed by a study among the Iruliga tribes of India.\(^19\)

Inappropriate brushing technique and poor hygiene could explain the reasons for the deep periodontal pockets.

The Bhils, a tribal population of Rajasthan clean their teeth only with a mouthful of water.\(^20\) It is accepted that tooth brushing is the best way to maintain oral health. In contrast, the present study showed that a greater percentage of study population were using only finger for cleaning the teeth which led to poor oral hygiene.

Presence of higher proportion of the oral precancerous lesions like OSMF among the tribal population due to tobacco chewing habit.\(^21\) Also, majority of people found to have candidiasis on the dorsal surface of tongue.

There is a high score of missing teeth, as revealed from the studies in the review, which indicates that decayed teeth are generally extracted when pain or abscess develops and restorative procedures are rarely performed on the elderly population. This may be due to poor access to oral health care andinequalitiesinthedistribution of the oral care workforce and also due to unawareness. Indian average of DMFT value in the age group 65‑74 years was 11.\(^{19,22-25}\)

Higher proportion of tooth mortality indicates lack of accessibility, availability and affordability to dental health care facility.\(^26\) This also refers to huge health disparities in tribal population compared to the mainland people in Kerala.

Comparing the percentage distribution of the elderly subjects according to their responses to the individual questions in GOHAI between this study, it was found that the subjects in this study reported more problems in physical functioning and fewer problems in psychosocial functioning. This difference may be due to high prevalence of untreated dental problems among elderly patients so that they reported more problems in physical functioning. There was a significant difference in quality of life for old and very old population, as far as oral health status is considered. The results suggest that this group

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**Table 3: GOHAI items and responses**

| Quality of life (GOHAI) | Never (0) | Seldom (1) | Sometimes (2) | Often (3) | Very Often (4) | Always (5) |
|------------------------|-----------|------------|----------------|-----------|----------------|-------------|
| 1) Limit the kinds of food | 6 (2.1) | 163 (58.2) | 45 (16.1) | 21 (7.5) | 21 (7.5) | 24 (8.6) |
| 2) Trouble biting or Chewing | 6 (2.1) | 101 (36.1) | 111 (39.6) | 22 (7.9) | 16 (5.7) | 24 (8.6) |
| 3) Able to swallow Comfortably | 10 (3.6) | 136 (48.6) | 79 (28.2) | 35 (12.5) | 8 (2.9) | 12 (4.3) |
| 4) Problems to speak Clearly | 24 (8.6) | 107 (38.2) | 104 (37.1) | 35 (12.5) | 7 (2.5) | 3 (1.0) |
| 5) Able to eat any kind of food without discomfort | 7 (2.5) | 113 (40.4) | 111 (39.6) | 30 (10.7) | 15 (5.4) | 4 (1.4) |
| 6) Limit contact with People | 16 (5.7) | 117 (41.8) | 93 (33.2) | 43 (15.4) | 4 (1.4) | 7 (2.5) |
| 7) Pleased with look of Teeth | 13 (4.6) | 105 (37.5) | 102 (36.4) | 38 (13.6) | 5 (1.8) | 17 (6.1) |
| 8) Used medication to relieve pain | 5 (1.8) | 116 (41.4) | 101 (36.1) | 41 (17.1) | 8 (2.9) | 2 (0.7) |
| 9) Worried about teeth, gums or dentures | 9 (3.2) | 125 (44.6) | 104 (37.1) | 34 (12.1) | 5 (1.8) | 3 (1.1) |
| 10) Self-consciousness of teeth, gums or dentures | 8 (2.9) | 126 (45) | 104 (37.1) | 38 (13.6) | 2 (0.7) | 2 (0.7) |
| 11) Uncomfortable eating in front of others | 17 (6.1) | 124 (43.3) | 103 (36.8) | 34 (12.1) | 2 (0.7) | 0 (0) |
| 12) Sensitive to hot, cold or sweet foods | 18 (6.4) | 111 (39.6) | 99 (35.4) | 36 (12.9) | 16 (5.7) | 0 (0) |

**Table 4: Association of GOHAI and gender, age and prosthetic status**

| GOHAI Items | Male(N=66) | Female(N=214) | p value |
|-------------|------------|---------------|---------|
| Mean | Standard deviation | Mean | Standard deviation |
| Functional limitation | 7.36 | 1.679 | 4.86 | 1.960 | 0.000 |
| Pain and Discomfort | 5.90 | 2.058 | 5.14 | 1.820 | 0.004 |
| Psychological Impacts | 7.77 | 1.787 | 6.50 | 2.406 | 0.000 |
| Sensitivity | 4.92 | 1.986 | 3.168 | 1.397 | 0.000 |
| GOHAI Items | 26.44 | 19.72 | 5.487 | 0.000 |
| Functional limitation | 5.5 ± 2.20 | 5.12 ± 1.94 | 5 ± 2.36 | Not significant |
| Pain and Discomfort | 5.26 ± 1.84 | 5.34 ± 2.23 | 7.33 ± 1.50 | A and C(0.026) |
| Psychological Impacts | 6.73 ± 2.33 | 6.90 ± 2.33 | 9.1 ± 6.7 | Not significant |
| Behaviour Impacts | 3.59 ± 0.8 | 3.25 ± 1.81 | 4.83 ± 2.48 | Not significant |

There is a high score of missing teeth, as revealed from the studies in the review, which indicates that decayed teeth are generally extracted when pain or abscess develops and restorative procedures are rarely performed on the elderly population. This may be due to poor access to oral health care andinequalitiesinthedistribution of the oral care workforce and also due to unawareness. Indian average of DMFT value in the age group 65‑74 years was 11.\(^{19,22-25}\)

Unpaired t test done in Gender and GOHAI domains, NOVA, post-hoc Bonferroni test done in age and prosthetic status
Conclusion

The oral disease burden is very high in tribes. The prevalence of the tobacco habits is of concern. Oral diseases are associated with risk factors which are common to Non-Communicable Diseases like Diabetes Mellitus, Cardiovascular Diseases. There is bidirectional link between the diabetes and periodontal diseases. So, control and management of the oral diseases in geriatric is important way to achieved systemic health. Education and motivation of these laity is needed to improve their oral health. The results from this study form a baseline data for the health administrators for planning the suitable programmes for the betterment of oral health among the geriatric tribes of Kalpetta as well as across the Kerala state.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/ their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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