



Edentulousness, Denture Wear and Denture Needs of the Elderly in Rural South India

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(Received 22 Feb 2012; accepted 11 Jun 2012)

Abstract

Background: The objectives of this study were to evaluate the prevalence of edentulousness, patient's perception on dietary changes resulting from tooth loss and to identify the disparity between actual and patient perceived need to replace missing teeth in an elderly rural population in south India.

Methods: A cross sectional study using the systematic cluster sampling method was used to select the study sample of 150 elderly men and women. Data were collected using questionnaires and oral examination. The data were statistically analyzed using chi square test and pearson correlation.

Results: 15.6% of the rural elderly were completely edentulous and 54.7% were partially edentulous. Observed differences in distribution between the sampled elderly age groups were found to be statistically significant. Although 70.3% of the evaluated elderly actually required prosthodontic treatment, only 14.4% perceived the need to replace missing teeth. A small percentage of the elderly (18%) perceived a severe change in their diets due to tooth loss. Thirty three percent of them perceived a moderate change and 28% felt that there were no dietary changes because of tooth loss.

Conclusions: It is essential to identify feasible strategies to provide primary dental health education and treatment to all rural elderly in the future. We suggest community dental health services as a general health need of the elderly rather than a special health need of the community.

Keywords: Edentulousness, Denture Wear, Denture Need, India

Introduction

Teeth, be it natural or artificial are of paramount importance for human health (1). Various studies have shown that edentulousness, denture wear and denture needs are significantly correlated with sociodemographic variables (2) and diet (3). A study on the gender issues and oral health in the elderly found that elderly men had a higher percentage of filled teeth and denture wear compared to elderly women (4). There are several studies to prove that tooth loss affects dietary intake, mastication and the nutritional status of individuals (5). The level of edentulousness and denture

needs of the rural elderly are higher than those of the urban elderly (6).

This study aimed to evaluate the prevalence of edentulousness in an elderly rural population in Tamil Nadu, South India. The following were the objectives of this study:

- a) To evaluate the prevalence of edentulousness with respect to factors such as age and sex in an elderly rural population,
- b) To evaluate patient's perception on dietary changes resulting from tooth loss,

- c) To identify the disparity between actual and patient perceived need to replace missing teeth.

Materials and Methods

A community based epidemiological cross sectional study was carried out in the Thiruvallur district of Tamil Nadu, India, among a rural population of 82,702 pursuing agricultural and non-agricultural occupations. The systematic cluster sampling method (10 clusters of 15 elderly in each cluster) was used to select the study sample of 150 elderly men and women (in equal proportion). Questionnaires following the WHO criteria and a mini nutritional assessment form were used to collect the required data from the 150 participants. Oral examination was completed in 128 of the participants. The collected data were entered on a PC and analyzed using a standard SPSS® statistical program version 11, software (SPSS Inc Chicago Illinois, USA). Descriptive statistics were applied and Pearson Chi-square test was used to test variables. The level of statistical significance was set to 95%.

Results

1. According to our study, 15.6% of the rural elderly were completely edentulous and 54.7% were partially edentulous.
2. Gender was not found to be significantly associated with edentulousness, while the observed differences in distribution between the sampled elderly age groups was found to be statistically significant ($P < .05$).
3. Although 70.3% of the evaluated elderly actually required prosthodontic treatment, only 14.4% perceived the need to replace missing teeth.
4. A small percentage of the elderly (18%) perceived a severe change in their diets due to tooth loss. Thirty-three percent of them perceived a moderate change and 28% felt that there were no dietary changes because of tooth loss.

Discussion

Age wise distribution of edentulousness is given in Table 1. Sixteen percent of the evaluated elderly were completely edentulous. A significant proportion (27.9%) of the evaluated elderly in the 70-79 age groups was completely edentulous. This estimate was higher than the WHO national estimate of 19% (7) in this age group.

Table 1: Distribution of edentulousness among the rural elderly according to age

Age (Yr)	Completely edentulous	Partially edentulous	All teeth present	Total
60-70	12 13.5%	50 56.2%	27 30.3%	89 100.0%
>70	8 20.5%	20 51.3%	11 28.2%	39 100.0%
Total	20 15.6%	70 54.7%	38 29.7%	128 100.0%

The proportion of elderly who were partially edentulous was 64.8%. This proportion increased with age. It was 59.7% in the 60-69 yr age group and 83.7% in the 70-79 age group. The observed difference in partial edentulousness was significantly different between the age groups. This observation that edentulousness increases with age is in agreement with the finding of other studies (8,9).

The gender wise distribution of edentulousness is given in Table 2.

Table 2: Distribution of edentulousness among the rural elderly according to gender

Gender	Completely edentulous	Partially edentulous	All teeth present	Total
Male	12 19.0%	34 54.0%	17 27.0%	63 100%
Female	8 12.3%	36 55.4%	21 32.3%	65 100.0%
Total	20 15.6%	70 54.7%	38 29.7%	128 100.0%

The gender distribution of complete edentulousness was 19.4% in males and 12.5% in females. Approximately 70% in each sex were partially edentulous. These differences were not statistically significant.

Regarding the perceived need to replace missing teeth among the study participants with tooth loss, only 14.4% of them felt the need to replace missing teeth while 70.3% actually required prostodontic treatment. This observation can be associated with the fact that dental surgeons are not posted at the level of primary health center in most rural areas of India. Provision of dental care in rural areas should not be limited to treatment alone but should focus on empowering the community through dental health education to increase acceptability of services leading to greater utilization of curative care (10).

It was surprising to note that only 2 elderly women used prosthetic appliances. They had used these removable appliances for the past 3 years and had no difficulty in speaking, chewing, or swallowing. Another elderly woman had used a removable prosthesis 6 months ago, but had discontinued its use thereafter because of difficulty in speaking, chewing, swallowing, and a lack of confidence to use it in public. In a similar study of the elderly in Denmark (11), it was documented that 66% of the population was edentulous of which 14% reported wearing denture in one arch and 74% in both arches. Another study among 537 elderly in Hong Kong found that 12% of the subjects were completely edentulous (12). Their study found that 29% of the elderly had no prosthesis, 52% had a denture or dentures, 33% had a bridge or bridges, and 13% had both.

A small percentage of the elderly (18%) perceived a severe change in their diet pattern due to tooth loss. Thirty three percent of them perceived a moderate change and 28% felt that there were no dietary changes because of edentulousness. It was interesting to note that nearly 93% of the study participants have a carbohydrate rich meal at least twice a day. This was consistent with the results that, 95% of them had taken 6- 9 meals over the past 3 days. The proportion of the elderly taking the recommended amount of whole grains was

10% and 39% did not include whole grains in their diet. A majority of the rural elderly (68%) have less than one serving of vegetables in a day. Twenty one percent of the study participants consume fruits, less than once a month. Diet and consequent nutrient intake affects the oral and systemic health of the individual. The high unmet and unperceived need observed in the study may negatively influence the quality of life (13). Inability to consume the adequate nutrients will gradually decrease the quality of life especially among the elderly.

In conclusion, according to our study, the prevalence of edentulousness was very high among the rural elderly. The condition was significantly associated with the age but not the sex of the individual. It was surprising to observe a very low perceived unmet denture need and denture use among the rural elderly. It is essential to identify feasible strategies to provide primary dental health education and treatment to all rural elderly in the future. Incorporating primary as well as rehabilitative dental care services under the existing rural health infrastructure may be an effective method to improve access to oral health care for the elderly in developing countries.

Ethical considerations

Ethical issues (Including plagiarism, Informed Consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy, etc) have been completely observed by the authors.

Acknowledgements

The authors wish to acknowledge Dr. Santosh, Consultant periodontist, Sundaram Medical Foundation, Chennai, for his help in the acquisition of data. The authors declare that there is no conflict of interests.

References

1. Yu KT, Mark SG (2005). Commentary: Is tooth loss good or bad for general health? *Int J Epidemiol*, 34: 475-476.

2. Preoteasa E, Băncescu G, Lonescu E, Băncescu A, Donciu D (2004). Epidemiologic aspects of the totally edentulous mouth - General aspects. *Bacteriol Virusol Parazitol Epidemiol*, 49: 115-20.
3. Joshipura KJ, Willett WC and Douglass CW (1996). The impact of edentulousness on food and nutrient intake. *J Am Dent Assoc*, 127: 459-467.
4. Shah N (2003). Gender issues and oral health in elderly Indians. *Int Dent J*, 53: 475-84.
5. Geissler CA, Bates JF (1984). The nutritional effects of tooth loss. *Am J Clin Nutr*, 39: 478-489.
6. Shah N, Parkash H, Sunderam KR (2004). Edentulousness, denture wear and denture needs of Indian elderly – a community-based study. *J Oral Rehab*, 31: 467–476.
7. WHO. The world oral health report 2003. Available from <http://www.who.international/oralhealth/publications/report03/en/prInternational.html>
8. Shetty P, Bhargava K, Goel P, Saha R (2001). Edentulousness and prosthetic needs of a rural population in southern India. *J Indian Prosthodont Soc*, 1: 20-25.
9. Angelillo IF, Saggiocco G, Hendricks SJH, Villari P (1990). Tooth loss and Dental caries in institutionalized elderly in Italy. *Comm Dent Oral Epidemiol*, 18: 216-218.
10. Pankaj G, Kanwarjit S, Arundeeep K, Mahesh V (2006). Oral healthcare for elderly: Identifying the needs and feasible strategies for service provision. *Indian J Dent Res*, 17: 11-21.
11. Christensen J (1977). Oral health status of 65 to 75 year old Danes: A preliminary report of the replication of W.H.O.'s international collaborative study in Demnark. *J Dent Res*, 56: 149-C153.
12. Corbet EF, Lo ECM (1994). Tooth spaces in and prosthetic treatment received by the middle-aged and the elderly in the Hong Kong. *Comm Dent Oral Epidemio*, 22: 386-91.
13. Anneloes EG, Finbarr A, Dick JW, Ewald MB and Nico HJC (2010). Tooth loss and oral health-related quality of life: a systematic review and meta-analysis. *Health and Quality of Life Outcomes*, 8: 126.