

PROSTHETIC STATUS AND PROSTHETIC NEEDS AMONGST GERIATRIC FISHERMEN POPULATION OF KUTCH COAST, GUJARAT, INDIA

Dola Rama Venkata Kumar^{1*}, Datla Srinivasa Raju², Lakshmu Naidu³, Sumit Deshpande⁴,
Manish Chadha⁵, Abhinav Agarwal⁶

¹Department of Prosthodontics, Pacific Dental College and Hospital, Debari, Udaipur, India

²Department of Prosthodontics, Vishnu Dental College, Bhimavaram, India

³Department of Prosthodontics, ANIDS, Vishakapatnam, India

⁴Department of Prosthodontics, PDU Dental College, Solapur, India

⁵Department of Prosthodontics, Pacific Dental College and Hospital, Debari, Udaipur, India

⁶Department of Prosthodontics, KD Dental College and Hospital, Mathura, India

ABSTRACT

Background. Literature among fishermen of India is scanty. The external factors like diet, quality of dental hygiene and environmental factors have an effect on oral health. Moreover elderly age group offer very little importance towards their oral health.

Objective. To assess the prosthetic status and prosthetic treatment needs among the geriatric fishermen population of Kutch coast, Gujarat, India.

Material and Methods. A cross sectional descriptive study was conducted among 1200 elderly people (above 60 years) of Kutch coast, Gujarat, India. They were interviewed and examined using a proforma designed with the help of WHO Oral Health Survey 1997. *Chi square* test was used for comparisons. Confidence level and p-value were set at 95% and 5% respectively.

Results. Out of 1200 elderly people, 836 were males and 364 were females. Considering the prosthetic status, majority (76.7%) had no prosthesis followed by full removable dentures (12.3%). An insight into the prosthetic needs showed that majority (27.3%) had a need for multiunit prosthesis.

Conclusion. In this study, it was seen that overall prosthetic status was low and prosthetic need was high. Therefore new avenues have to be discovered to make the prosthetic treatment readily available to the elderly.

Key words: geriatrics, occupational, India

INTRODUCTION

Ageing can best be viewed as a bio-psychosocial process in which changes occur at various levels in all three components of the bio-psychosocial system [3]. The elderly have constantly been a precious reservoir of wisdom and guidance to the upcoming youth in our community and thus play a major role in shaping the fate of future generations. A 'senior citizen' or 'elderly' is defined as a person who is of age 60 years or above (according to the 'National Policy on Older Persons' that was adopted by the government of India in January, 1999) [15].

India has a population of 1.27 billion (according to census 2011), out of which almost 77 million comprise the age band of 60 years and above [15], which can be referred to as the "Geriatric" population. The geriatric

population of India (people above the age of 60 years) at present is 7.7% and is expected to rise to 8.9% in 2016, to 21% by 2050 [12-14]. With such a large proportion of people in the elderly age group, it is imperative to consider and cater to the diseases and their treatment needs that this group presents. Senile changes in not only the soft tissues, but the hard tissues too, invite with them an array of diseases that the elderly are more prone to suffer from. Studies have shown that tooth loss in very old subjects (> 80 years) can have a significant impact not only on chewing abilities but also on general physical abilities [9]. These diseases may stem from a pre-existing medical/dental condition that the person might be suffering from, or an environmentally acquired effect on the health of the person. Moreover, the effect of occupation in which they were involved in for major part of their lives may have cumulative impacts on their

*Corresponding author: Dola R.V. Kumar, Department of Prosthodontics, Pacific Dental College and Hospital, Debari, Airport Road, Udaipur, Rajasthan, India, e mail: drv Kumarprostho@gmail.com

health and oral health in old age. The example of one such occupation is fishing. Prolonged working hours of fishermen diminish their priority towards health and oral health. Also their lower socioeconomic strata leave them with extractions as their sole treatment option during earlier ages.

Hence, this study was undertaken in attempt to assess the prosthetic status and prosthetic treatment need among the geriatric fishermen population of Kutch coast, Gujarat, India.

MATERIAL AND METHODS

Study design, population and duration

A descriptive cross-sectional survey was conducted to assess the prosthetic status and prosthetic treatment needs among the 1200 elderly, above 60 years old (Table 1) fishermen of Kutch District, Gujarat, India, from March 2014 to May 2014.

Official permission and ethical clearance

The study protocol was reviewed by the Ethical Committee of Pacific Dental College and Hospital and the ethical clearance was granted. An official permission was obtained from the Chairman of Fisherfolk community of Kutch District, Gujarat, India.

Informed consent

After explaining the purpose and details of the study, a written informed consent was obtained from all the subjects who were willing to participate.

Training and calibration

All the examinations were carried out by a single qualified examiner. Training sessions and calibration of examiner were conducted by the two senior faculty members until an acceptable level of consistency in diagnosis was reached. The intra-examiner reliability was assessed using Kappa statistics, which was found to be 98%.

Inclusion criteria

1. Subjects who were willing to participate and provided informed consent.
2. Patients aged 60 years and above.
3. Teeth that were not salvageable and indicated for extraction due to dental caries or periodontal diseases or any other factor were considered as missing teeth and included under prosthetic need.

Exclusion criteria

1. Subjects who were not willing to participate.
2. Third molars and supernumerary teeth were not included in the study.
3. Subjects who were not able to open mouth or pa-

tients with neurological impairment and debilitating diseases.

Pilot survey

A pilot study was carried out among 50 fishermen subjects to determine the feasibility and practicability of the study and the time required for examination of each subject. It helped to know the practical difficulties while conducting the survey. It took around 10 min to assess each subject. The prevalence of prosthetic treatment need was found to be 60%.

Sample size calculation

Depending on the prevalence of oral mucosal lesions obtained (60%), 95% confidence level and 5% allowable error, the minimum sample size was determined to be 1066 which was rounded off to 1200.

Sampling design

The principal unit of administration in India is the district under a Collector. Most districts are divided into two or more subdivisions. Each subdivision is again divided into Tehsils. Each Tehsil comprises of several villages.

Multistage random sampling was employed to select the study population. Kutch coast is divided into four zones from which one zone (Anjar, Mundra) was randomly selected. From the selected zone, a taluka (Mundra) was randomly selected. From the selected taluka, 2 villages (Bhadreshwar and Luni) were randomly selected. Subjects aged 60 years and above were randomly selected starting from the reference point.

Proforma details and clinical examination

The Proforma consisted of information on prosthetic status and prosthetic treatment need according to WHO Oral Health Survey (1997) [18]. A portable dental chair and light were used to facilitate outreach examinations and field work.

Statistical analysis

The recorded data was compiled and entered in a spreadsheet computer program (Microsoft Excel 2007) and then exported to data editor page of SPSS version 11.5 (SPSS Inc., Chicago, Illinois, USA). *Chi* square test was used for comparisons. Confidence level and p-value were set at 95% and 5% respectively.

RESULTS

The study population comprised of 1200 elderly fishermen subjects. Of these, 836 (69.6%) were males and 364 (30.3%) were females. Majority (68.5%) of them were in the age group of 60-69 years (Table 1).

Table 1. Distribution of study population according to age and gender

| Variables | Number (n) | Percentage (%) |
|-------------------|------------|----------------|
| Age group (Years) | | |
| 60-69 | 823 | 68.5 |
| 70-79 | 319 | 26.5 |
| ≥ 80 | 58 | 4.8 |
| Gender | | |
| Male | 836 | 69.6 |
| Female | 364 | 30.3 |
| Total | 1200 | 100 |

Considering the prosthetic status, in total, majority of them had no prosthesis (76.7%) followed by full removable dentures (12.3%), bridge (5.5%), partial denture (3.3%), more than one bridge (2.1%) and both bridge(s) and partial dentures (0.3%). Prevalence of bridge (7.7%) was observed to be highest among 60-69 years age group and that of full removable denture (12.7%) among >80 years age group. Age differences were statistically significant. Males showed significantly greater prevalence of prosthesis as compared to females (Table 2).

An insight into the prosthetic needs showed that majority of the study population need multi-unit prosthesis (27.3%) followed by full prosthesis (23.6%), one

unit prosthesis (10.5%), and combination of one and/or a multiunit prosthesis (3.8%). The need for multi-unit prosthesis and need for full unit prosthesis was significantly higher in females than males. The prosthetic need increased as age advanced (Table 3).

DISCUSSION

For the present epidemiological study, of the 1200 fishermen subjects examined, 836 (69.6%) were males and 364 (30.3%) were females. As per the classification of age groups, it was found that 68.5% of the residents were in the 60-69 years age group, 26.5% of them were in the 70-79 years and 4.8% of them were in the 80 years plus age group.

To the best of our knowledge, no studies had been conducted regarding the prosthetic status and prosthetic needs among fishermen community.

In the present study, when the prosthetic status was assessed, it was observed that only 12.3% of study subjects possessed full dentures. This finding is in conformity with the study conducted by National oral health survey and fluoride mapping 2002-2003, Rajasthan state [1]; *Shah et al.* [14] and *Goel et al.* [4] among Indian populations. The figures are very low

Table 2. Prosthetic status of study population according to age and gender

| Variables | No prosthesis n (%) | Bridge n (%) | More than one bridge n (%) | Partial denture n (%) | Both bridge and partial denture n (%) | Full removable denture n (%) | p- value |
|--------------------|---------------------|--------------|----------------------------|-----------------------|---------------------------------------|------------------------------|----------|
| Age groups (years) | | | | | | | |
| 60-69 (n=823) | 636 (77.3) | 63 (7.7) | 16 (1.9) | 24 (2.9) | 03 (0.4) | 81 (9.8) | 0.032* |
| 70-79 (n=319) | 238 (74.6) | 03 (0.9) | 09 (2.8) | 15 (4.7) | 0 | 54 (16.9) | |
| ≥ 80 (n=58) | 46 (79.3) | 0 | 0 | 0 | 0 | 12 (20.7) | |
| Gender | | | | | | | |
| Male (n=836) | 629 (75.2) | 51 (6.1) | 09 (1.1) | 33 (3.9) | 3 (0.4) | 111 (13.3) | 0.021* |
| Female (n=364) | 291 (79.2) | 15 (4.1) | 16 (4.4) | 06 (1.6) | 0 | 36 (9.9) | |
| Total (n=1200) | 920 (76.7) | 66 (5.5) | 25 (2.1) | 39 (3.3) | 03 (0.3) | 147 (12.3) | |

Test applied: *Chi-square* test, *statistically significant

Table 3. Prosthetic need of study population according to age and gender

| Variables | No prosthesis needed n (%) | Need for one unit prosthesis n (%) | Need for multi-unit prosthesis n (%) | Need for a combination of one and/or multi-unit prosthesis n (%) | Need for full prosthesis n (%) | p- value |
|--------------------|----------------------------|------------------------------------|--------------------------------------|--|--------------------------------|----------|
| Age groups (Years) | | | | | | |
| 60-69 (n=823) | 303 (36.8) | 90 (10.9) | 237 (28.8) | 34 (4.1) | 159 (19.3) | 0.041* |
| 70-79 (n=319) | 99 (31) | 27 (8.5) | 79 (24.8) | 09 (2.8) | 105 (32.9) | |
| ≥ 80 (n=58) | 15 (25.9) | 09 (15.5) | 12 (20.7) | 03 (5.2) | 19 (32.8) | |
| Gender | | | | | | |
| Male (n=836) | 325 (38.9) | 96 (11.5) | 226 (27) | 28 (3.3) | 161 (19.3) | 0.011* |
| Female (n=364) | 92 (25.3) | 30 (8.2) | 102 (28) | 18 (4.9) | 122 (33.5) | |
| Total (n=1200) | 417 (34.8) | 126 (10.5) | 328 (27.3) | 46 (3.8) | 283 (23.6) | |

Test applied: *Chi-square* test, *statistically significant

when compared to study conducted by *Henrikersen* et al. in Norway [6], *Carter* et al. in New Zealand [2] and *Unluer* et al. in Turkey [17]. The present study has shown low percentage of subjects wearing complete or partial denture. The reasons might be due to general attitude and behaviour towards the dental care and characteristics of the health care system [9]. This can also be attributed to the reason that elderly people have their fear of not being able to adapt to denture use. Moreover elderly persons are more negatively inclined towards wearing of complete/ partial dentures than younger persons. Elderly and especially their family members do not think that dentures are important. They already incur expenses on medical treatment for other illness and therefore are reluctant to spend further on dentures. To those who have a accessibility to dental surgeons, the making of removable dentures by the dental surgeons, the cost involved and the comforts levels of those removable dentures, also play an important role in the decision making for Prosthodontic treatment. In agreement with the results of studies conducted by *Makila* [7] and *Ranta* et al. [11] in Finland, the percentage of fixed prosthesis use was low (7.6%) in present study. The reason for the low percentage of use of fixed prosthesis might be due to the high cost attainment and unawareness about fixed partial dentures.

In the present study, when the prosthetic treatment need was analysed, it was found that totally 65.2% of subjects require some or the other form of prosthetic treatment. In this, 23.6% require complete dentures and 41.6% required partial dentures. These findings are supported by the results of earlier research conducted by *Grabowski* et al. in Denmark [5], *Smith* et al. in Nottingham, UK [16] and *Prasad* et al. in India [10]. Such a high percentage of prosthetic need might be due to problems related to decrease in physical mobility, dependency on help and general tiredness that make difficult to visits a dental clinic or limit the utilization of dental services [8]. This can also be attributed to their lifestyle, family background, education, awareness about the importance of oral health and replacement of missing teeth and social cultural practices. Prolonged working hours of fishermen may also be responsible for their neglect related to oral health.

While estimating the denture treatment needs, it was observed in our study that there was a statistical difference between denture need for males and females ($p < 0.05$). Both partial and complete denture need was found to be higher in females than in males. Moreover, older age group showed greater needs than their young counterparts. The possible reason for age difference may be that older people suffer more from various diseases that also affect oral health. The reason may be social too, as oral health is less valued by older persons.

The estimation of treatment needs is an important stage in oral health care planning for the elderly. The first step in planning oral health services is therefore the assembly of up to date information on the prevalence and incidence of oral diseases in a given population. With this information, it is possible to assess future treatment needs and demands for the service. Also new avenues have to be discovered to make the prosthetic treatment readily available to the elderly at a reasonable cost and at the same time make them aware of the importance of replacement of missing teeth which could significantly improve their quality of life.

CONCLUSION

In this study, it was seen that prosthetic status among fishermen of Kutch coast, Gujarat was low and prosthetic need was high. Effective steps need to be taken by the government to prevent loss of teeth and make provisions to overcome the barriers for meeting the unmet dental needs of the geriatric fishermen population. To meet the challenge of high need for prosthetic services in the elderly population, a change in value system, delivery system, health care providers behaviors and individual's appreciation of teeth is needed. For this we need to provide sensitive oral health services that are accessible, appropriate and acceptable to them. So a comprehensive strategy needs to be evolved and implemented.

Conflict of interest

The authors declare no conflict of interest.

REFERENCES

1. *Bali R.K., Mathur V.B., Talwar P.P., Chanana H.B*: National Oral Health Survey and Fluoride Mapping 2002-2003, Rajasthan. Dental Council of India. Ministry of Health and Family Welfare (Government of India), 2004.
2. *Carter G., Lee M., Mckelvey V., Sourial A., Halliwell R., Livingston M*: Oral health status and oral treatment needs of dependent elderly people in Christchurch. *N Z Med J* 2004; 21;117(1194):U892.
3. *Gluck G.M., Morganstein W.M*: *Jong's Community Dental Health*. 5th ed. Missouri, Mosby Publishers, 2003.
4. *Goel P., Singh K., Kaur A., Verma M*: Oral healthcare for elderly: Identifying the needs and feasible strategies for service provision. *Indian J Dent Res* 2006; 17(1):11-21.
5. *Grabowski M., Bertram U*: Oral health status and need of dental treatment in the elderly Danish population. *Community Dent Oral Epidemiol* 1975; 3:108-114.
6. *Henriksen B.M., Ambjornsen E., Lake K., Axell T*: Prevalence of teeth and dentures among elderly in Norway receiving social care. *Acta Odontol Scand* 2003; 61: 184-191.

7. *Makila E*: Oral health among the inmates of old people's homes VI. Need for treatment. *Proc Finn Dent Soc* 1979; 75:1-5.
8. *Marcus P.A., Joshi A., Jones J.A., Morgano S.M.*: Complete edentulism and denture use for elders in New England. *Journal of Prosthetic Dentistry* 1996, 76:260-6.
9. *Petersen P.E., Yamamoto T.*: Improving the oral health of older people: the approach of the WHO global oral health programme. *Community Dent Oral Epidemiol* 2005, 33(2):81-92.
10. *Prasad K.V.V, Thanveer K., Javali S.B.*: Denture status and needs of prosthetic treatments in the elderly population of Dhadwad District, Karnataka state. *Journal of Indian Dental Association* 2001; 72.
11. *Ranta K., Paunio I., Vehkalahti M.*: Prosthetic rehabilitation of 342 edentulous adult. *Gerodontology* 1985; 1:244-6.
12. *Shah N*: Challenges for geriatric oral health care in India. *Developing Dentistry* 2004; 5(2):20-27.
13. *Shah N*: Oral health care system for elderly in India. *Geriatrics and Gerodontology International* 2004;4: S162-S164.
14. *Shah N., Prakash H., Sundram KR*: Edentulousness, denture wear and denture needs of Indian elderly – a community based study. *J Oral Rehab* 2004; 31: 467-476.
15. *Situation Analysis of the Elderly in India*, June 2011, Central Statistics Office, Ministry of Statistics & Programme Implementation, Government of India.
16. *Smith J.M., Sheiham A*: Dental treatment needs and demands of an elderly population in England. *Community Dent Oral Epidemiol* 1980; 8:360-364.
17. *Unluer S., Gokalp S., Dogan B.G.*: Oral health status of the elderly in a residential home in Turkey. *Gerodontology*; 2007;24:22-29.
18. *World Health Organization*. Oral Health Surveys. Basic methods. 4th edition, WHO, Geneva 1997.

Received: 19.11.2014

Accepted: 12.03.2015

