

A Review on Prevalence of Edentulism and its effects on General and Oral health in India

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Abstract

Introduction: This review is aimed at studying the Prevalence of Edentulism in India and effects of Edentulism on general and oral health.

Materials and Methodology: Electronic databases were searched without limits for this review (Pubmed, Google, Medline). Studies that addressed Prevalence of Edentulism in India and its effects on general and oral health were analysed and reviewed. In addition, a manual search was done to search the missed articles during electronic search.

Results: 5 review articles which best reflects the Edentulism prevalence and the relation between oral and general health were included for writing this review article. Two articles were pertaining to prevalence of edentulism in India and three articles were on effects on oral health and two articles on general and oral health were analysed.

Conclusion: Edentulousness is found to be a serious debilitating condition which causes various deleterious ill effects in the general and oral health. The oral effects of Edentulism are residual ridge resorption, poor masticatory functions, diet modification leading to

impaired health, social disability, oral lesions due to improper maintenance of oral cavity. The general health problems are increased risk of coronary heart and peripheral vascular disease, hypertension and various systemic diseases leading to increased mortality rate.

Keywords: Prevalence, Edentulism, India, Effects on General health, Oral health.

Introduction

Tooth/teeth loss, an inseparable basic factor leading to edentulousness, is a multifactorial terminal event in the life of tooth/teeth.

India is found to be the second most populous country in the world, with over 1.21 billion people (2011 census), more than one sixth of the world's population. Already contributing to about 17.5% of the world's population, India is projected to be the world's first populous country by 2025, surpassing China, its population reaching 1.6 billion by 2050. India's population is likely to be increased by 60 per cent between 2000 and 2050, simultaneously the number of elders, who have attained 60 years of age,

will shoot up by 360 per cent ^[1]. The UN estimates that by 2050, the world's older population - which is defined as those over age 60 - will increase from the current 800 million to over two billion. Currently, Japan is the only country that has an older population of more than 30 percent. By 2050, 64 countries are expected to have the same ratios. Worldwide, people aged 60 and over will outnumber those aged 15 and below ^[2]. Thus the need of oral health care for the elderly increases proportionately with the population growth.

Different studies have given a wide range prevalence of edentulism in India in different age groups varying from 5.6% in 6 yr old children to 91.2% in elderly over age of 65^[3-10]. Prevalence of tooth loss among general population over 15 years was 38.2% to 62% with prevalence of completely edentulousness with range of 1% to 2.5%. Prevalence of edentulousness in elderly was found in range of 70.3% to 91.2% however completely edentulousness was ranging from 14.2% to 35.4%.

The following are the causative factors for dental caries and periodontal problems leading to edentulousness. Poor oral hygiene, poor nutrition, adverse oral habits (eg. Bruxism, crossbite), degenerative systemic disease, unfavourable medication (Anticholinergic, sympathomimetic drugs causing xerostomia), Abnormal orodentofacial anatomy.

Definition

Edentulism is a debilitating and irreversible condition and is described as the final marker of disease burden of oral health.^[11]

Edentulism is defined as loss of all permanent teeth^[12] and is the terminal outcome of a multifactorial process involving biological process [caries, periodontal disease, pulpal pathology, trauma, oral cancer] as well

as nonbiologic factors related to dental procedures (access to care, patient preferences, third party payments for selected procedures, treatment options, etc).

Materials And Methodology

A systematic computerized search of electronic databases was done in PubMed, Medline, Google and Scopus from June 1998 to August 2009. The following search strategy was used in PubMed. ((Edentulism) AND (Prevalence in India) AND (effects on oral health) AND (General health)). Similar search was also made in Medline and Scopus. Full text articles were obtained from the abstracts that met the initial selection criteria. Furthermore, a secondary manual search was then performed by going through the reference lists of the selected articles to identify articles that met the initial inclusion criteria that was missed by electronic search.

60 articles were found and only 15 were in the inclusion criteria out of which 3 articles were about prevalence of edentulism in India, 9 articles were about the effects on oral health and 5 on effects of edentulism on oral and general health.

Prevalence of edentulism in various places of India are illustrated in Table 1.

Discussion

Effects on oral health

Chronic diseases such as dental caries and periodontal problems are still highly prevalent in older adults and the risk of tooth loss among elderly is high. Bone loss is an ongoing process following loss of tooth/teeth^[13] affecting the maxilla four times that of mandible ^[14]. The duration of edentulism is found to be strongly associated with the level of bone residual ridge resorption ^[15].

Mastication is one of the major functions performed by the teeth that is used to crush and chew the food. Oral function and oral health status are majorly associated with number of teeth present [15,16]. Denture wearers exhibit compromised chewing cycles, biting force and muscle activity. The mechanism of mastication differs significantly among denture wearers. They need 7 times more chewing strokes to cut the food into half its original size compared to natural dentition [17]. This alteration in chewing functions leads to structural changes in the chewing muscles. Also, the efficiency of chewing among denture wearers is limited because of the denture's physical retention, stability and pain in the denture bearing tissues. It is difficult to stabilise the lower denture compared to upper during function. Thus people with denture are compromised to consume soft diet due to limitations to chew and grind the food. People with natural dentition have four to five times more bite strength and masticatory forces when compared to complete denture wearers [18]. Denture wearer requires modification of food substances because of reduced chewing efficiency and are not able to bite, chew and swallow compared to dentate patients [19,20]. Due to the inability of proper food intake, edentulous patients are more prone to malnutrition and general health is affected. Wound healing is also found to be affected. Edentulous patients are more often found to have decreased tissue regeneration and decreased tissue resistance [21]. Edentulism is also found to be associated with deficiency in the functional and sensory part of the oral mucosa, oral musculature and salivary glands.

Oral dyskinesia is a condition associated with involuntary, abnormal, stereotyped or patterned and is not much purpose kind of orofacial movement. It is

important to note in edentulous patients. Various factors such as unstable or ill fitting dentures, discomfort in the oral structures and lack of sensory contacts have been given to explain this condition whereas the actual mechanism is still not known. It is also found that patients with oral dyskinesia experience discomfort with the dentures leading to damage of soft and hard tissue structures [22].

The following are some of the oral lesions or disorders associated with denture usage and age quoted in studies [23,24,25].

- Angular cheilitis
- Oral Candidiasis
- Traumatic ulcers
- Denture stomatitis
- Hyperplasia

These lesions rarely goes into malignant transformation, whereas mostly it is found to be benign if the oral mucosa and tissues are in protective function [24].

Effects on general health

General health of a person is found to be affected more with edentulousness due to the lack and inability of the person to consume proper food and nutrition. Various studies have been quoted about the effects on general health due to edentulousness. The following are the important ill effects caused due to edentulousness.

Studies say that Edentulism is associated with Obstructive sleep apnoea [25] which gets worsened for denture wearers on removal of dentures due to decrease in the anteroposterior oropharyngeal wall distance [26,27,28]. The relationship between Edentulism and obstructive sleep apnoea have mechanical effects due to loss of Occlusal support when the dentures are missing and there is no contact.

Diabetes is found to be one of the major disease seen commonly in elderly people. Studies have shown that edentulous people are at a high risk of Type II Diabetes mellitus^[29] (Non insulin dependent). There are evidence based studies that shows diabetes has a direct relationship with periodontal disease^[30]. Periodontal diseases invariably leads to bone loss and finally loss of teeth. It is also found to be associated with several Gastrointestinal disorders and occurrence of peptic and duodenal ulcers and pancreatic cancer^[31,32,33]. Studies have been quoted that it may cause physical disability, mental impairment^[34] which leads to a relationship between Edentulism and morbidity.

It is associated with elevated levels of systemic C-reactive protein which was found in edentulous patients, possibly due to chronic infections in the oral mucosa comparable to an increased systemic inflammatory response in patients with periodontal diseases^[35,36]. Increased concentration in the C-Reactive protein in edentulous patients indicates underlying proinflammatory trait that leads to periodontitis and Congenital heart diseases which are found to be the risk factors for cardiovascular diseases. There are studies which says it is also associated with Alzheimer's disease^[37,38,39] wherein longitudinal studies could not confirm this association^[40]. This is due to the reduced intake of less nutritious diet. Edentulism is found to affect the bone mineral density by decreasing it's level which was found to be characteristic of osteoporosis and tooth loss^[41]. Tooth loss is mainly due to gradual loss of bone around the teeth which in turn is due to reduced bone mineral density.

Increased risk of Vascular related conditions such as coronary Heart disease^[42], peripheral arterial disease^[43]

and cerebral vascular disease^[44] is found to be associated with periodontal disease and tooth loss. Smoking is considered to be one of the major reasons associated with systemic as well as oral conditions such as peripheral vascular disease, respiratory disease, lung disorders and chronic periodontal disease which eventually leads to tooth/teeth loss^[45].

TABLE 01: Prevalence of Edentulism in various areas of INDIA

Author's name and year	Place	Study design	Sample size	Study results (> 60 years)	
				Prevalence of partially edentulous	Prevalence of Completely edentulous
Padma ariga et al, 2012 ^[3]	Thiruvallur, Tamilnadu.	Cross sectional Study	150	70.3%	15.6%
Shah N et al. 2004 ^[7]	Delhi	Cross sectional Study	1240	82.5%	15.2%
V Patil et al, 2012	Delgaum workers	Cross sectional Study	654	38.2%	1%
Reddy NS et al, 2012 ^[34]	Kadapa rural area	Cross sectional Study	500	62%	nil
Bijjargi et al. 2012	Gulberga	Cross sectional Study	1360	91.2%	23.5%

Conclusion

Edentulousness is found to be a serious debilitating condition which causes various deleterious ill effects in the general and oral health. Maintaining the natural teeth reduces the expense on dentures in elderly. Oral health related quality of life can be improved among elderly by treating the retained natural dentition. The oral effects of edentulism are residual ridge resorption, poor masticatory functions, diet modification leading to impaired health, social disability, oral lesions due to improper maintenance of oral cavity. The general health problems are increased risk of coronary heart and peripheral vascular disease, hypertension and various systemic diseases leading to increased mortality rate. Prevention is always better than cure. Hence, measures should be taken to prevent tooth loss by maintaining proper oral health and provide people with dental health education.

Limitations

Only published articles were assessed in writing this review article. Non English language articles were not taken into consideration.

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