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Prevalence of edentulism in a known population and its prevention and its effect on the quality of life

DR. YASIR EDENTULISM

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Abstract

Background: This study was conducted to assess the prevalence of edentulism in a known population and its prevention and its effect on quality of life.

Material and methods: This study was conducted to assess the prevalence of edentulism in a known population and its prevention and its effect on quality of life. The study comprised of total 120 participants. The subjects were informed about the procedure and were asked for consent. the subjects who gave consent for the study had been included in the study. 20 out of 120 participants refused to give consent. Hence, the study comprised of total 100 subjects. All the subjects underwent oral clinical examination. 50 out of 100 subjects had complete edentulism and rest 50 subjects had partial edentulism. The subjects were divided into two groups based on type of edentulism. Group 1 comprised of 50 subjects who had complete edentulism while the rest 50 subjects were assigned to group 2 who had partial edentulism. Statistical analysis was conducted using SPSS software.

Results: In this study, there were 32 males and 68 females. 50 subjects had complete edentulism and were assigned to Group 1 and 50 subjects had partial edentulism and were assigned to Group 2. The subjects who had complete edentulism were treated with complete denture prosthesis while the subjects with partial edentulism were managed with fixed partial denture prosthesis and also with dental implants. Decreased masticatory efficiency was seen in 12 subjects, social embarrassment and isolation was observed in 16 subjects, poor nutrition was reported by 19 subjects. Pain, distress and relaxation problems had been observed amongst 2 subjects, deformity in facial appearance was seen in 3 subjects and difficulty in word articulation had been reported by 5 subjects.

Conclusion: In this study it was observed that the prevalence of complete edentulism was 50% and the prevalence of partial edentulism was 50%. The subjects with complete edentulism had been treated with complete denture prosthesis whereas the subjects with partial edentulism had been planned for dental implants and fixed partial denture prosthesis. The adverse effects of edentulism on quality of life of the subjects included decreased masticatory efficiency, poor nutrition, difficulty in word articulation, pain, distress and relaxation problems, deformity in facial appearance and social embarrassment and isolation.

Keywords: Edentulism, Dental implants, Quality of life, Complete denture, FPD

Introduction

Edentulism refers to the condition of being without natural teeth. Complete edentulism denotes an oral cavity devoid of any teeth. The presence of adequate dentition is crucial for overall well-being and quality of life. This condition represents a significant public health challenge, particularly among the elderly, and has notable implications for primary care practices. Edentulism is a severe and irreversible condition, often regarded as a definitive indicator of the disease burden related to oral health. Individuals experiencing edentulism display a diverse array of physical characteristics and health issues. The loss of teeth can adversely impact functions such as mastication and speech, and may lead to aesthetic concerns, ultimately diminishing the quality of life.¹⁻⁵

Oral health plays a crucial role in an individual's overall well-being, to the extent that it can impede one's capacity to perform work-related tasks and maintain focus on daily activities. While not directly life-threatening, the complete absence of teeth, or edentulism, can profoundly affect a person's quality of life, particularly among the elderly, who often experience more persistent and severe oral health issues due to longstanding neglect in favor of other health concerns. Research conducted by Dolan has characterized oral health in a comprehensive manner, describing it as "a comfortable and functional dentition which allows individuals to continue in their desired social role."⁶

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Material and methods

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Results

Table 1: Gender-wise distribution of subjects

Gender	Number of subjects	Percentage
Male	32	32
Female	68	68
Total	100	100

In this study, there were 32 males and 68 females.

Table 2: Group-wise distribution of subjects based on type of edentulism.

Groups	Number of subjects	Percentage
Group 1 (Complete)	50	50
Group 2 (Partial)	50	50
Total	100	100

50 subjects had complete edentulism and were assigned to Group 1 and 50 subjects had partial edentulism and were assigned to Group 2.

Table 3: Treatment of edentulism

Type of edentulism	Treatment
Complete edentulism	Complete denture prosthesis
Partial edentulism	Fixed partial denture prosthesis Dental implants

The subjects who had complete edentulism were treated with complete denture prosthesis while the subjects with partial edentulism were managed with fixed partial denture prosthesis and also with dental implants.

Table 4: Effect of edentulism on quality of life of subjects.

Consequences of edentulism	Number of subjects
Decreased masticatory efficiency	12
Social embarrassment and isolation	16
Modification of nutrition	19
Pain, distress and relaxation problems	02
Deformity in facial appearance	03

Difficulty in word articulation	05
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Decreased masticatory efficiency was seen in 12 subjects, social embarrassment and isolation was observed in 16 subjects, poor nutrition was reported by 19 subjects. Pain, distress and relaxation problems had been observed amongst 2 subjects, deformity in facial appearance was seen in 3 subjects and difficulty in word articulation had been reported by 5 subjects.

Discussion

In the United States, a study conducted by Slade et al.⁶ surveyed a sample of 432,519 adults, revealing that the prevalence of edentulism among individuals aged 15 years and older was 4.9%. In Canada, the overall edentulism rate in 2010 was reported at 6.4%, with a significantly higher prevalence of 21.7% observed in adults aged 60 to 79 years.⁷

Furthermore, the incidence of edentulism varies considerably across different regions within a country. In Canada, for instance, the rates differ markedly among provinces, ranging from 14% in Quebec to 5% in the Northwest Regions, influenced by factors such as access to fluoridated water and smoking habits. In Brazil, it has been noted that more industrialized and affluent states exhibit lower rates of edentulism compared to less developed areas of the country.^{8,9}

The effect of masticatory efficiency on food selection is likely to be compounded by food preparation. A person with reduced chewing efficiency may overprepare (e.g., removing the skin from fruits and vegetables) or overcook fresh foods in an effort to make consumption practical. A broad range of nutrients are affected by these practices, including foodstuffs that are thought to be important for cancer prevention (e.g., non-starch polysaccharides or dietary fiber) and cellular defense and combating the effects of aging (e.g., the antioxidant micronutrient Vitamins C and E).¹⁰ Patients who are edentulous tend to favor softer and more processed foods, which are typically higher in cholesterol and fat content.¹¹ It may also be lacking in vitamins and minerals. Therefore, being edentulous may predispose one to comorbidities, owing to difficulty in obtaining sufficient nutrition and thereby affecting general health status of an individual.^{12,13}

A number of papers recently have related oral health to systemic health, most notably to atherosclerotic disease and pneumonia in debilitated subjects.¹⁴ The prime focus for these papers is the role of periodontal pathogens and their associated circulating inflammatory markers in the initiation and progression of the formation of atherosclerotic plaques and hence disease.¹⁵ A significant body of evidence also associates dietary imbalance with a

variety of systemic illnesses. Reduction in dietary fiber and in fruits and vegetables consumption is associated with an increased risk of cardiovascular disease.¹⁶ The mechanisms for this interaction have not been clarified fully but probably relate both to the lipid-lowering capabilities of soluble fiber. It also includes the antioxidant effect from fruits and vegetables. Strong associations have been found between increased fruit and vegetable intake and reduced risk of esophageal, gastric, and colorectal cancer.

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The aim of the study conducted by Borg-Bartolo R et al¹⁷ was to analyze data collected from studies worldwide on the prevalence of edentulism and dental caries, in community-dwellers aged ≥ 45 years. Inclusion criteria; participants aged ≥ 45 years, community-dwellers. Exclusion criteria; participants aged < 45 years, in nursing homes, data obtained from dental clinics or pre-2005. The quality assessment tool by The National Heart, Lung and Blood Institute for Observational Cohort and Cross-sectional studies was used. Meta-analysis using the random-effects model (95% confidence interval) was done with data on participants who were edentulous and/or had active dental caries and stratified by regions of the world, age and Gross National Income per capita. Limitations in the data arose from several factors such as design of the studies included differences in socioeconomic status and access to health care among different countries. Experts from different countries were contacted to identify National oral health surveys (NOHS) conducted from 2010 onwards. Eighty-six papers and seventeen NOHS were selected for data extraction. Majority of the studies ($n = 69$) were cross-sectional and of fair quality. 1.1%-70%, 4.9% - 98% prevalence of edentulism and dental caries, respectively. 22%, 45% estimated random-effects pooled prevalence of edentulism and dental caries, respectively. Within the limitations of this study, the findings indicate that untreated dental caries and tooth loss are prevalent on a global level with wide variations among different countries, age groups and socioeconomic status.

The study conducted by Go H et al¹⁸ examined trends in the incidence of edentulism among the older Korean population using data from the Korean National Health Insurance Service (KNHIS). Data on older adults, aged ≥ 75 years of age, were obtained from the KNHIS for the period 2013-2018. Edentulism was defined as a treatment history of complete dentures in the KNHIS database. The exclusion criteria consisted of both disease codes and treatment codes related to conservative dental treatment, including periodontal and extraction treatment afterward. Crude incidence rates (CIRs) and age-standardized incidence rates (AIRs) with 95% confidence intervals were calculated and reported per 100,000 person-years by the direct method. Trends were tested by Cochran Armitage models. Statistically significant increasing trends in both CIRs and AIRs were found among the older Korean population registered in the KNHIS (CIRs, 707.92 to 895.92; AIRs, 705.11 to 889.68; $p < 0.01$). The incidence tended to increase in both genders ($p < 0.01$). Both CIRs and AIRs in specific regions also showed slight but significant annual increases except for Jeju Island ($p < 0.01$ or < 0.05). The incidence showed increasing trends ($p < 0.01$) in all income quintiles apart from the highest quintile. The edentulism incidence was highest in the lowest income group (the first quintile). Their data showed that the incidence of edentulism among the elderly showed an increasing trend from 2013 to 2018. This result provides a basis for future epidemiological studies on the incidence of edentulism in the older Korean population.

Conclusion

In this study it was observed that the prevalence of complete edentulism was 50% and the prevalence of partial edentulism was 50%. The subjects with complete edentulism had been treated with complete denture prosthesis whereas the subjects with partial edentulism had been planned for dental implants and fixed partial denture prosthesis. The adverse effects of edentulism on quality of life of the subjects included decreased masticatory efficiency, poor nutrition, difficulty in word articulation, pain, distress and relaxation problems, deformity in facial appearance and social embarrassment and isolation.

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