RESEARCH PAPER

Occurrence Rate of Edentulism and Dental Caries in a Known Population and Their Treatment with Denture Prosthesis and Root Canal Treatment, Respectively

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ABSTRACT

Background

This study was undertaken to evaluate the prevalence of edentulism and dental caries within a defined population, as well as the management of these conditions through denture prosthetic rehabilitation and root canal therapy, respectively.

Material and Methods

This study was undertaken to evaluate the prevalence of edentulism and dental caries in a defined population and to assess their management through denture prosthetic rehabilitation and root canal therapy, respectively. A total of 100 subjects were included in the study and underwent comprehensive oral clinical examination. The study protocol was explained to all participants, and written informed consent was obtained prior to their inclusion. The prevalence of edentulism and dental caries was recorded, and individualized treatment plans were formulated for each subject. The collected data were analyzed, and statistical evaluation was performed using SPSS software.

Results

The prevalence of dental caries among the study population was found to be 33%. Complete edentulism was observed in 30 subjects, while 37 subjects exhibited partial edentulism. Pit and fissure carious lesions were restored using composite resin restorations, whereas grossly decayed teeth were treated with root canal therapy. Patients with complete edentulism were rehabilitated with complete dentures, while those with partial edentulism were managed using fixed partial dentures and dental implants according to their clinical requirements.

Conclusion

The prevalence of dental caries in the study population was 33%. Complete edentulism was observed in 30 subjects, while 37 subjects exhibited partial edentulism. Thus, the overall prevalence of edentulism was 67%, indicating that more than two-thirds of the participants experienced either complete or partial loss of natural teeth.

Keywords: Dental caries, Edentulism, Cysts, Malocclusion, Treatment.

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Introduction

Edentulism is defined as the loss of natural teeth, resulting in a condition known as edentulousness. Complete edentulism refers to the absence of all natural teeth in the oral cavity. The presence of a functional dentition is essential for maintaining oral health, general well-being, and overall quality of life. Edentulism remains a significant public health concern, particularly among older adults, and poses considerable challenges to healthcare systems and primary care services. As an irreversible condition, it is often considered a key indicator of the

cumulative burden of oral diseases. Individuals with edentulism may experience a range of physical and psychosocial problems. Tooth loss can impair essential functions such as mastication and speech, compromise facial aesthetics, and negatively affect self-esteem and social interactions, thereby substantially reducing quality of life.[1-3]

The management of dental caries has undergone substantial transformation in recent years. Contemporary approaches emphasize the early detection of carious lesions and the implementation of preventive strategies.[4-6] These modern concepts are founded on comprehensive diagnostic procedures that incorporate the evaluation of caries risk indicators and risk factors, enabling clinicians to identify individuals at greater risk and formulate personalized preventive and therapeutic interventions.[7,8]

Modern caries management strategies are designed to preserve healthy tooth structure in accordance with the principles of minimally invasive dentistry. This approach emphasizes the adoption of a preventive philosophy, individualized caries risk assessment, early identification of carious lesions, and the promotion of remineralization of non-cavitated lesions. By focusing on disease prevention and conservation of tooth tissue, minimally invasive dentistry seeks to improve long-term oral health outcomes while reducing the need for extensive restorative procedures.[9,10]

This study was conducted to assess the occurrence rate of edentulism and dental caries in a known population and their treatment with denture prosthesis and root canal treatment, respectively.

Material and methods

This study was conducted to assess the occurrence rate of edentulism and dental caries in a known population and their treatment with denture prosthesis and root canal treatment, respectively. The study comprised of 100 subjects who underwent oral clinical examination. The subjects had been explained about the procedure and were asked for written consent. All the subjects provided consent for the study. The occurrence rate of edentulism and dental caries had been assessed. The treatment plan for all the subjects had been made. The findings were evaluated and statistical analysis was conducted using SPSS software.

Results

Table 1: Prevalence of dental caries

Prevalence	Number of subjects	Percentage
Present	33	33
Absent	67	67
Total	100	100

The prevalence of dental caries was 33%.

Table 2: Prevalence of edentulism

Type of edentulism	Number of subjects
Complete	30
Partial	37
Total	67

The prevalence of edentulism was 67%. 30 subjects had complete edentulism and 37 subjects had partial edentulism.

Table 3: Treatment plan

Condition	Treatment
Dental caries	
Pit and fissure caries	Composite restoration
Grossly carious teeth	Root canal treatment
Edentulism	
Complete	Complete denture
Partial	Fixed partial denture, Implants

The pit and fissure caries were treated with composite restoration. Grossly carious teeth were managed with root canal treatment. Complete edentulism was treated by giving complete denture to the patient and partial edentulism was managed with fixed partial dentures and implants.

Discussion

Socioeconomic factors play a crucial role in the occurrence and distribution of edentulism. Variables such as low income, limited educational attainment, and inadequate social support are strongly associated with tooth loss, particularly among older adults. However, edentulism is not restricted to the elderly population and may also affect younger individuals, where factors such as cultural beliefs, accessibility to dental care services, and socioeconomic status contribute to its development. These determinants significantly influence the prevalence and pattern of both complete and partial edentulism across developed and developing nations.[11]

Eklund and Burt reported that although the overall prevalence of edentulism has declined over time, individuals with lower levels of education and income remain substantially more likely to become edentulous. Their findings demonstrated a strong association between edentulism and socioeconomic status, indicating that socioeconomic variables are

significant predictors of tooth loss and the number of remaining natural teeth. These observations highlight the importance of addressing social and economic disparities to improve oral health outcomes and reduce the burden of edentulism.[12]

This study was conducted to assess the occurrence rate of edentulism and dental caries in a known population and their treatment with denture prosthesis and root canal treatment, respectively.

In this study, the prevalence of dental caries was 33%. 30 subjects had complete edentulism and 37 subjects had partial edentulism. The pit and fissure caries were treated with composite restoration. Grossly carious teeth were managed with root canal treatment. Complete edentulism was treated by giving complete denture to the patient and partial edentulism was managed with fixed partial dentures and implants.

The aim of the study conducted by Borg-Bartolo R et al[13] 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.

Pandey P et al[14] evaluated the pooled prevalence of dental caries among Indian population through systematic review and meta-analysis. A keyword search was conducted in PubMed, Science Direct, Google Scholar, Cochrane, and Scopus databases using relevant key words to extract the data pertaining to dental caries in Indian population. The search criteria included manuscripts published in English language from March 2009 to March 2019 and employed standard Boolean operators. The studies which met the inclusion criteria were independently reviewed by two researchers and their quality was assessed by the Newcastle–Ottawa Scale. The overall prevalence was deduced using the random effects model with prime focus given to the site of anatomical origin. R software version 3.5.2. was used for statistical analysis. Post screening, out of the 253 articles identified, 70 met the inclusion criteria and were used to generate the meta-analysis. Among them, only few studies investigated the prevalence of root caries (n = 1). Overall prevalence of dental caries was 54.16% (CI: 0.4966–0.5866), whereas age-specific prevalence was 62% in patients above 18 years and 52% among 3–18 years of age ($P < 0.0001$). Maximum overall prevalence was noted in mixed dentition (58%). Region wise prevalence was more in western India (72%). Use of decayed, missed, and filled teeth as diagnostic criteria for early childhood caries was only 29%. Besides an overall prevalence of 54.16%, there exists a remarkable variation in dental caries prevalence rates as per age, diagnostic criteria, dentition, and geographical region. Furthermore, research should be focused on the prevalence of anatomical site specific caries as well.

Conclusion

The prevalence of dental caries in the study population was 33%. Complete edentulism was observed in 30 subjects, while 37 subjects exhibited partial edentulism. Thus, the overall prevalence of edentulism was 67%, indicating that more than two-thirds of the participants experienced either complete or partial loss of natural teeth.

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