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Occurrence Rate of Edentulism, Dental Caries, Cysts and Malocclusion in a Known Population and Their Treatment with Denture Prosthesis, Root Canal Treatment, Surgical Procedures and Orthodontic Appliances, Respectively.

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KEYWORDS

Dental caries, Edentulism, Cysts, Malocclusion, Treatment

ABSTRACT:

Background: This study was conducted to assess the occurrence rate of edentulism, dental caries, cysts and malocclusion in a known population and their treatment with denture prosthesis, root canal treatment, surgical procedures and orthodontic appliances, respectively.

Material and methods: This study was conducted to assess the occurrence rate of edentulism, dental caries, cysts and malocclusion in a known population and their treatment with denture prosthesis, root canal treatment, surgical procedures and orthodontic appliances, 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. It had been observed that out of 100, 25 subjects had malocclusion, 25 subjects had edentulism, 25 subjects had cysts in their oral cavity and 25 subjects had dental caries. Hence, they were divided into 4 groups of 25 each. The treatment plan for all the subjects had been made. Denture prosthesis had been made for the subjects with edentulism, root canal treatment was planned for the subjects who had grossly carious teeth, orthodontic appliances had been fabricated for the subjects with malocclusion and surgical procedures like enucleation and marsupialization was carried out for the subjects with cysts in their oral cavity. Statistical analysis was conducted using SPSS software.

Results: The prevalence of dental caries was 23%. 15 subjects had class 2 malocclusion and 4 subjects had class 3 malocclusion. The total prevalence of malocclusion in this study was 19%. 13 subjects had dentigerous cyst, 10 had radicular cyst and 3 subjects had odontogenic keratocyst in their oral cavity. 20 subjects had complete edentulism and 12 subjects had partial edentulism. The pit and fissure caries were treated with composite restoration. Grossly carious teeth were managed with root canal treatment. Class 2 malocclusion was treated with twin block appliance, Jasper Jumper appliance and Herbst appliance. Class 3 malocclusion was managed with Frankel III appliance, chin cap and reverse twin block appliance. OKC was managed with enucleation. Dentigerous cyst was managed with enucleation and marsupialization and Radicular cyst was treated with apicoectomy. Complete edentulism was treated by giving complete denture to the patient and partial edentulism was managed with fixed partial dentures and implants.

Conclusion: The prevalence of dental caries was 23%. 15 subjects had class 2 malocclusion and 4 subjects had class 3 malocclusion. The total prevalence of malocclusion in this study was 19%. 13 subjects had dentigerous cyst, 10 had radicular cyst and 3 subjects had odontogenic keratocyst in their oral cavity. 20 subjects had complete edentulism and 12 subjects had partial edentulism. The total prevalence of edentulism was 32%.

Introduction

Edentulism refers to the condition of being without natural teeth, known as edentulousness. Complete edentulism signifies the absence of all teeth within the oral cavity. The presence of adequate dentition is crucial for maintaining overall well-being and quality of life. This condition represents a significant public health challenge, particularly among the elderly, and has notable implications for the delivery of primary care services. Edentulism is a severe and irreversible condition, often regarded as a definitive indicator of the disease burden associated with oral health. Individuals experiencing edentulism may present with a diverse array of physical characteristics and health issues. The loss of teeth can adversely impact functions such as mastication and speech, as well as lead to aesthetic concerns, all of which can detrimentally influence an individual's quality of life.[1-3]

Management of dental caries has changed significantly in recent years.[4-6] The most contemporary practical approaches are based on early caries detection and prevention. They are also built on making a diagnosis based on risk indicators and risk factor assessment.[7,8]

The new management approaches aim to preserve healthy tissue, as proposed in minimally invasive dentistry. This aims to achieve several goals, such as the implementation of a preventive philosophy, individualised risk assessments for patients, early detection of carious lesions, and remineralization of the non-cavitated lesion.[9,10]

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

Material and methods

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Results

Table 1: Prevalence of dental caries

Prevalence	Number of subjects	Percentage
Present	23	23
Absent	77	77
Total	100	100

The prevalence of dental caries was 23%.

Table 2: Prevalence of malocclusion

Type of malocclusion	Number of subjects	Percentage
Angle's Class 2 malocclusion	15	15
Angles's Class 3 malocclusion	04	04
Total	19	19

15 subjects had class 2 malocclusion and 4 subjects had class 3 malocclusion. The total prevalence of malocclusion in this study was 19%.

Table 3: Prevalence of cysts

Type of cyst	Number of subjects	Percentage
Dentigerous cyst	13	13
Radicular cyst	10	10
Odontogenic keratocyst	03	03
Total	26	26

13 subjects had dentigerous cyst, 10 had radicular cyst and 3 subjects had odontogenic keratocyst in their oral cavity.

Table 4: Prevalence of edentulism

Type of edentulism	Number of subjects	Percentage
Complete	20	20
Partial	12	12
Total	32	30

20 subjects had complete edentulism and 12 subjects had partial edentulism.

Table 5: Treatment plan

Condition	Treatment
Dental caries	
Pit and fissure caries	Composite restoration
Grossly carious teeth	Root canal treatment
Malocclusion	
Class 2 malocclusion	Twin block appliance, Jasper Jumper appliance, Herbst appliance
Class 3 malocclusion	Frankel III appliance, Chin cap, Reverse twin block appliance
Cysts	
OKC	Enucleation
Dentigerous cyst	Enucleation and marsupialization
Radicular cyst	Apicoectomy
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. Class 2 malocclusion was treated with twin block appliance, Jasper Jumper appliance and Herbst appliance. Class 3 malocclusion was managed with Frankel III appliance, chin cap and reverse twin block appliance. OKC was managed with enucleation. Dentigerous cyst was managed with enucleation and marsupialization and Radicular cyst was treated with apicoectomy. Complete edentulism was treated by giving complete denture to the patient and partial edentulism was managed with fixed partial dentures and implants.

Discussion

Orthodontics seeks to achieve esthetic and functional improvement via mechanical therapy that moves teeth into a more ideal position. Determining the ideal dental position for each patient depends on several factors, such as the facial profile, facial balance, and aesthetic

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concerns. In addition to facial problems, orthodontics looks to improve the relationship between the maxillary and mandibular teeth when they come together and function. The biological and functional coordination of how teeth come together is termed occlusion. Over the years, a consensus has been reached on what features are regarded as an ideal or normal occlusion.[11]

However, it is not common to find individuals who exhibit the qualities of an ideal occlusion without receiving orthodontic treatment. Morphological differences in tooth shape and size and sagittal positions of the maxilla and mandible create a plethora of occlusions that an individual can display. Only 8% of cases of malocclusion have a known cause. The remaining 92% have unknown etiology but likely result from environmental and genetic factors.[11]

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

The prevalence of dental caries was 23%. 15 subjects had class 2 malocclusion and 4 subjects had class 3 malocclusion. The total prevalence of malocclusion in this study was 19%. 13 subjects had dentigerous cyst, 10 had radicular cyst and 3 subjects had odontogenic keratocyst in their oral cavity. 20 subjects had complete edentulism and 12 subjects had partial edentulism. The pit and fissure caries were treated with composite restoration. Grossly carious teeth were managed with root canal treatment. Class 2 malocclusion was treated with twin block appliance, Jasper Jumper appliance and Herbst appliance. Class 3 malocclusion was managed with Frankel III appliance, chin cap and reverse twin block appliance. OKC was managed with enucleation. Dentigerous cyst was managed with enucleation and marsupialization and Radicular cyst was treated with apicoectomy. Complete edentulism was treated by giving complete denture to the patient and partial edentulism was managed with fixed partial dentures and implants.

Kambalimath DH et al[12] determined the prevalence of odontogenic cyst in an Indian population and compared it with various reports from the other geographic areas of the world. The files on odontogenic jaw cysts treated between 2001 and 2011 at the oral and maxillofacial surgery unit were retrieved retrospectively. Patient's demographic information mainly age, sex and location of the lesion was recorded and analyzed using descriptive statistics. The diagnosis of odontogenic cyst accounted in 150 cases and accounted for 15.31 % of all lesions biopsied throughout the period. Mean age of the patient was 32.2 years, and 58 % were males. The overall male to female ratio was 1.38:1. Radicular cyst was most prevalent histological type (48.67 %) followed by dentigerous cyst, odontogenic keratocyst, lateral periodontal cyst, paradental cyst, residual cyst, adult gingival cyst, glandular odontogenic cyst, calcifying odontogenic cyst. The most common locations of the odontogenic cysts were the mandibular (49.33 %) and posterior region (33.33 %). The distribution pattern of odontogenic cyst in this study is relatively similar to that in other parts of the world but there are some geographic differences with regard to the relative frequency, sex, and anatomic distribution of the odontogenic cyst.

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

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global level with wide variations among different countries, age groups and socioeconomic status.

Balachandran P et al[14] assessed the prevalence of malocclusion among 8–15 years old Indian children. The review protocol was registered in PROSPERO data with register number CRD42020214211. They employed the standard methodological procedures according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement. Electronic search was done in PubMed database and other sources in 2020 to identify studies. Only studies published in English after January 1, 2000 that assessed prevalence of malocclusion using Dental aesthetic Index (DAI) or Angle's classification of malocclusion were considered for screening. Selection of articles, data extraction and validity assessment were done independently by the two reviewers. Pooled prevalence of malocclusion is 35.40% (CI:35.37–35.43, 54 studies, 97959 participants). Males had higher proportion of malocclusion (36.20%, CI: 36.12–36.28,33 studies, 40456 participants). 13 years had higher prevalence of malocclusion (33.50%, CI:33.34–33.66, 11 studies, 3366 participants). Prevalence of malocclusion was higher among urban population (32.78%, CI:32.71 32.85,11 studies, 18313 participants). South India showed higher prevalence of malocclusion (39.58%, CI:39.54–39.62, 41 studies, 58645 participants). Prevalence of malocclusion as assessed by mean DAI score was 21.23 (CI:21.14–21.33,11 studies, 12345 participants). The pooled prevalence of malocclusion among 8–15 years children in India is 35.40% (CI:35.37–35.43,54 studies, 97959 participants). Included studies were heterogeneous in their methods of assessment of malocclusion.

Conclusion

The prevalence of dental caries was 23%. 15 subjects had class 2 malocclusion and 4 subjects had class 3 malocclusion. The total prevalence of malocclusion in this study was 19%. 13 subjects had dentigerous cyst, 10 had radicular cyst and 3 subjects had odontogenic keratocyst in their oral cavity. 20 subjects had complete edentulism and 12 subjects had partial edentulism. The total prevalence of edentulism was 32%.

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