

## Prevalence and treatment of malocclusion with myofunctional appliances and dental caries, and in children of a known population.

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### Abstract

**Background:** This study was conducted to assess the prevalence of malocclusion with myofunctional appliances and dental caries in children of a known population.

**Material and methods:** In this study, 100 children aged from 11-20 years were included. Full mouth examination of all the participants was carried out. Informed consent was recorded from these participants before starting the procedure. The mean age of the children was 15.7 years. Statistical analysis was conducted using SPSS software. It was found that 35 children had class 2 malocclusion; hence for them, twin block appliance and jasper jumper appliance were fabricated.

**Results:** It was found that out of 100 participants, 65 had dental caries and 35 subjects had class 2 malocclusion. The subjects having dental caries underwent root canal treatment followed by crown. And in the subjects having class 2 malocclusion, twin block appliance was given in 12 subjects and in the remaining 15 subjects, jasper jumper was given.

**Conclusion:** In the present study, dental caries was the more prevalent among the children followed by class 2 malocclusion. Root canal treatment was performed to treat dental caries followed by crown placement. Twin block appliance and Jasper Jumper appliances were used in children to treat class 2 malocclusion.

**Keywords:** dental caries, RCT, twin block, jasper jumper, prevalence, treatment.

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### Introduction

Malocclusion refers to any abnormal relationship between dental arches, with or without irregularities in the teeth.<sup>1</sup> It is recognized as a developmental disorder and a significant public dental health issue, characterized by high prevalence and substantial treatment requirements.<sup>2</sup> Disruptions in oral functions such as mastication, speech, and swallowing may lead to oro-facial adaptability, which can contribute to malocclusion. This, in turn, adversely affects an individual's social wellbeing.<sup>3</sup> In numerous studies, Angle's classification has been extensively utilized as a qualitative epidemiological instrument.<sup>3</sup> Various investigations into the prevalence of occlusal traits across different populations have been documented in orthodontic literature, and research focused on isolated human populations can yield critical insights into the underlying causes of malocclusion.<sup>4</sup>

The management of dental caries has undergone significant transformations in recent years. The most modern practical strategies emphasize early detection and prevention of caries. These approaches are also predicated on diagnosing based on risk indicators and assessing risk factors.<sup>5</sup>

Hence, this study was conducted to assess the prevalence of malocclusion with myofunctional appliances and dental caries in children of a known population.

### Material and methods

In this study, 100 children aged from 11-20 years were included. Full mouth examination of all the participants was carried out. Informed consent was recorded from these participants before starting the procedure. The mean age of the children was 15.7 years. Statistical analysis was conducted using SPSS software. It was found that 35 children had class 2 malocclusion; hence for them, twin block appliance and jasper jumper appliance were fabricated.

### Results

**Table 1: prevalence of various dental anomalies.**

| Dental anomalies     | Number of subjects | Percentage |
|----------------------|--------------------|------------|
| Dental caries        | 65                 | 65         |
| Class 2 malocclusion | 35                 | 35         |
| Total                | 100                | 100        |

It was found that out of 100 participants, 65 had dental caries and 35 had class 2 malocclusion.

**Table 2: treatment of the dental anomalies.**

| Dental anomalies     | Treatment                               |
|----------------------|-----------------------------------------|
| Dental caries        | Root canal treatment followed by crown. |
| Class 2 malocclusion | Twin block appliance and Jasper Jumper  |

The subjects having dental caries underwent root canal treatment followed by crown. And in the subjects having class 2 malocclusion, twin block appliance was given in 12 subjects and in the remaining 15 subjects, jasper jumper was given.

### Discussion

In 1987, the World Health Organization classified malocclusion as a handicapping dentofacial anomaly, defining it as "an anomaly which causes disfigurement or which impedes function, and requires treatment if the disfigurement or functional defect was likely to be an obstacle to the patient's physical or emotional well-being."<sup>6</sup> Angle further characterizes malocclusion as "any deviation from the normal occlusion of teeth."<sup>7</sup> Frequently misconstrued as a disease, malocclusion is actually a developmental condition that significantly influences an individual's self-esteem and social acceptance. The importance of early identification and intervention for malocclusion is underscored by its association with the onset of periodontitis, dental caries, temporo-mandibular disorders, and trauma. Additionally, malocclusion negatively impacts essential oral functions such as mastication, swallowing, and speech.<sup>8</sup>

Root canal treatment, also known as endodontic therapy, involves the removal of inflamed or infected pulp, followed by cleaning, disinfecting, and sealing the interior of the tooth with a restorative material. This procedure boasts a high success rate; however, symptom persistence or recurrence of infection may occur in 10% to 15% of cases.<sup>9</sup> A systematic review indicated that tooth survival rates two to ten years post-initial root canal treatment range from 86% to 93%.<sup>10</sup>

Class II malocclusions are frequently encountered in orthodontic practice and can be classified as either skeletal or dental, each presenting distinct clinical features. A global estimate suggests that the

prevalence of Class II malocclusion exceeds 20% in regions such as North America, Europe, and North Africa.<sup>11</sup> A study conducted by McNamara in 1981 revealed that 60% of Class II malocclusions were found in children with a retrognathic mandible.<sup>12</sup> The contemporary objective of orthodontic treatment is to achieve optimal facial aesthetics alongside normal dental occlusion.

Hence, this study was conducted to assess the prevalence of malocclusion with myofunctional appliances and dental caries in children of a known population.

In this study, it was found that out of 100 participants, 65 had dental caries and 35 had class 2 malocclusion. The subjects having dental caries underwent root canal treatment followed by crown. And in the subjects having class 2 malocclusion, twin block appliance was given in 12 subjects and in the remaining 13 subjects, jasper jumper was given. Khan MI et al<sup>13</sup> evaluated the dentoskeletal effects produced by the Twin Block appliance for the correction of Class II division 1 malocclusion with retrognathic mandible. Pre-treatment (T1) and post-treatment (T2) lateral cephalograms of 30 patients treated with Twin Block appliance (mean age = 10.8 ± 1.2 years) for the correction of class II division 1 malocclusion were compared with the 30 untreated class II control patients (mean age 11.2 ± 0.8 years) who did not undergo any treatment during this period. Both the groups were evaluated for the dentoskeletal changes using 24 angular and linear cephalometric measurements. The differences between the pre and post-treatment were calculated using a paired t-test. The cephalometric analysis revealed that the Twin Block appliance stimulated mandibular growth and statistically significant differences were found between the two groups. Twin Block patients showed a statistically very high significant ( $p < 0.001$ ) increase in mandibular length (6.02 mm) compared with the control group (0.3 mm). "Headgear effect" on the maxilla, increase in lower anterior facial height, significant reduction of overjet, overbite and Class I molar relationship were achieved in the Twin Block group. However, no significant changes appeared in the control group. The results of the present study concluded that the Twin Block appliance is effective in the treatment of Class II malocclusion and this is due to a combination of skeletal and dentoalveolar changes in both the arches.

Youssefi MA et al<sup>14</sup> assessed the prevalence and associated factors of dental caries in primary schoolchildren in Yasuj township, Iran. In this cross-sectional study, a total of 460 children aged 7–12 years were investigated. Dental examination was performed at school according to the World Health Organization criteria. Sociodemographic data were collected using a structured questionnaire, and caries statuses of children's teeth were recorded through a dental chart. Data were analyzed using summary

statistics, chi-square test, and logistic regression model with odds ratio. The prevalence of dental caries in primary, permanent, and whole dentition among children was 75.3%, 41.1%, and 89.8%, respectively. Among all considered factors, the caries presence in primary teeth was inversely ( $p < 0.001$ ) and in permanent teeth was positively ( $p < 0.001$ ) associated with the children's age. Moreover, the odds of decaying permanent teeth were significantly higher in girls, in rural children, and in children whose fathers were not an employee compared to their counterparts ( $p=0.04$ ,  $p < 0.001$ , and  $p=0.02$ , respectively). The prevalence of dental caries among the studied primary schoolchildren in mixed dentition was high and associated with their sociodemographic factors. Providing and implementing preventive, therapeutic, and informative programs for controlling dental caries at individual, family, and school levels are necessary for local health policymakers.

### Conclusion

In the present study, dental caries was the more prevalent among the children followed by class 2 malocclusion. Root canal treatment was performed to treat dental caries followed by crown placement. Twin block appliance and Jasper Jumper appliances were used in children to treat class 2 malocclusion.

### References

1. Angle E.H. Classification of malocclusion. *Dent Cosmos*. 1899;41:248–264.
2. Das U.M., Venkatsubramanian Reddy D. Prevalence of malocclusion among school children in Bangalore, India. *Int J Clin Pediatr Dent*. 2008;1:10–12.
3. Tak M., Ramesh N., Sharda A.J., et al. Prevalence of malocclusion and orthodontic treatment needs among 12-15 years old school children of Udaipur, India. *Eur J Dermatol*. 2013;7:45–53.
4. Al Jadidi L., Sabrish S., Shivamurthy P.G., Senguttuvan V. The prevalence of malocclusion and orthodontic treatment need in Omani adolescent population. *J Orthodont Sci*. 2018;7:21–27.
5. European Society of Endodontology (Ese), Duncan H. F., Galler K. M., et al. European Society of Endodontology position statement: management of deep caries and the exposed pulp. *International Endodontic Journal*. 2019;52:923–934.
6. Lennon S., Duncan H. F. Minimally invasive endodontics – pulp fact or pulp fiction? *Journal of the Irish Dental Association*. 2020;66:135–138.
7. Barrett B., O'Sullivan M. Management of the deep carious lesion: a literature review. *Journal of the Irish Dental Association*. 2021;67:36–42.
8. Deery C. Caries detection and diagnosis, sealants and management of the possibly carious fissure. *British Dental Journal*. 2013;214(11):551–557.
9. Sanadhya S, Chadha M, Chaturvedi MK, Chaudhary M, Lerra S, Meena MK, et al. Prevalence of malocclusion and orthodontic treatment needs among 12–15-year-old schoolchildren of fishermen of Kutch coast, Gujarat, India. *Int Marit Health*. 65(3):106–113.
10. Lieblisch SE. Endodontic surgery. *Dent Clin North Am*. 2012 Jan;56(1):121–ix.
11. Ng YL, Mann V, Gulabivala K. Tooth survival following non-surgical root canal treatment: a systematic review of the literature. *Int Endod J*. 2010 Mar;43(3):171–89.
12. Sharma D.S., Avasthi D.A., Kumar D.S., Singh D.N. Epidemiology of malocclusion: an Indian perspective-review article. *Scholars Journal of Dental Sciences*. 2019;6(3):142–147.
13. Khan MI, Neela PK, Unnisa N, Jaiswal AK, Ahmed N, Purkayastha A. Dentoskeletal effects of Twin Block appliance in patients with Class II malocclusion. *Med Pharm Rep*. 2022 Apr;95(2):191-196.
14. Youssefi MA, Afroughi S. Prevalence and Associated Factors of Dental Caries in Primary Schoolchildren: An Iranian Setting. *Int J Dent*. 2020 Jan 21;2020:8731486.