

## **ASSOCIATION OF DENTAL CARIES WITH MALOCCLUSION: AN OBSERVATIONAL STUDY**

N. Zahid<sup>1</sup>, S. W. Qureshi<sup>2</sup>, M. S. Nawaz<sup>3</sup>, A. M. Ikram<sup>4</sup>, G. Amin<sup>5</sup>, A. U. Hassan<sup>6</sup>, and A. Tariq<sup>7</sup>

<sup>1</sup>Lecturer, Department of Operative Dentistry, University College of Medicine & Dentistry, University of Lahore

<sup>2</sup>Associate professor, Department of Oral and Maxillofacial surgery, University College of Medicine and Dentistry, University of Lahore, <sup>3</sup>Asisstant professor, Department of prosthodontics, University College of Medicine and Dentistry, University of Lahore, <sup>4</sup>Senior Demonstrator, Department of Biochemistry, University College of Medicine and Dentistry, University of Lahore, <sup>5</sup>Assistant Professor, Department of Science of Dental Materials, Islam Dental College, Sialkot, <sup>5</sup>Associate professor, Department of Bio-chemistry, University College of Medicine and Dentistry, University of Lahore, <sup>6</sup>Associate professor, Department of Community and Preventive Dentistry, University College of Medicine and Dentistry, University of Lahore, <sup>7</sup>Postgraduate research coordinator, Research cell, University College of Medicine and Dentistry, University of Lahore

**ABSTRACT:** The current study was designed to explore the frequency of dental caries and malocclusion in children of 3-11year and also to evaluate relationship between dental caries and malocclusion. This observational study was conducted by collecting data of 70 children with dental caries and maloccluded teeth who visited dental teaching hospital from January, 2021 to April, 2021. The results of chi-square revealed a significant relationship between the occurrence of dental caries and malocclusion ( $p=.011$ ). Children diagnosed with dental caries which have maloccluded teeth were 63% whereas children with maloccluded teeth but not diagnosed with dental caries were 37%. In conclusion, higher prevalence of dental caries was found in both maloccluded 63% as well as non-maloccluded teeth 72%.

**Keywords:** Malocclusion, Dental caries, Dental treatment, Tooth anomalies.

(Received

15.05.2021

Accepted 04.06.2021)

## **INTRODUCTION**

Additional to gingival problems, fluorosis and dental caries, malocclusion is also a most prevalent dental problem which is defined teeth irregularity as well as above normal, malrelationship between upper and lower arch (Mtaya, Brudvik, & Astrom, 2009). Genetic factors as well as environmental factors or both are may be the potential cause of development of malocclusion. There are some local factors also which could be a cause of malocclusion development, for instance, tooth abnormalities, teeth positioning or adverse oral habits. Difference of malocclusion rate varies worldwide according to age and gender (Shivakumar, Chandu, Subba Reddy, & Shafiulla, 2009). The occurrence of malocclusion ranges between 39%-93% as reported in epidemiological studies around the globe (Thilander, Pena, Infante, Parada, & de Mayorga, 2001). In India, the incidence of malocclusion differs from 19.6% to 90% (Sandhu, Bansal, & Sandhu, 2012).

The higher malocclusion occurrence indicates that efforts from public health providers are needed because such circumstances affect adversely the quality of life of person, predominantly in case of children as well as among teenagers, who are sensitive about their esthetics (Souza, Magnani, Nouer, Romano, & Passos, 2008). Caries and premature loss of primary teeth are

considered predisposing factors for occlusal and space discrepancies in the mixed and permanent dentitions (Baskaradoss, Geevarghese, Roger, & Thaliath, 2013). Although, dental caries is avoidable but still it is the most commonly occurring oral disease (Tseveenjav, Vekhalahti, & Murtomaa, 2003). Subsequently, the etiology of dental caries is complex and there are numerous unexplained connections among unidentified confounders and risk factors, it is the most prevailing problem in the domain of oral health issues globally (Ferreira, Béria, Kramer, Feldens, & Feldens, 2007).

Numerous research investigations have showed a positive relationship between the dental caries' occurrence and malocclusion (Mtaya, Brudvik, & Astrom, 2009; Shivakumar, Chandu, Subba Reddy, & Shafiulla, 2009; Baskaradoss, Geevarghese, Roger, & Thaliath, 2013; Buczkowska-Radlinska, Szymzka-Sommerfeld, & Wozniak, 2012; Gábris, Márton, & Madléná, 2006; Singh, Purohit, Sequeira, Acharya, & Bhat, 2011). The reason for this association is restricted access for brushing teeth, as well as the natural way of cleansing the teeth with the help of tongue and saliva is also restricted. It delivers supplementary food retention zones and plaque-making oral hygiene additional challenging and in that way inclination of the teeth towards the caries development (Buczkowska-Radlinska, Szymzka-Sommerfeld, & Wozniak, 2012).

Numerous research investigations have been conducted on children with mixed dentition, but some research investigations on the population of India with any degree of precision the variations occurring within this duration. With respect to the substantial alterations in the mentioned malocclusion occurrence and the inadequate outcomes of its possible relationship with dental caries, and the negligible data existing, the current study was designed to explore the frequency of dental caries and malocclusion in children of 3-11 year and also to evaluate relationship between dental caries and malocclusion.

## MATERIALS AND METHODS

**Research design:** To explore the frequency of dental caries and malocclusion in children of 3-11 year and also to evaluate relationship between dental caries and malocclusion, this observational study was designed.

**Sampling technique:** For data collection, consecutive sampling technique was used.

**Sample size:** 70 children with dental caries and malocclusion were taken as the sample of the study who visited dental teaching hospital from January, 2021 to April, 2021.

**Procedure:** Data was collected after the permission of Medical superintendent of the dental teaching hospital from the walk-in patients diagnosed with dental caries falls under desired sample followed by clarifying the research purpose to the parents of patients and consent form got signed by parents on the behalf of their children. The occurrence of dental caries in maloccluded teeth.

**Data analysis:** Chi-square test was used to assess the explore the frequency of dental caries and malocclusion in children of 3-11 year and also to evaluate relationship between dental caries and malocclusion using SPSS version 23.0.

## RESULTS

The results of chi-square revealed a significant relationship between the occurrence of dental caries and malocclusion ( $p=0.011$ ). Children diagnosed with dental caries which have maloccluded teeth were 63% whereas children with maloccluded teeth but not diagnosed with dental caries were 37%. Higher prevalence of dental caries was found in both maloccluded 63% as well as non-maloccluded teeth 72%.

**Table 1. Association between malocclusion and dental caries.**

Dental Caries	Malocclusion		Sig.
	Yes	No	
Yes	63%	72%	
No	37%	28%	0.011

## DISCUSSION

The findings of current study, children diagnosed with dental caries which have maloccluded teeth were 63% whereas children with maloccluded teeth but not diagnosed with dental caries were 37%. Higher prevalence of dental caries was found in both maloccluded 63% as well as non-maloccluded teeth 72%. Additionally, a research investigation concluded insignificant relationship between malocclusion and dental caries, excluding the relationship between the deciduous teeth extraction and midline deviation ( $p=0.07$ ) (Luzzi, Fabbrizi, Coloni, Mastrandri, Mirra, Bossù, Vestri, & Polimeni, 2011). In the same way, a study conducted in South India depicted that significant higher prevalence of dental caries among children with Dental Aesthetic Index scores of  $>35$  were found but the finding was insignificant (Baskaradoss, Geevarghese, Roger, & Thaliath, 2013). In a study conducted on Polish children with maloccluded teeth in the deciduous teeth as well as mixed dentition did not have higher dental caries frequency than children without crowded teeth. The insignificant relationship between crowded teeth and prevalence of dental caries in the forward teeth in primary as well as mixed dentition may be linked to the shorter exposure duration to dental caries stimulating circumstances. Conversely, it was concluded that front teeth crowding, and tooth brushing 2 times a day or less without interdental cleaning aid usage can be reflected as risk factors for caries in teenagers (Buczkowska-Radlinska, Szyszka-Sommerfeld, & Wozniak, 2012).

In conclusion, the main aim of current study was to explore the frequency of dental caries and malocclusion in children of 3-11 year and also to evaluate relationship between dental caries and malocclusion. Among other risk factors, malocclusion is also a serious issue in Pakistan due to the higher rate of malocclusion. Due to the limited data, the generalizability of results is limited.

## REFERENCES

- Baskaradoss, J.K., Geevarghese, A., Roger, C., & Thaliath, A. (2013). Prevalence of malocclusion and its relationship with caries among school

- children aged 11-15 years in Southern India. *Korean J Orthod.*, 43:35-41.
- Buczkowska-Radlinska, J., Szyszka-Sommerfeld, L., & Wozniak, K. (2012). Anterior tooth crowding and prevalence of dental caries in children in Szczecin, Poland. *Community Dent Health*, 29:168-72.
- Ferreira, S.H., Béria, J.U., Kramer, P.F., Feldens, E.G., & Feldens, C.A. (2007). Dental caries in 0- to 5-year-old Brazilian children: Prevalence, severity, and associated factors. *Int J Paediatr Dent.*, 17:289-96.
- Gábris, K., Márton, S., & Madléna, M. (2006). Prevalence of malocclusions in hungarian adolescents. *Eur J Orthod.*, 28:467-70.
- Luzzi, V., Fabbrizi, M., Coloni, C., Mastrandri, C., Mirra, C., Bossù, M., Vestri, A., & Polimeni, A. (2011). Experience of dental caries and its effects on early dental occlusion: a descriptive study. *Annali di stomatologia*, 2(1-2), 13-18.
- Mtaya, M., Brudvik, P., & Astrom, A.N. (2009). Prevalence of malocclusion and its relationship with socio-demographic factors, dental caries, and oral hygiene in 12-14 year-old Tanzanian schoolchildren. *Eur J Orthod.*, 31:467-76.
- Sandhu, S.S., Bansal, N., & Sandhu, N. (2012). Incidence of malocclusions in India – A review. *J Oral Health Commun Dent.*, 6:21-4.
- Shivakumar, K.M., Chandu, G.N., Subba Reddy, V.V., & Shafiulla, M.D. (2009). Prevalence of malocclusion and orthodontic treatment needs among middle and high school children of Davangere city, India by using dental aesthetic index. *J Indian Soc Pedod Prev Dent.*, 27:211-8.
- Singh, A., Purohit, B., Sequeira, P., Acharya, S., & Bhat, M. (2011). Malocclusion and orthodontic treatment need measured by the dental aesthetic index and its association with dental caries in Indian school children. *Community Dent Health*, 28:313-6.
- Souza, R.A., Magnani, M.B., Nouer, D.F., Romano, F.L., & Passos, M.R. (2008). Prevalence of malocclusion in a Brazilian schoolchildren population and its relationship with early tooth loss. *Braz J Oral Sci.*, 7:1566-70.
- Thilander, B., Pena, L., Infante, C., Parada, S.S., & de Mayorga, C. (2001). Prevalence of malocclusion and orthodontic treatment need in children and adolescents in Bogota, Colombia. An epidemiological study related to different stages of dental development. *Eur J Orthod.*, 23:153-67.
- Tseveenjav, B., Vehkalahti, M., & Murtomaa, H. (2003). Dental health of dentists' children in Mongolia. *Int J Paediatr Dent.*, 13:240-5.