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Prevalence of mesiodens in five- to fourteen-year old children in Balidih, Jharkhand, India

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Abstract
Mesiodens are the supernumerary teeth present in the midline of the maxilla between the two central incisors. The present study seeks to investigate the prevalence of mesiodens among children in Balidih, India. The study was a retrospective collection of data to evaluate the prevalence of mesiodens among 3495 children attending the Free Dental Camp Under Indian Dental Association, Bokaro from 2015 to 2018, aged between five to fourteen years. Test of association was done using Pearson's Chi Square test and Cramer's V. The results showed that the prevalence of mesiodens was 0.60% in the observed population. Males were significantly ($P<0.05$) affected approximately 0.80% while females were 0.30% of the total screened population. Significantly ($P<0.05$) higher children from the ages of ten to fourteen years (1.00%) presented with mesiodens than five to nine years (0.40%). The present study gives an insight into the prevalence of mesiodens among school going children of Balidih, Jharkhand, India.

Keywords: mesiodens, prevalence, dental camp

Introduction
Supernumerary tooth is defined as a developmental anomaly of number characterized by the presence of an extra tooth in addition to the normal dentition [1] and can be classified according to their morphology, position and number. The prevalence varies between 0.3 and 3.8% of the population [1]. The most common type of supernumerary tooth is mesiodens [2]. Mesiodens are un-erupted supernumerary teeth, in the central region of the premaxilla, between the two central incisors. Mesiodens is typically located in the midline of the premaxilla, where embryogenesis differs from the other facial bones leading to possible deviations in the premaxillary region. These deviations can lead to the development of additional teeth and other abnormalities. The etiology of mesiodens tooth is not known; however, few theories have been suggested [3]. These include genetic [4] and environmental factors [5]. A second theory known as dichotomy suggests that the tooth bud is split to create two teeth, one of which is the mesiodens [6]. The third theory involving hyperactivity of the dental lamina is the most widely supported. According to this theory, remnants of the dental lamina or palatal offshoots of the active dental lamina are induced to develop into an extra tooth bud, which results in a supernumerary tooth [7]. It may also occur in association with syndromes like cleft lip and palate, Cleidocranial dysplasia and Gardner's syndrome [8].
On the basis of its morphology, mesiodens can be classified as conical, supplemental and tuberculate type [7, 9]. Mesiodens may give rise to a variety of complications, such as impaction, delayed eruption and ectopic eruption of adjacent teeth, crowding, diastema, axial rotation and displacement, radicular resorption of adjacent teeth and dentigerous cyst [7, 9-14].
The literature reports that 80 to 90% of all supernumerary teeth occur in the maxilla, of which half are found in the anterior region [12, 15]. The prevalence of mesiodens ranges between 0.15% and 3.9% while few other sources reported between 0.09 and 2.05% [16-18] in different studies and it is reported to be more common in males than in females [19].
Treatment options includes normal extraction but surgical extraction of mesiodens may be needed if it is impacted. If the permanent teeth do not erupt in a reasonable period after the extraction, surgical exposure and orthodontic treatment may be required to ensure eruption and proper alignment of the teeth. In some cases, fixed orthodontic therapy is also required to create sufficient arch space before eruption and alignment of the incisors [7, 11, 20]. Therefore early diagnosis allows the most appropriate treatment, often reducing the extent of surgery, orthodontic treatment and possible complications. The study was conducted to determine the prevalence rate of mesiodens in the school going children between the age group of 5 years to 14 years.

Methodology
Data collection was done retrospectively through out-patient registers recording clinical evaluation of children visiting the Free Dental Camp organised by Indian Dental Association, Bokaro in Balidih Industrial Area, Jharkhand, India. The records of clinical examination of the children attending the Dental Camp conducted by postgraduate dental surgeons of Indian Dental Association, Bokaro were assessed from 2015 to 2018. Any records indicating clinical presence of mesiodens was noted. Patients were divided into two groups- Junior (5 to 10 years) and Senior (11 to 14 years). Data analysis was performed using SPSS (IBM, Chicago, Il.). Frequency distributions were produced. Pearson's chi square test with Cramer's V was used to as test of association. P value less than 0.05 was considered significant.

Results
A total of 3495 children aged between five to fourteen years presented from 2015 to 2018. Males (n=2039. 58.3%) were

higher than females (n=1456, 41.7%). Higher number of children presented from the junior group (n=2138, 61.2%) than the senior group (n=1357, 38.8%). Prevalence of mesiodens was noted in 0.6 % (n= 21) children. Age was significantly associated with the presence of mesiodens (χ (1) = 4.737, p=0.030) with higher number of seniors (n= 13, 1.00%) presenting prevalence of mesiodens than juniors (n=8, 0.40%). Similarly, gender was significantly associated with presence of mesiodens (χ (1) = 4.445, p=0.035) where higher number of males (n= 17, 0.80%) presented with mesiodens than females (n= 4, 0.30%). However, in both the analysis, the association was weak (φc =0.037 and φc =0.036, respectively).

Discussion

Prevalence of mesiodens was higher among males than females. The senior group were found to have significantly higher reported occurrence of mesiodens. The present study reports 0.6 % of children aged between five to fourteen have mesiodens with more males having mesiodens than females. Studies have reported a varying occurrence of mesiodens from 0.15% and 3.9% in some studies to 0.09 and 2.05% in general population [16-18]. In 80-90% of the cases it occurs in the maxilla and half of this percentage are found particularly in the anterior region [12, 15]. The male population is more prone to be affected as compared to the female population [19, 21] as has been noted in this study.

Studies conducted in India show occurrence of mesiodens in 3.18% in Indore children [22], 0.8% in Bengal children [23].

In the present study most of mesiodens (60 %) was found in age group of 10-14 years. This finding was in accordance with the literature [14, 22, 24, 25], although different study has reported a prevalence as low as 0.10% [26] This period is the eruption time of maxillary central incisors and the radiographic examination is performed as screening aid for congenitally missing teeth, supernumerary teeth, cysts, and tumors, when delay of eruption and apposition of maxillary central incisor is seen. It is therefore logical that most mesiodens are discovered in this period [24].

Conclusion

Mesiodens is the most prevalent form of supernumerary teeth in permanent dentition that occurs as a result of genetic and environmental factors and hyperactivity of dental lamina. Males are affected more than the females and it is most commonly seen in children aged between ten to fourteen years. Early diagnosis of a mesiodens reduces the treatment required and prevents development of associated problems.

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