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RESEARCH ARTICLE

PREVALENCE OF DEVELOPMENTAL DENTAL ANOMALIES AMONG SCHOOL GOING CHILDREN IN SOUTH BANGALORE OF THE AGE GROUP 6-14 YEARS

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ABSTRACT

Context: Developmental dental anomalies are routinely encountered by paediatric dental professionals at an early age. Their early detection, appropriate and timely management may help in an aesthetic and functional oral cavity.

Aim: The aim of this study was to determine the prevalence of various developmental dental anomalies like cusp of carabelli, microdontia, macrodontia, hypodontia, fusion, gemination, talon cusp, supernumerary and dens in dente in school going children in South Bangalore.

Material and methods: This cross-sectional study comprised 1500 children in the age group 6-14 years in South Bangalore. The children were examined and clinical data were collected by single dentist and tabulated accordingly. The Statistical data were collected tabulated accordingly by a single investigator and descriptive statistical methods were used using SPSS.

Result: The distribution of developmental dental anomalies was 36.84 % of the total population in the age group 6 -14 years residing in south Bangalore. The most prevalent anomaly was found to be cusp of carabelli 33.66%.

Conclusion: The prevalence of other anomalies seen were talon cusp, microdontia, macrodontia, hypodontia, supernumerary, fusion which was 0.93%, 0.73%, 0.66%, 0.4.5, 0.26%, 0.2% respectively. A knowledge of dental anomalies in each geographical area will point out towards the problems that could be faced by the respective population and thus interject their propagation to irreversible level.

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INTRODUCTION

The developing tooth is considered as a biological recorder providing a precise and permanent record of the variations and fluctuations in the tooth matrix and its mineralization. Disturbances during various stages of tooth development can markedly alter the number, size, shape, structure, color and eruption pattern of the teeth. These disturbances may also show wide normal and biological variations within and among different populations of the world (Javali and Meti, 2015). There are many types of developmental anomalies found in the teeth that occur during the morpho differentiation stage of development. The most common of these is malformations in the structure of enamel and dentine. Apart from these, there can also be anomalies in the size, number, and shape of teeth (Deolia *et al*., 2015).

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Factors responsible for the developmental disturbances are not just single but depends on various influences . Such influences may begin before or after birth, hence deciduous or permanent teeth may be affected (Guttal *et al*., 2010). The factors which cause developmental abnormalities can be either genetic like inheritance, metabolic and mutations or environmental factors including physical, chemical, environmental and biological factors or a combination of both. Dental morphological details are valuable for understanding variations among species and helps to gather information for phylogenetic and genetic studies. It is useful for collating and distinguishing population as there is varying degrees of expression of dental features (Kirthiga *et al*., 2015). Studies quantifying the prevalence of dental anomalies in different countries representing persons of various ethnic origin have been done (Nayak and Nayak, 2011). The identification of oral/dental and minor anomalies are of great importance for timely and accurate diagnosis of numerous genetic abnormalities of the craniofacial region (Kathariya, 2013). A study quantifying the prevalence of

dental anomalies in South Bangalore region has not been done so far. Therefore this study was conducted to determine the prevalence of developmental dental anomalies in 1500 school going children in south Bangalore.

MATERIALS AND METHODS

This cross sectional epidemiological study was conducted among 1500 school going children from the age group 6-14 years in South Bangalore. A total of four schools from the city were randomly selected for this study. Before scheduling the survey, the official permission was obtained from the Ethical Committee of Rajarajeswari dental college and hospital, Bangalore and also from the Heads of the Institutes where the survey was being conducted. Informed oral consent was obtained prior to examination of each subject. Healthy Children with no history of teeth missing as a result of caries, periodontal disturbances, and trauma/extraction were included in the study. Children with medical history such as Down's syndrome, ectodermal dysplasia, cleft lip and cleft palate were excluded from this study. All the subjects were made to sit on a chair under natural light for examination (Type III). A single examiner carried out the examination in a systematic manner using a plane mirror and a straight probe with no additional aid. The examination included assessments of the dental anomalies representing variations in tooth size, morphology, and number were recorded on a proforma.

The anomalies taken into consideration in this study were –

Cusp of carabelli: It is a distinctive morphological variant located on the mesiopalatal surface of the upper first permanent molars and upper second primary molars. The degree and expression of cusp of Carabelli can range from small ridge, pit, furrow or as a tubercle (Kirthiga *et al*., 2015).

Microdontia : It is the presence of teeth which are physically smaller than usual (Nayak and Nayak, 2011).

Macrodontia : It is the presence of teeth which is physically larger than usual (Nayak and Nayak, 2011).

Hypdontia : It denotes the lack of development of one or more teeth (Javali and Meti, 2015).

Fusion: It is union in dentin and/or enamel between two or more separately developed normal teeth (Kapdan *et al*., 2012). Gemination – It is incomplete division of a tooth germ (Kapdan *et al*., 2012).

Talons cusp: Defined as an uncommon dental anomaly manifesting as an accessory cusp like structure projecting from the lingual or facial surface surface of anterior teeth of either dentition (Hegde *et al*., 2010).

Supernumerary teeth: Defined as teeth additional to the normal dentition (Javali and Meti, 2015).

Dens in dente: This presents clinically as pit or fissure on the lingual surfaces of anterior teeth. The crown is almost always malformed if the coronal invagination is extensive (Guttal *et al*., 2010).

The Statistical data were collected, tabulated and descriptive statistical methods were used using SPSS version 18.

RESULTS

The study population composed of 1500 children out of which 829 were males and 671 were females. Among all the participants, 63.16% were free from any kind of dental anomaly.

Table 1. Prevalence of each anomaly in South Bangalore

Anomaly	Total no of children with anomaly	Prevalence of each anomaly
Cusp of carabelli	505	33.66%
Microdontia	11	0.73%
Macrodontia	10	0.66%
Hypodontia	6	0.4%
Fusion	3	0.2%
Gemination	0	0%
Talons cusp	14	0.93%
Supernumerary	4	0.26%
Dens in dente	0	0%

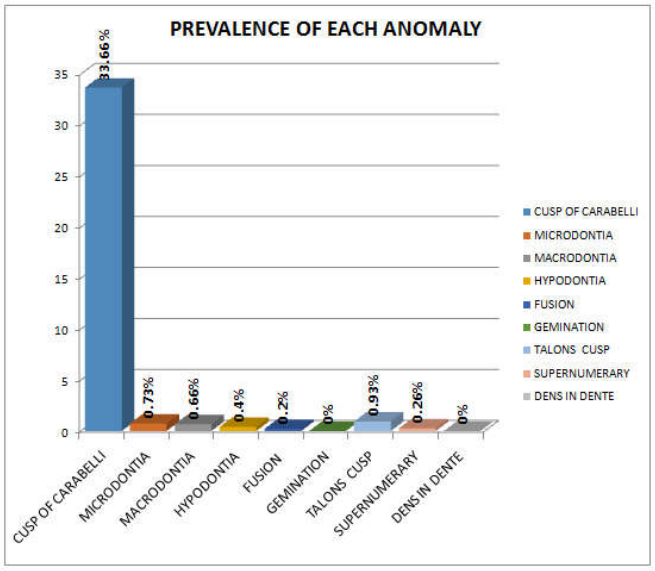

Fig. 1. Graphical representation of overall prevalence of each anomaly

Cusp of carabelli was the most common anomaly (33.66%) seen in this study and most of the were related to primary maxillary 2nd molar and permanent maxillary 1st molar. It was followed by presence of talons cusp which was found to be 0.93% and mainly seen in maxillary central and lateral incisors .The prevalence of microdontia was found to be more 0.73% than macrodontia which was found to be 0.66%. A total of 0.4% subjects had hypodontia and supernumerary teeth were seen among 0.26% and all cases seen in maxillary arch. Presences of double teeth were noted in the form of fusion (0.2%) whereas cases of gemination were found to be nil (0%).

DISCUSSION

Developmental dental anomalies are an important category of dental morphologic variations. They are marked by deviations from the normal color, contour, size, number and degree of development of teeth (Gupta *et al*., 2014). The present study is the first large scale to be conducted in South Bangalore to determine the prevalence of developmental dental anomalies in school going children in the age group 6-14 years. The total prevalence of developmental dental anomalies in the present study was found to be 36.84%. When comparison were made with previous epidimological studies Slight differences were

observed , these could be attributed to various to factors like racial difference, genetic factors, local environmental factors & nutrition. Moreover, India has diverse cultural and religious background that may also have an affect on the prevalence of dental anomalies (Deolia *et al*., 2015). In this study the most common anomaly prevalent was cusp of carbelli. Cusp of carabelli has an evolutionary and functional perspective. In the evolutionary perspective, it is considered as a primitive structure that tends to disappear with molar size reduction in all hominoid evolutionary lines and According to the functional perspective; it is a structure that resists excessive biomechanical stresses on the molar (Kamatham and Nuvvula, 2014). In the present study the prevalence of cusp of carbelli was found to be 33.66% , whereas, in a study conducted to estimate the expression of carabelli trait in south India showed 27.6% in primary molars, 30.7% in permanent first molars (Kamatham and Nuvvula, 2014).

Talon cusp was the second most common anomaly found in our study with a prevalence of 0.93%. The prevalence of talons cusp is low effecting less than 1% to approximately 8% (Hegde *et al*., 2010). The clinical problems associated with the presence of talon cusps include stagnation of the food, caries, periapical lesions, irritation of tongue during speech and mastication, other soft tissue irritation, compromised esthetics, occlusal interference which may lead to accidental cusp fracture, displacement of the affected tooth, temporomandibular joint pain and periodontal problems because of excessive occlusal force (Prabhu *et al*., 2012). In similar studies conducted in South India and Saudi Arabia showed a prevalence of 0.58% and 1.5% respectively (Prabhu *et al*., 2012), (Vani *et al*., 2015). However, a study conducted in North India showed a higher prevalence of 7.7% (Hegde *et al*., 2010). Microdontia is the presence of teeth which are physically smaller than usual (Nayak and Nayak, 2011). Prevalence of microdontia in present study was 0.73% and confirms to the prevalence suggested by other studies between 0.1% to 8.4% Deolia *et al*., 2015), (Javali and Meti, 2015). similar study conducted in India showed 0.64% (Deolia *et al*., 2015) which was comparable to the present study, however a higher prevalence of 4.3% were seen in a study conducted by (Kathariya *et al*., 2013).

Macrodontia is the prescence of teeth which is physically larger than usual (Nayak and Nayak, 2011). Macrodontia is very much less common than microdontia (Patil *et al*., 2013). Present study showed low prevalence of 0.66% which was in accordance with a study conducted in and Saudi Arabia , North karnataka, Texas -0.23% , 0.6% and 0.7% respectively (Javali and Meti, 2015), (Vani *et al*., 2015), (Sacal *et al*., 2001). Hypodontia denotes the lack of development of one or more teeth (Javali and Meti, 2015).Low Prevalence of 0.4% were seen in the present study which was similar to that conducted in Turkey and Jodhpur – 0.2 % and 0.6% respectively (Kapdan *et al*., 2012) (Deolia *et al*., 2015). However a much higher prevalence was noted in populations of North Karnataka, Toronto and Japan which was 3.23%, 7.4% and 8.5%. respectively(Javali and Meti, 2015), (Thompson and Popovich, 1974), (Endoa *et al*., 2006). Supernumerary teeth are defined as teeth additional to the normal dentition (Javali and Meti, 2015). The occurrence of supernumerary teeth is a less common finding than other developmental anomalies. Zhu *et al* reported the prevalence of supernumerary teeth with respect to race usual (Nayak and Nayak, 2011). Supernumerary teeth occur in 0.1 to 3.8 percent of different populations and appear to be on the rise. supernumerary teeth are often associated with delayed eruption or impaction of permanent teeth, early removal is recommended to facilitate the spontaneous eruption of impacted permanent teeth usual (Nayak and Nayak, 2011), (Sharma and Singh, 2012). The present study showed a prevalence of 0.26%. similar studies conducted in various regions of India showed prevalence of 0.36% ,0.6%,1.43% respectively (Deolia *et al*., 2015),(Nayak *et al*., 2011), (Javali and Meti, 2015). But, however significantly higher prevalence of 5.3% was seen in a study conducted (Kathariya *et al*., 2013) in India. Fusion also referred to as double teeth, formed as result of total or partial union in dentin and possibly their pulps (Guttal *et al*., 2010). The prevalence ranges from 0.03% to 4.8% (Javali and Meti, 2015). The present study showed a prevalence 0.2% which was within the range of previously done studies. Similar values were obtained from studies conducted in India and Romania with prevalence of 0.17% and 0.4% respectively (Javali and Meti, 2015), (Georgescu, 2015). However, higher prevalence was seen in a study conducted in India when compared to the present study which was 3 % (Kathariya *et al*., 2013).

Conclusion

Present study concluded that 36.84 % of the population in the age group 6 -14 years residing in south Bangalore had developmental dental anomalies. Their early detection is of utmost importance as it can interject the propagation to an irreversible condition thus maintaining a healthy and harmonious oral cavity. Combined efforts of dental professionals, school authorities, and parents will help in achieving the same and help seed better oral health importance at an early age.

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