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Prevalence Of Structural Deformities Of Teeth: A Retrospective Study

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Abstract

Developmental anomalies and structural defects are commonly seen in individual teeth as a consequence of genetic or infectious factors, vitamin deficiency diseases, or certain medications. The aim of this study was to study the prevalence of dental anomalies. Materials and Methods The data was collected from the dental hospital management system. The data collected was tabulated under following parameters : Age, gender, structural abnormalities . The independent variable includes age, gender and dependent variables includes structural abnormalities and associated anomalies. Results: The study included details of 25 patients who underwent full mouth rehabilitation. Out of 25 patients it was observed that amelogenesis imperfect a(68%) was the most common structural deformity seen in both males and females of all age groups (Figure 1). It was observed that males(64%) were more commonly affected with structural abnormalities compared to females(16%) In correlation with structural abnormality and age, In correlation with gender and structural abnormalities, it was observed that 11 males(44%) and 6 females(24%) were affected with amelogenesis imperfecta, 3 males(12%) and 2 females(8%) were affected with dentinogenesis imperfecta and 2 males(8%) and 1 female(4%) were affected with fluorosis. Conclusion Within the study limits, it is concluded that amelogenesis imperfecta was the most common structural deformity seen in all the age groups. There was no statistically significant value in correlation between gender and structural deformities.

Keywords Developmental anomalies, amelogenesis imperfecta, fluorosis, dentinogenesis imperfecta.

Introduction

The tooth is the specialized part of the human body. Humans have 2 sets of teeth, the primary dentition followed by the permanent dentition.The development of primary dentition usually takes place between

the 13th and 16th weeks of gestation for incisors and between the 14th and 24th weeks for canines and molars.[1] Mineralization of the enamel surface is usually complete by the end of the first year of life and root development by 12 to 18 months after eruption. The permanent dentition begins to form in utero, and mineralization is usually complete by age 4 or 5 and root development by 2 to 3 years after eruption.[2]

Developmental anomalies and structural defects are commonly seen in individual teeth as a consequence of genetic or infectious factors, vitamin deficiency diseases, or certain medications. The dental development takes place over a period of (from the fifth week of embryonic life through to the age of 16 years), during which time many events may intervene directly or indirectly in this process, the teeth show traces of disorders and structural defects.[3] The defects are structural flaws, deviations in tooth size and shape, and abnormal numbers of teeth. The effect of dental anomalies may lead to functional, esthetic and occlusal problems. The factors causing the developmental abnormalities can be either genetic factors such as inheritance, metabolic and mutations or environmental factors including physical, chemical, environmental and biological factors. Abnormalities in tooth development are mainly caused by complex disturbances that occurs during early stage of embryonic development.[4]

Dysplasias of dental hard tissue (defective development or underdevelopment) affecting dentin and enamel is seen before eruption of the teeth and are relatively common.[5] These defects are less frequently seen in the primary teeth than in the permanent dentition. Enamel hypoplasias disturb the tooth shape so that furrows, pits, convolutions, and jagged cusps are formed. These features are accompanied by discoloration of the enamel layers, such as whitish or yellowish spots.[6] Enamel hypoplasia is caused by the disturbance of the cellular activity of ameloblasts.[1] As the ameloblasts are unable to divide and therefore cannot be replaced, the degree of malformation depends on whether the cells were damaged or killed.[7] Damage to primary teeth, caused by the effects of impact during childhood or inflammation of the roots of the primary teeth, can lead to changes of shape and color in the enamel of the successive teeth. This study mainly focuses on the prevalence of structural deformities of the teeth in patients reporting to Saveetha dental college and hospitals. Our team has extensive knowledge and research experience that has translate into high quality publications[8],[9],[10],[11],[12],[13],[14],[15],[16–21],[22–26],[27]

The aim of this study was to study the prevalence of dental anomalies.

Materials and methods
It was a single centered retrospective study conducted in a private dental institution, Chennai. The data was collected from the dental hospital management system. Ethical clearance for this study was obtained from the Institutional review board.

The data included a varied population predominantly south Indian. All the details of the patients from july 2019 to feb 2021 were collected . All the case sheets were reviewed and were cross verified by another examiner. The internal validity included diagnosed cases as per criteria, medical history , chief complaints and clinical findings. Inclusion criteria includes patients above age of 18 and patients who

underwent full mouth rehabilitation due to structural abnormalities. Exclusion criteria includes presence of systemic disorders.

The data collected was tabulated under following parameters : Age, gender, structural abnormalities . The independent variable includes age, gender and dependent variables includes structural abnormalities and associated anomalies.The data analysis was performed using SPSS software of version 19. The chi square test and pearson correlation was done . p value < 0.05 was considered statistically significant.

Results

The study included details of 25 patients who underwent full mouth rehabilitation. Out of 25 patients it was observed that amelogenesis imperfecta(68%) was the most common structural deformity seen in both males and females of all age groups (Figure 1). It was observed that males(64%) were more commonly affected with structural abnormalities compared to females(16%) (Figure 2).

In correlation with age and structural abnormalities, it was observed that in the 19-30 years of age group 1 patient(4%) was affected with amelogenesis imperfecta, 1 patient(4%) was affected with dentinogenesis imperfecta and 1 patient(4%) was affected with fluorosis. In the 31-40 years age group 2 patients(8%) were affected with amelogenesis imperfecta and 1 patient(4%) was affected with fluorosis. In the age group of 41-50 years 2 patients(8%) were affected with dentinogenesis imperfecta. In the age group of 51-60 years 5 patients(20%) were affected with amelogenesis imperfecta and 2 patients(8%) were affected with dentinogenesis imperfecta. In the age group of 61-70 years 9 patients(36%) were affected with amelogenesis imperfecta and 1 patient(4%) was affected with fluorosis (Figure 3). The chi square value was 0.05 which was statistically significant.

In correlation with structural abnormality and age, In correlation with gender and structural abnormalities, it was observed that 11 males(44%) and 6 females(24%) were affected with amelogenesis imperfecta, 3 males(12%) and 2 females(8%) were affected with dentinogenesis imperfecta and 2 males(8%) and 1 female(4%) were affected with fluorosis (Figure 4). The chi square value was 0.97 which was not statistically significant.
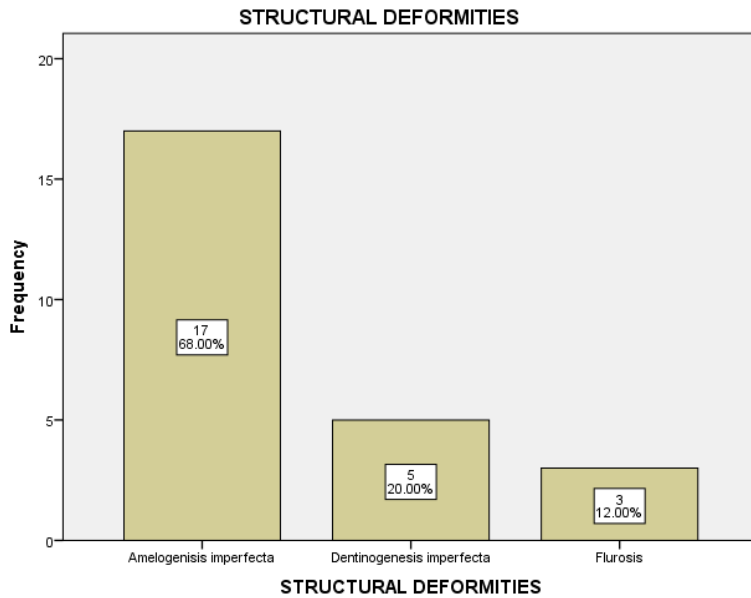
Figure 1. Bar graph showing prevalence of structural deformities. The X axis represents the structural deformities and the Y axis represents the frequency. There is a predominance of amelogenesis imperfecta.
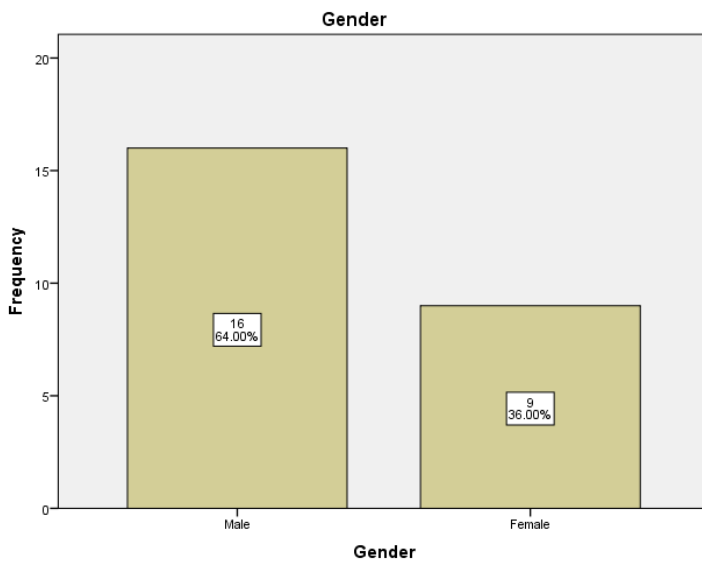
Figure 2. Bar graph showing prevalence of structural deformities. The X axis represents the gender and the Y axis represents the frequency. There is a male predominance by 64%.
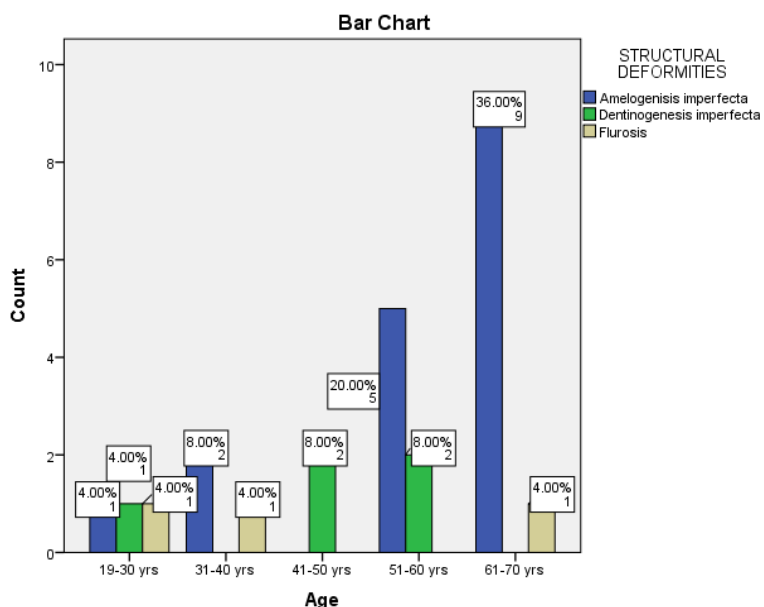
Figure 3. Bar graph showing correlation between age and structural deformity. The x axis represents the age group and the y axis represents the number of patients. The blue colour represents amelogenesis imperfecta, the green colour represents dentinogenesis imperfecta and light brown represents fluorosis.
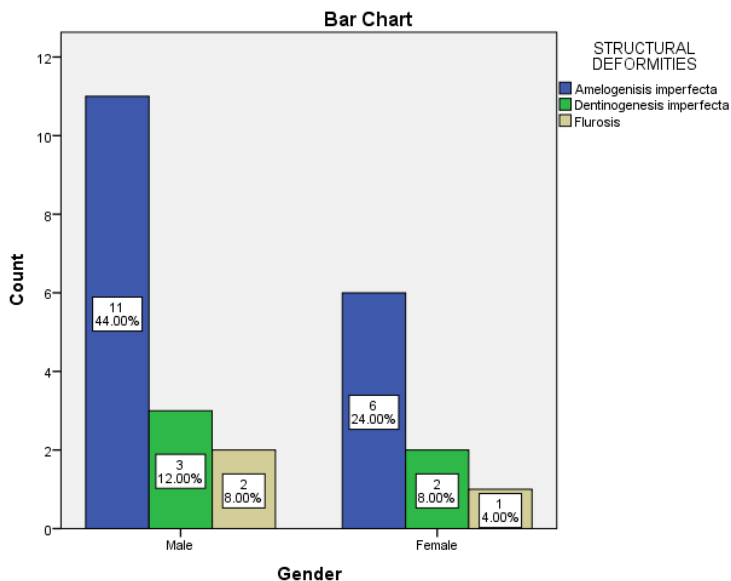
Figure 4. Bar graph showing correlation between gender and structural deformity. The x axis represents the age group and the y axis represents the number of patients. The blue colour represents amelogenesis imperfecta, the green colour represents dentinogenesis imperfecta and light brown represents fluorosis.

Discussion.

Dental anomalies area common finding in routine dental examination. The Presence of dental anomalies can lead to functional, esthetic and occlusal problems. Detailed investigation of dental anomalies is essential to prevent malocclusion, cosmetic deformities, periodontal problems, caries, and difficulties during tooth extraction and root canal treatment. In addition to clinical examinations, radiographic investigations play an important role in the differential diagnoses of these anomalies. Enamel hypoplasia can affect children and adolescents in a variety of ways, including aesthetics, function, and psychosocial impacts. By removing dental sensitivity and enhancing patient smile are part of the aims of the treatment, where colour adjustment is the most important factor.

In the current study it was observed that Amelogenesis imperfecta was the most common structural abnormality followed by dentinogenesis imperfecta. The prevalence rate of Amelogenesis imperfecta was 0.3% while only one case of Dentinogenesis imperfecta was seen in the study, Gupta et al.,.[28] In the study conducted by Ilankizhai R,J et al., it was shown that the most common reasons which were reported to cause generalised tooth surface loss which leads to full mouth rehabilitation were attrition, multiple missing teeth, multiple decay and other dental deformities such as amelogenesis imperfecta.[29]

In this study correlation with gender and structural abnormality was statistically insignificant and in the study conducted by Jose R et al.showed no difference by gender were identified for any of the studied dental anomalies.[30] The limitations of the study include small sample size over a short duration of time. This study would help in further research in future on prevalence and distribution of structural deformities of teeth.

Conclusion

Within the study limits, it is concluded that amelogenesis imperfecta was the most common structural deformity seen in all the age groups. There was no statistically significant value in correlation between gender and structural deformities.

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