Prevalence of early loss of primary teeth in 5–10-year-old school children in Chidambaram town

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Abstract
Introduction: The premature loss of primary teeth may reduce arch length required for the succeeding tooth and, hence, predisposes crowding, rotation and impaction of the permanent teeth. There are only limited studies carried out about the prevalence of early loss of primary teeth. Aim: The present study was performed to evaluate the prevalence of early loss of primary teeth in school children in Chidambaram town in Tamilnadu, India. Settings and Design: A total of 1121 school children (561 boys and 560 girls) between 5 and 10 years of age were selected for the study. Materials and Methods: An experienced examiner performed all clinical examinations under natural light. Data including age and missing tooth was collected. Statistical Analysis Used: Microsoft Excel/2000 (Microsoft Office XP) data spreadsheet was used and later exported to the Statistical Package for Social Science (SPSS) for Windows (version 10.0). Descriptive statistics was applied and, from the results, chi-square tests were applied at a level of significance of 5% ($P < 0.05$). Results and Conclusions: The results showed that 16.5% of the sample had early loss of primary teeth, but no differences were observed between genders ($P > 0.05$). The greatest prevalence was found among the 8-year olds (5.08%), and the most commonly missing teeth were the right lower primary first molars (16.82%). It can be concluded that the prevalence of early loss was high and that the lower primary molars were the most commonly missing teeth in the present study.

Keywords: Dental caries, early loss, malocclusion, prevalence

Introduction
Premature tooth loss of the primary teeth, especially the molars, may lead to lack of space, malocclusion and midline discrepancies in the permanent dentition.[1] The dental injuries and periodontal illness greatly influence the occurrence of tooth loss, but the decay continues to be the main villain of the high rate of loss.[2] Premature loss of primary teeth reduces the arch length required for the succeeding tooth and, hence, predisposes crowding, rotation and impaction of the permanent teeth.[3] The present study was idealized for evaluating the prevalence of early loss of primary teeth in 5–10-year-old school children.

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Materials and Methods
The present study was conducted to assess the prevalence of early loss of primary teeth. Before the study, a letter of permission to examine the school children was given to the concerned head of the schools and permission was obtained. Children with systemic disease and uncooperative behavior were excluded from the study.[1] The study population included 1121 (561 boys and 560 girls) school children at an age of 5–10 years in Chidambaram town. Examination of the children was performed by a single examiner and the survey form was filled by a trained dentist.

Early loss was classified according to the chronological table of eruption of the permanent tooth proposed by Kronfeld[4] and decreasing 12 months as proposed by Cardoso et al.[3] All the related data were entered in the survey form. Intra oral photographs of missing teeth were taken [Figure 1]. Alginate Impressions of study population with missing teeth were taken and diagnostic casts were prepared [Figure 2]. The acquired data were subjected to statistical analysis. Microsoft Excel/2000 (Microsoft Office XP) data spreadsheet was used and later exported to the Statistical Package for Social Science (SPSS) for Windows (version 10.0). Descriptive statistics was applied and, from the results, chi-square tests were applied at a level of significance of 5% ($P < 0.05$).

Results
Distribution of the cases of early loss of primary molars according to the age shows that there was a larger loss...
Prevalence among the 8-year olds (5.08%). A total of 333 teeth were lost early. The tooth with highest loss prevalence was 84 (mandibular right first primary molar) with 16.82% of the total, followed by 54 (mandibular right first molar) with 15.32% of the cases. Regarding the number of primary teeth, 101 (9.00%) children had one tooth lost, 37 (3.30%) children had two teeth lost, 34 (3.03%) children had three teeth lost, nine (0.80%) had four teeth lost and four (0.35%) children had five teeth lost. Majority of the reason for early loss of primary teeth was extraction due to caries. Among 333 teeth lost, only five teeth (incisors) were lost by trauma. The result was statistically significant ($P = 0.000$) [Tables 1-4].

**Discussion**

Early loss of primary teeth has been evidenced during research in many areas around the world. The study population in the present study comprised screening of 1121 school children in Chidambaram town, which included 561 (50.04%) male children and 560 (49.95%) female children. In the present study, the prevalence of early loss of primary teeth was found in 185 children who showed a percentage of 16.5, of which 104 (9.28%) were males and 81 (7.22%) were females. These findings were similar to those found by Alessandro Leite Cavalcanti et al. The prevalence of the early loss of primary teeth in the present study might be due to the fact that many practitioners elect to extract primary teeth than trying to salvage them. It might also be due to the fact that parents do not care about primary teeth because they have an idea that primary teeth will be replaced. The results showed that male children (56.22%) had a higher prevalence of early loss when compared with the females (43.78%). The reason for more primary tooth loss in males might be because of more dmft scores in boys due to marked preference for sons regardless of socioeconomic class, which manifested itself in the longer feeding of sons compared with daughters. Mahejabeen et al. in their study have quoted that the increased dmft scores in male children could be attributed to diet, geographic location and cultural differences seen in the Indian society, where males are given priority.

Largest percentage of early dental losses occurred in the age
of 8 years, followed by 7 and 9 years in the present study. The tooth most commonly affected by early loss was 84 (lower right first primary molar), with 56 (16.82%) teeth lost. This finding of the present study was similar to the study done by Alessandro Leite Cavalcanti et al. [3] and Najia Alamoudi. [1] This was followed by 54 (upper right first primary molar). Primary molars had more premature loss than the other primary teeth. This might be due to the reason that the prevalence of mutans Streptococci acquisition by infants increases with age or as the number of emerged teeth increases. The primary molars may be particularly critical for initial mutans Streptococci colonization, because they emerge into the oral cavity between 16 and 29 months of age and possess both fissured occlusal surfaces and concave approximal surfaces. Occlusal fissures were more readily colonized by mutans Streptococci than smooth surfaces. [10] This might result in caries of the primary molars, which, if not treated, might result in extraction of primary molars resulting in early loss.

The prevalence of early loss was higher in the first molars when compared with the second molars in the present study. This was similar to the findings of Najia Alamoudi. [1] The reason for this might be due to the difference in the chronological age between the first and second primary molars, where the first primary molar erupted before the second primary molar and therefore it had been present in the oral environment for a longer period than the second primary molar. It also might be from a clinical point of view; while many clinicians would endeavor to restore a grossly carious second primary molar in order to maintain space, especially before the eruption of the first permanent molars, the first primary molars were usually extracted in such cases as the success rate of endodontics, which was the alternative treatment, was considerably lower. [11] A larger prevalence was observed in the mandibular arch when compared with the maxillary arch. These findings were similar to that of the findings of Alessandro Leite Cavalcanti et al. [3] and Natalie Kelner et al. [6] The greater loss of primary molars in the mandibular arch might be due to food packing potential and greater plaque accumulation in the mandibular posterior region in contrast to the relative abundance of saliva and its anticarious effect to maxillary molar teeth. [7] The children had more number of teeth lost in the right side when compared with the left side in the present study. The reason for more teeth missing in the right side in the present study could be attributed to the possibility of greater attention being paid to the left sides of both jaws during oral prophylactic procedures and masticatory processes. The tendency for higher deposition of plaque on those teeth in the less frequently cleaned and used sides of the jaws might be due to lack of shearing occlusal and tooth brushing forces, which were very important in the mechanical removal of plaque. Therefore, a higher prevalence of tooth decay on the right sides of the jaws could be a reflection of a lower level of tooth cleanliness. [11] Hence, due to the cause of neglecting decay formed in the teeth, gross caries leading to extraction of the teeth prematurely in the right side is seen.

Majority of the primary teeth were extracted due to dental caries, followed by the reason of trauma. This showed a statistically significant result in the present study (P-value = 0.0000). After completion of screening in each school, oral hygiene instructions were given to the children, including the consequences of early loss of primary teeth. Pamphlets containing knowledge about the importance of primary teeth and their preservation were distributed to teachers and parents/guardians. Because of the deleterious effect of early loss of primary teeth, it becomes mandatory to increase the oral health awareness by conducting school dental health programs, making the children and their parents realize the deleterious effect caused by the early loss of primary teeth. Thus, they should be made to have a clear knowledge about the value of the primary teeth so that they do not ignore in paying attention to preserve them. The children with early loss of primary teeth should be instructed to have space maintainers if necessary. The parents of those children should be advised to bring their children to the dental hospital for the procedures to be done.

Conclusion

From the present study, the following conclusions could be drawn:

- Prevalence of early loss of primary teeth was 16.5%, and boys had more primary teeth lost (9.28%) than girls (7.22%).
- Prevalence of early loss of primary teeth was higher at 8 years of age.
- Lower right first primary molars were most commonly affected by early loss and first primary molars had more prevalence of early loss with 201 teeth (60.36%).
- More number of teeth was lost in the mandible when compared with the maxilla.
- More number of teeth was lost in the right side when compared with the left.
- Majority of the children had loss of single tooth only, and dental caries was the main reason for early loss of primary teeth followed by trauma, which was statistically significant (P = 0.0000).

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