

**INFLUENCE OF MAXILLARY FRENUM IN THE DEVELOPMENT OF  
DENTAL CARIES IN PRIMARY ANTERIOR TEETH****P.S. SUBIKSHA<sup>\*1</sup> AND DR. G. DEEPA<sup>2</sup>**<sup>1</sup>*under graduate student, saveetha dental college*<sup>2</sup>*reader, department of pedodontics, saveetha dental college***ABSTRACT**

The aim of the study is to evaluate the influence of maxillary frenal influence on the development of dental caries in primary anterior teeth. **BACKGROUND:** The maxillary labial frenum is a fold of the mucous membrane connecting the lip to the alveolar process. The maxillary frenum often attaches to the centre of the upper lip and between the upper two front teeth. Incidences of improper attachment of the frenum are a common problem occurring in children than in adults. This study involves 200 healthy patients aged between 3-6yrs who have come to Saveetha dental college for dental checkup. This is a questionnaire based study on the type of frenal attachment and clinical examination of presence and extent of caries in primary anterior teeth. **RESULT** It is seen in this study that 125 out of 200 children had dental caries in their primary anterior teeth. The type of frenum attachment which is associated with the development of caries in anterior teeth is type 3. In children an abnormal attachment of maxillary frenum has the potential to become a significant factor in contributing to caries formation on the maxillary anterior teeth. This may be due to the inability of infants to remove residual milk from the area between the lip and facial surfaces of the maxillary central and lateral incisors at the completion of nursing.

**KEYWORDS:** maxillary frenum, dental caries, infant development.**P.S. SUBIKSHA**

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## INTRODUCTION

The maxillary labial frenum is a fold of the mucous membrane connecting the lip to the alveolar process. It consists mainly of connective tissue and epithelium, with some nerve fibers. Elastic and collagen fibers are found to traverse the entire length of the frenum, originating in the periosteum, which covers the anterior maxillary alveolus. The anterior frenum is a combination of epithelium and loose connective tissue<sup>1</sup>. In some instances, frenum may include muscle fibres originating from the orbicularis oris muscle of the upper lip<sup>2</sup>. There are different type of classification of the labial frenum. The one introduced by Placek and kotlow<sup>3</sup> is a morphological-functional classification of the type of the labial frenum attachment, aiming to help clinicians identify functional problems that require intervention. The four types of frenum attachment are defined as mucosal, gingival, papillary, and papillary penetrating, depending on whether the attachment is located in the mucogingival junction, the attached gingiva, the interdental papilla, and through the interdental papilla right up to the palate, accordingly. In some instances the frenum may be completely absent. The labial frenum is a dynamic and changeable structure<sup>4</sup> and is subject to variation in shape, size, and position during the different stages of growth and development<sup>5</sup>. Future problems that may develop in which the maxillary labial frenum may be a contributing factor includes: dental decay on the upper front teeth, diastema between the two front teeth, orthodontic or periodontal problems later in the child's oral development, poor lip mobility or function, especially during smiling and speaking<sup>6</sup>. The maxillary labial frenum restrictions may occur by themselves or in conjunction with tongue-ties and can easily be revised. Dental caries of the maxillary anterior teeth in the primary dentition like nursing caries, baby bottle tooth decay, bottle caries is most often due to the

inappropriate or prolonged use of a nursing bottle filled with milk or sweetened liquids. Inappropriate bottle use may include at-will feeding practices or allowing an infant to sleep with a bottle. Behavioral factors, such as lack of parental knowledge of proper dental health practices and lack of confidence to perform these practices, may contribute to the problem<sup>7</sup>. The purpose of this study is to evaluate maxillary frenum attachment as a contributing cause of facial caries development in primary anterior teeth

## MATERIALS AND METHODS

### Sample

The present study was designed to be an observational study supported by a formulated questionnaire for finding the type of frenal attachment and the presence of caries in primary anterior teeth. An ethical approval was obtained from the ethical committee of the institution. The participants for the study were healthy children who visited Saveetha dental college for dental check-up. The study was carried out from November 2014 to May 2015. Examination was carried out by a single well trained and calibrated examiner. During this period of the study, 200 children of the age group 3-6yrs were approached. Data was collected by a single investigator. The study had two parts including clinical examination of children followed by a questionnaire which was given to the parent to find out the feeding habit of their child.. The study was initially started by distributing a written consent to the parents of the child to be examined. Hard tissue examination of the child was done using a Mouth mirror and probe under natural light. The type of frenum attachment was examined following the classification which was given by Placek and Kotlow<sup>[3]</sup>.

### *The questionnaire was as follows*

#### **Survey on the influence of maxillary frenum in the development of dental caries in anterior teeth**

Proforma

Patients name:

Age : Sex:

Intra oral examination

Hard tissue examination

Missing teeth:

Decayed teeth:

Type of frenum attachment:

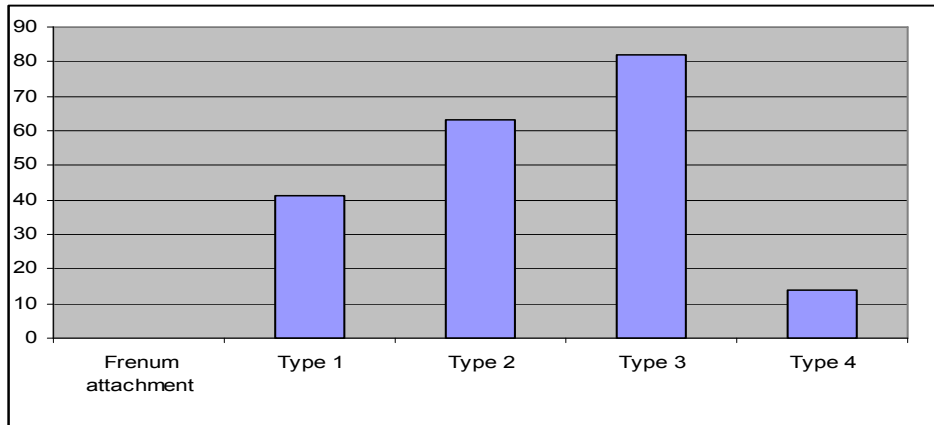
The data obtained from 200 questionnaire and clinical examination were tabulated and statistical analyses was done using SPSS version. While P 0.5 value was considered to be significant, the chi-square test was applied to investigate the association between the results and the genders, pattern of feedind and the frenum attachment.

## RESULT

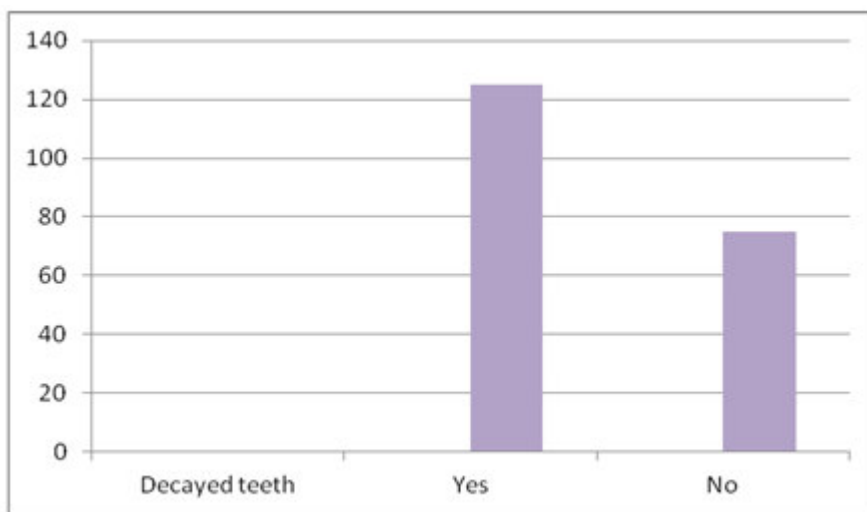
200 children with mean age of 5.34 were involved in the study. 63 children have Type 2 frenal attachment and 82 children have Type 3 frenal attachment (graph

1). 125 children have presented with caries in primary anterior teeth, 29 children have been presented with missing teeth, 80 children have been presented with filled teeth.

**Graph 1**  
**Types of frenum attachment present in children**



**Graph 2**  
**Percentage of decayed tooth in children**



## DISCUSSION

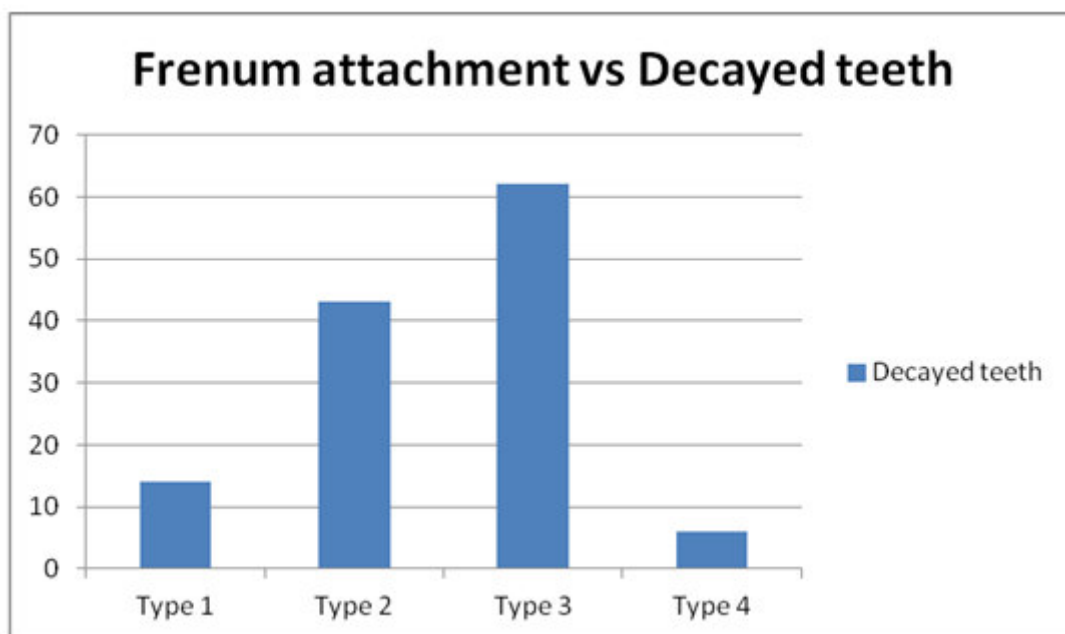
Early Childhood Caries (ECC) is the term adopted in 1994 to denote dental caries in infants and preschool children, however, there was no universally accepted definition and criteria for the diagnosis of ECC. Dental caries is one of the most prevalent diseases in children worldwide. Although the prevalence of caries in developed countries is actually declining mainly because of the wide spread use of fluorides, there still remains a subgroup of susceptible children at high risk of caries. Of many factors contributing to development of dental caries, nutrition and diet plays an important role. It is well known that frequent consumption of sugar-containing foods increases the risk of dental caries. Anterior teeth of the primary dentition are the first teeth to erupt and are immediately susceptible to carious attack if a child has an inappropriate nursing habit and is infected with cariogenic micro-organisms<sup>[8]</sup>. It has been suggested that children with caries of maxillary anterior primary teeth may have increased caries incidence in other teeth. The pattern of decay seen in baby bottle caries presents as lingual caries on the upper central and lateral incisors, followed by decay of the upper first molars. The primary canines and second primary molars usually do

not erupt until after 14 to 16 months of age and thus are spared the effects of sleeping or resting with a baby bottle. Based on the study, it shows that the presence of caries is due to the inability of an infant to remove residual milk from the area between the lip and facial surfaces of the maxillary central and lateral incisors at the completion of nursing<sup>[9]</sup>. A nursing mother should be cautious and practice good oral hygiene in the infant after the upper front teeth erupt, making sure no residual milk remains in contact with the facial surfaces of the infant's teeth on completion of nursing. If a parent sees any signs of enamel decalcification, white spots, or discoloration developing, a visit to a dentist should occur followed by any needed corrective care. This study aims to investigate the type of frenal attachment and development of caries in primary anterior teeth. According to the study done by Lawrence A. Kotlow<sup>6</sup>, type 3 and type 4 frenum attachment in a nursing infant has the potential to create dental caries if the upper lip is abnormally restricted and forms a pocket to trap retained milk on completion of nursing. The possibility of caries development increases when a thick fibrous attachment limits the normal function and mobility of the upper lip. In our study it was reported that type 2 and 3 frenum attachment in a nursing

infant has the potential to create dental caries(Graph 1) if the upper lip is abnormally restricted and forms a pocket to trap retained milk on completion of nursing while in the previous study it was mainly dependent on class 3 and 4 frenum attachment. The difference between the two studies is that, the previous study was mainly based on younger children starting from birth till age of 3yrs while in our study its between the age limits of 3-6yrs. The possibility of caries development increases when a thick fibrous attachment limits the normal function and mobility of the upper lip. In this study it is seen that there is a higher prevalence of caries in the primary maxillary anterior teeth. This is associated with the maxillary frenal attachment. There are four types of frenal attachment observed in children. In this study most of the children were presented with type 3 frenal attachment which is a papillary type of frenal attachment. The frenum is attached to the papilla and this results in the collection of the residual milk in between the gingival and the maxillary anterior teeth. The milk is retained and further leads to the

development of caries in the primary anterior teeth. In our study, about 125 children were found to have caries in the primary anterior teeth.(Graph 2) This is the first study done to find out the influence of maxillary frenum in the development of caries in primary anterior teeth in children. In this study more than fifty percent of the children showed presence of primary anterior caries which might later lead to increased risk of caries in posterior teeth. Reports shows that there was an increased number of caries in children also with type 2 and type 3 frenum attachment. In the previous study it was said that development of caries in anterior teeth was mainly associated with type 3 and type 4 frenum attachment. This study cannot be compared with a previous study done by Lawrence A. Kotlow<sup>5</sup>, as it was done in infants of younger age groups while this study is done in children 3-6 years of age. Increased number of caries with especially type 3 frenal attachment of about forty one percentage was reported high in our study.(Graph 3)

Graph 3  
Co-relation between frenum attachment and decayed teeth in children



This problem can be minimised by correcting the defect in the frenum attachment either surgically by performing frenectomy, by undergoing orthodontic treatment or by educating the mothers in prevention of caries in primary anterior teeth.

## CONCLUSION

The result of this study concluded that, Common type of frenum attachment is type 3 frenum attachment. There is an increased in caries in primary anterior teeth with type 3 frenum attachment.

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