

Introduction

Dental caries is one of the most prevalent chronic diseases in children around the world and it is an international public health problem affecting 60–90% of school children. Early detection of dental caries is of extreme importance to allow for implementation of appropriate prevention protocols and the avoidance of early treatment in the pediatric population. Recognizing children at risk to develop dental caries is extremely important since the literature has shown that dental caries in the primary dentition can be correlated to the incidence of dental caries in the permanent dentition. Many researchers have concluded that caries distribution in the primary dentition follows a typical pattern. Multiple investigations have shown that second primary molars are more frequently affected with caries and that the most commonly affected area is the occlusal surface. In light of this evidences, only one study measured the prevalence of dental caries among five zones of occlusal surfaces of posterior teeth in children 7-12 years of age. This study revealed that when the occlusal surface was divided into five zones, it appeared that the distribution of dental caries over the occlusal surface of the primary and permanent molars followed a different pattern. Based on the existing literature, there is still a lack of information about the occurrence and distribution of occlusal dental caries (i.e.: mesial, central, distal, lingual, buccal) in primary molars in children 3-5 years of age, and whether there are other factors such as tooth location and gender associated with it. The purpose of the present study was to determine the prevalence and distribution of dental caries in five zones of the occlusal surfaces of primary molars in children 3-5 years of age.

Materials & Methods

This retrospective cross-sectional study used data from the dental screening performed in children from the head start program and pre-school Newark School System. Both male and female cooperative/healthy preschool children 3-5 years old were included in the study. Uncooperative children who could not tolerate the dental examination, or with intellectual disabilities, chronic diseases, and pharmacotherapy likely to affect dental health, were excluded from the study. Parental consent was obtained prior to performing the dental clinical examination. IRB approval was obtained for this study (Study ID : Pro 2022001070). The data from 143 preschool children was obtained in three consecutive months during the school year of 2019. The data was collected and analyzed at Rutgers School of Dental Medicine, Pediatric Dental Clinics. Caries detection was performed using the International Caries Detection System (ICDAS II). Clinical dental examinations were done by 3 calibrated examiners. A Kappa agreement of 80% or higher among all examiners was expected before the initiation of the study. The occlusal surfaces of all primary molars were divided into five zones (mesial, distal, buccal, lingual, and central)(Figure-1), and each zone was examined for dental caries. Following the ICDAS guidelines, two digit codes for each affected surface were used, with the first digit indicating if the tooth was restored or sealed, while the second digit represents the severity of the carious lesion. The prevalence of dental caries was determined based on the following criteria: 1) Total caries, 2) Caries in enamel only, and 3) Caries in dentin.

Figures

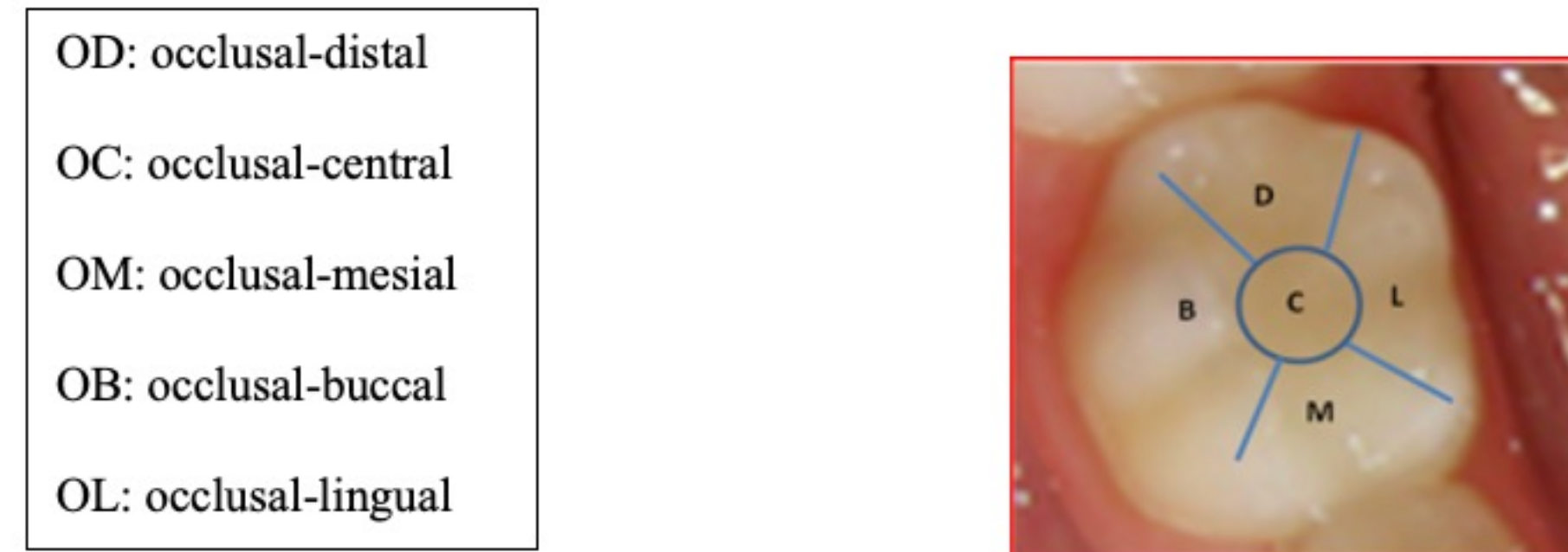


Figure 1 Visual Representation Of The Five Occlusal Zones Examined

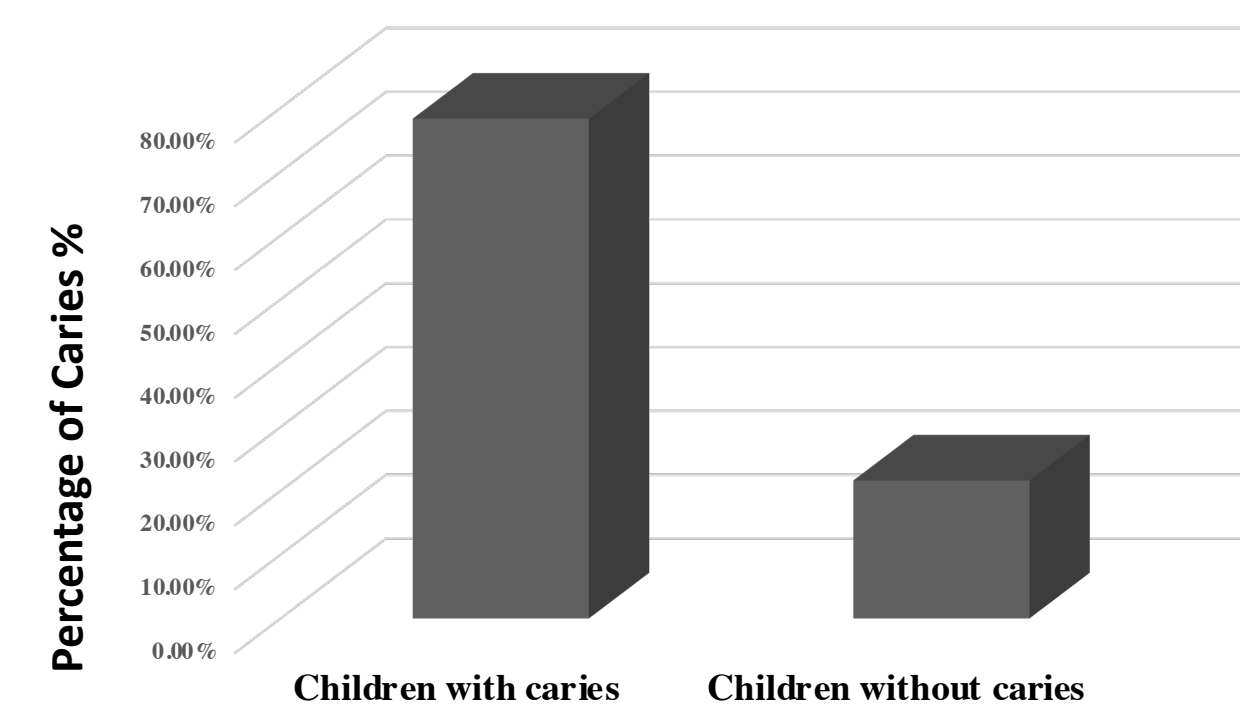


Figure 2. Prevalence of Dental Caries in Pre-school Children

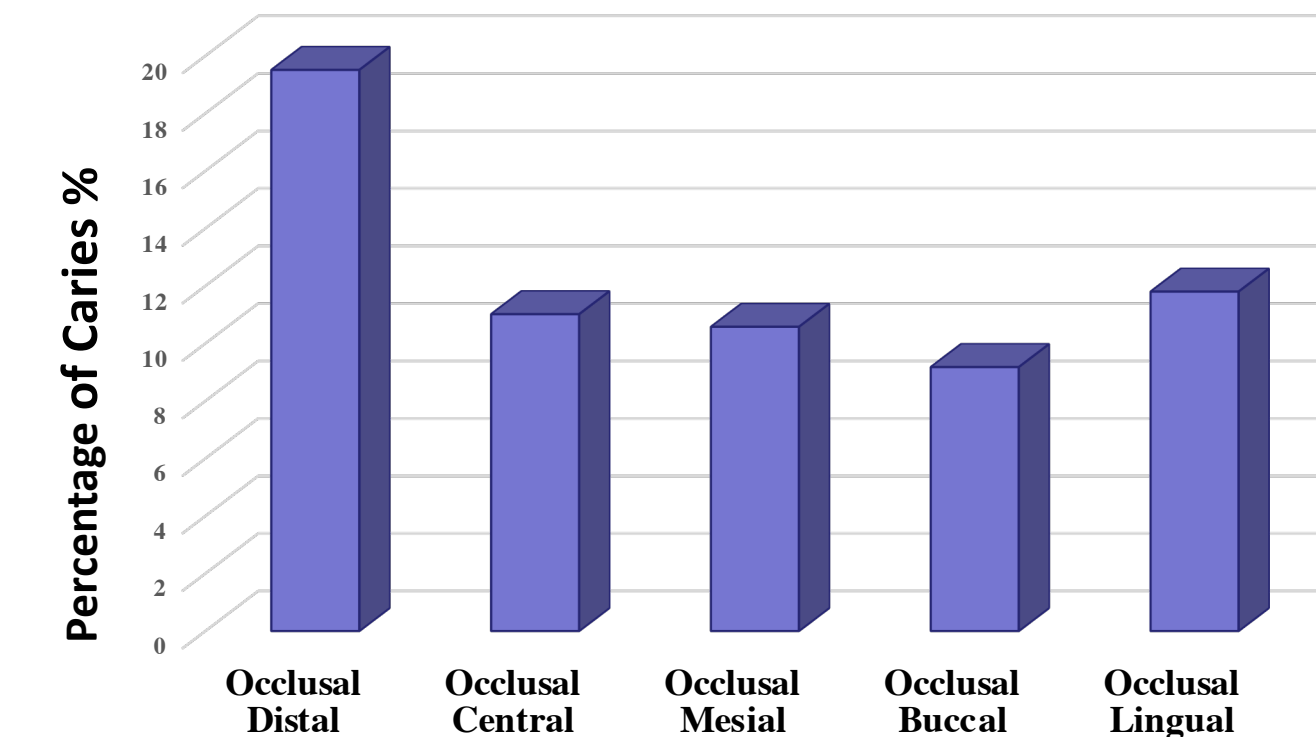


Figure 3. Total Caries

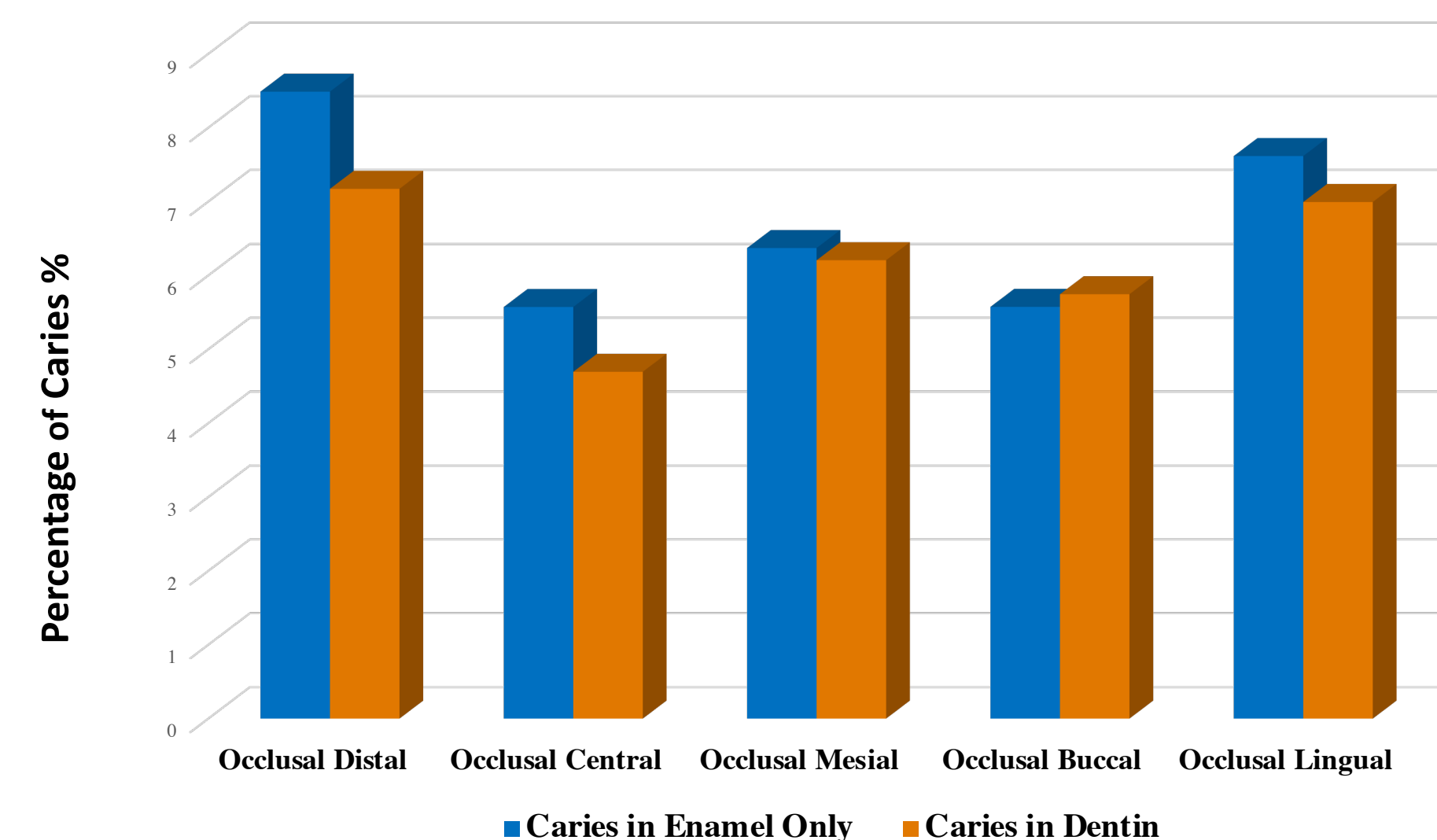


Figure 4 Prevalence of Caries in Enamel Only and Dentin

Results

The prevalence of dental caries in preschool children aged 3-5 years old was 78.3% (Figure 2).

Prevalence of Dental Caries in Each of the Five Occlusal Zones was:

1- Total caries (caries in enamel and/or caries in dentin) :

The occlusal-distal zone showed the highest prevalence of dental caries (19.5%), followed by the occlusal-lingual (11.8%), the occlusal-central zone (11.01%), occlusal mesial zone (10.57%) and the buccal zone (9.17%) (Figure 3).

2- Caries in Enamel Only (caries involving enamel only):

The occlusal-distal zone showed the highest prevalence of dental caries (11.82%). Followed by the occlusal-lingual (7.85%), the occlusal-mesial zone (7.6%), occlusal central zone (6.82%) and the buccal zone (6.1%) (Figure 4).

3- Caries in Dentin (caries extending to dentin):

The occlusal-distal zone showed the highest prevalence of dental caries (7.7%). Followed by the occlusal-central (4.21%), the occlusal-lingual zone (4.02%), occlusal mesial zone (3.06%) and the buccal zone (2.9%) (Figure 4).

Conclusions

Dental caries is still affecting a high percentage of 3-5 years old children. According to the results obtained, the occlusal surfaces of primary molars showed that the distal occlusal zone has the highest prevalence of dental caries when compared with other zones of the occlusal surface. Caries in enamel only showed the highest prevalence of caries. In general, this study gathered important information that should be further analyzed and taken in consideration when establishing preventive dental treatment in 3-5 years old children.

Acknowledgements

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References

