

Caries Risk Assessment of Children with Bronchial Asthma: A Retrospective Study

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Abstract

Purpose: It has been suggested that Asthma diagnosis may be associated with increased caries risk among the pediatric population. The present study aims to examine the correlation between caries occurrence for the pediatric population with or without clinical diagnosis of bronchial Asthma using dfs and dft scores as a caries risk assessment tool.

Methods: A retrospective study completed through a chart review process for patient population seen for initial comprehensive examination visit at SIUH dental clinic. The study population included 4 to 6 year old children diagnosed with Asthma disease prior to initial encounter. The control group consisted of healthy children of the same age group. dfs and dft scores are recorded as part of the standard comprehensive new patient examination and to be compared between the study and control groups.

Results: No statistically significant difference noted in in dfs and dft scores (p=0.641, p=0.926 respectively) between study and control groups. No association found between dental hygiene level and Asthma diagnosis (p=0.279) and in median dfs and dft scores between medication and non-medication users (p=0.247, p=0.093 respectively). A notable difference was noted in the dfs and dft scores among dental hygiene groups (p<0.001).

Conclusions: Current study showed no significant association between Asthma and dental caries experience in children 4-6 years of age. Asthma medication could not be linked as a causative agent to caries since dental caries experience was not affected by Asthma or asthmatic medication among asthmatic children. There was a notable difference in the dfs and dft scores among dental hygiene groups.

Materials and Methods

This study adopted a retrospective methodological design, which included a chart review process for 4 to 6 year old children seen for an initial comprehensive examination visit at SIUH Dental Department between January 1st, 2020 and March 31st, 2022. An institutional review board approval was obtained from Feinstein Institutes for Medical Research Northwell Health, Human Research Protection, Program Great Neck, NY, USA.

A total of 482 patients’ charts were obtained from the Staten Island University Hospital Dental Registry. Patients who did not meet the inclusion criteria were excluded from this review, such as the exclusion of patients with other diagnosed systemic diseases. Upon review, 58 patients met inclusion criteria for the study group. Control group comprised of 116 patients assigned to it by randomization process.

Children categorized under the asthmatic cohort were those whose parents reported physician diagnosis of Asthma and were assigned to the case group. Children whose clinical records revealed non-appearance of respiratory and other systemic diseases were categorized under the control group. This was followed by assessing oral hygiene, categorized into good, fair, and poor, presence of Asthma and Asthma medication, and dfs/dft scores. Obtained data was analyzed for any correlation between Asthma diagnosis and caries risk.

Results

This study reviewed the correlational likelihood between childhood Asthma and caries by reviewing Staten Island University Hospital Dental Registry charts. Asthma and control group children 4-6 years of age were shown to have no statistically significant difference in dfs and dft scores (p=0.641, p=0.926 respectively). The research revealed no significant association between dental hygiene level and Asthma diagnosis (p=0.279). In addition, there was no significant difference in median dfs and dft scores between medication and non-medication users (p=0.247, p=0.093 respectively). However, there was a notable difference in the dfs and dft scores among dental hygiene groups (p<0.001).

Discussion

With Asthma and dental caries being two of the most prevalent chronic disease conditions in the pediatric patients, it is of utmost importance to understand any potential associations between them. Proper understanding of correlation between these two entities will allow for the development of the most efficient and beneficial disease control and prevention programs. This question presents interest for both pediatric primary care providers and pediatric dentists in terms of clinical practice and public health awareness.^{1,2}

The relationship between Asthma and dental caries in pediatric population has long been studied. Conflicting data exists based on previous research for possible association of Asthma with increased caries risk. Findings differ significantly between different authors and evidence suggesting a possible association are inconclusive.

Multiple studies show no correlation between childhood Asthma with or without medication management and increased caries risk in primary dentition. Increased prevalence of dental caries between study groups and control groups was attributed to factors such as xerostomia due to persistent nebulizer use, frequent carbohydrate intake, compromised oral hygiene.³⁻⁶

Contrary to that, other authors showed significant correlation between these two diseases. Asthmatic children presented significantly higher dft scores mean values compared to the control group with severe asthmatics associated with the highest dft score results. Increased frequency of Asthma medication use was also shown to be correlated with increased likelihood of caries experience. The time-of-day Asthma medication used was also associated with increased caries risk in children in the primary dentition.⁷⁻¹¹

Conclusions

Current study demonstrated that there was no significant association found between Asthma and dental caries experience in children 4-6 years of age. However, other studies show contrasting results which can be attributed to a lack of standardization in research methods. One of the limitations of our study is the accuracy of diagnosis of asthmatic children in this age group, as well as the types and the effects of different medications prescribed. Another limitation was associated with inability to obtain detailed demographic data on the patients, which might contribute to the increased or decreased caries risk, as was shown by past research on the topic.

Future research is recommended to evaluate correlation between dental caries, childhood Asthma and other potential confounding factors such as patient’s socioeconomic status, parental level of education, ethnicity, diet, malocclusion, and possible obstructive sleep apnea. Different confounding factors can be attributed to possible dental caries progression in asthmatic children. However, additional research is needed to determine the intricacy of the associated diseases.

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