Chronic disease and Early Childhood Caries risk

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Abstract

- Dental caries also known as tooth decay is the most common non-communicable disease worldwide according to the World Health Organization. [1]
- Among children, dental caries is the most common chronic disease of childhood. Chronic diseases, such as diabetes, asthma, and obesity, are increasingly common in young children and may heighten the risk of early childhood caries.[2]
- These conditions can affect oral health through mechanisms such as altered saliva composition, dietary changes, and effects of medications.[2]
- **The primary objective of this study is to determine whether children with chronic conditions have an increased risk for early childhood caries.**

Materials and Methods

- A retrospective chart review was performed using records from Boston Medical Center's EPIC system, with data extracted from the Boston Medical Center Clinical Data Warehouse. The Pediatric Complex Chronic Conditions (PCCC) classification was utilized to categorize patients based on the number of chronic diseases they had: none, one or two or more.
- According to JAMA, the Pediatric Complex Chronic Condition (CCC) system is a tool for classifying chronically ill patients under the age of 18 in pediatric research. CCCs are expected to last at least 12 months and involve either several organ systems or 1 organ system requiring specialty pediatric care. This classification system aids in evaluating the severity of the condition, coordinating care, and ensuring the appropriate resources are available for effective treatment.[3]
- Demographic information and PCCC status were also collected through the Boston Medical Center Clinical Data Warehouse.
- Additionally, manual data entry was used to gather information from each subject's dental charting. The caries rates were then compared across the three PCCC categories.

Data analysis:
Chi square tests were used to assess the relationship between PCCC and dental caries.

Definitions and Abbreviations:
- **NDS**: Nutritional Drink Supplement such as Pediasure
- **PCCC:** Pediatric Complex Chronic Conditions classification
- **Early Childhood Caries (ECC)**: ≥1 decayed/missing or filled surfaces in primary teeth for children under age 6.[4]
- **Severe Early Childhood Caries (S-ECC):** any caries in a child younger than 3 years of age, ≥1 cavitated, missing or filled surfaces in primary max ant teeth in children ages 3-5 or a decayed, missing, or filled score of: ≥4 at age 3, ≥5 at age 4, ≥6 at age 5. [4]

Results

Table 1. Description of sample (n=694)

Gender	
Female	35.6% (n=247)
Male	64.4% (n=447)
Language spoken	
English	60.1% (n=417)
Haitian Creole	18.7% (n=130)
Spanish	7.6% (n=53)
Other	12.1% (n=84)
Pediasure status	
Cases (NDS)	36.7% (n=255)
Controls (non-NDS)	63.3% (n=439)
Caries Status	
% with ECC	41.9%(n=291)
% with S-ECC	26.2% (n=182)

Table 2. Bivariate Analysis

	% with ECC	P value*
PCCC=0	27.7%	***0.0204***
PCCC= 1 or 2**	21.4%	
P value considered to be statistically significant		

	% with S-ECC	P value*
PCCC=0	44.3%	***0.1140***
PCCC= 1 or 2**	34.0 %	
P value considered to be not statistically significant		

*Statistical significance based on chi-square test, with P≤0.05 in bold text.

**Note: values calculated with PCCC 1 and 2 combined

Conclusion

- Based on the bivariate analysis, healthy children or children with no complex chronic conditions (PCCC=0) were found to have a higher prevalence of both Early Childhood Caries (ECC) and Severe Early Childhood Caries(SECC) compared to children with at least one or more complex chronic conditions.
- The results of the study suggest that further investigation is needed to determine whether or not chronic conditions influence caries risk, given the limited sample size.
- PCCC is a useful tool for assessing medical complexity and may be beneficial in future dental research.

References

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