



# Early Antibiotic Exposure and Dental Caries in Children: Five-Year Retrospective Review

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## PURPOSE

To determine if early antibiotic usage for the treatment of tonsillitis, strep throat, and/or otitis media predisposes children to increased incidence of dental caries.

## INTRODUCTION

Antibiotics are used widespread for many bacterial infections. There is increasing evidence linking early and frequent antibiotic use in patients to an increased BMI. In 2018, the American Association of Pediatrics published an article examining the weight outcomes of young children as linked to early antibiotic exposure. The study examined over 700,000 patients and concluded that antibiotic use at <24 months of age was associated with slightly higher body weight at 5 years of age.<sup>1</sup>

In addition, research has correlated children that are overweight or have an increased BMI as having a higher caries risk than children with normal weight/normal BMI.<sup>2</sup>

The aim of this study was to evaluate patients who were prescribed antibiotics at less than 24 months of age for recurrent infections such as tonsillitis, strep throat, and otitis media and to evaluate their caries prevalence at age 5 to see if they have an increased incidence of caries.

## REFERENCES

- (1) Block JP, Bailey LC, Gillman MW, et al; PCORnet Antibiotics and Childhood Growth Study Group. Early Antibiotic Exposure and Weight Outcomes in Young Children. Pediatrics. 2018;142(6):e20180290
- (2) Angelopoulou, Matina V.1; Beinlich, Mitchell2; Crain, Alexander3"Early Childhood Caries and Weight Status: A Systematic Review and Meta-Analysis. Pediatric Dentistry, Volume 41, Number 4, July-August 2019, pp. 261-272(12).

## MATERIALS AND METHODS

IRB approval was obtained from UT Southwestern Medical Center and site approval from Children's Medical Center. This study was a retrospective chart review of patients followed at Children's Medical Center Otolaryngology Clinics and/or Pediatrics who have a history of early antibiotic use as prescribed for "tonsillitis", "strep throat" or "otitis media" and are seen by either CMC dental clinic or private practitioners for either restorative treatment under GA or in the dental clinic. Charts identified were from patients born 01/2014-09/2019 and included 8,760 charts. The patient population was ordered by DOB and sequentially allocated into groups of five. Two of the five groupings were analyzed in the investigation; amounting to a working group of 3,504 patients. Of the 3,504 patients, 202 patients met the inclusion criteria.

Data collection included:

1. Name of patient
2. Current Age
3. Age at Diagnosis (tonsillitis, strep throat and/or otitis media)
4. Type of antibiotics
5. Frequency of antibiotic prescription
6. Surgical procedures (FMDR, Tonsillectomy, Adenoidectomy)
7. Number of carious teeth
8. Payor source

Data was analyzed by descriptive statistics, Chi square and correlations.

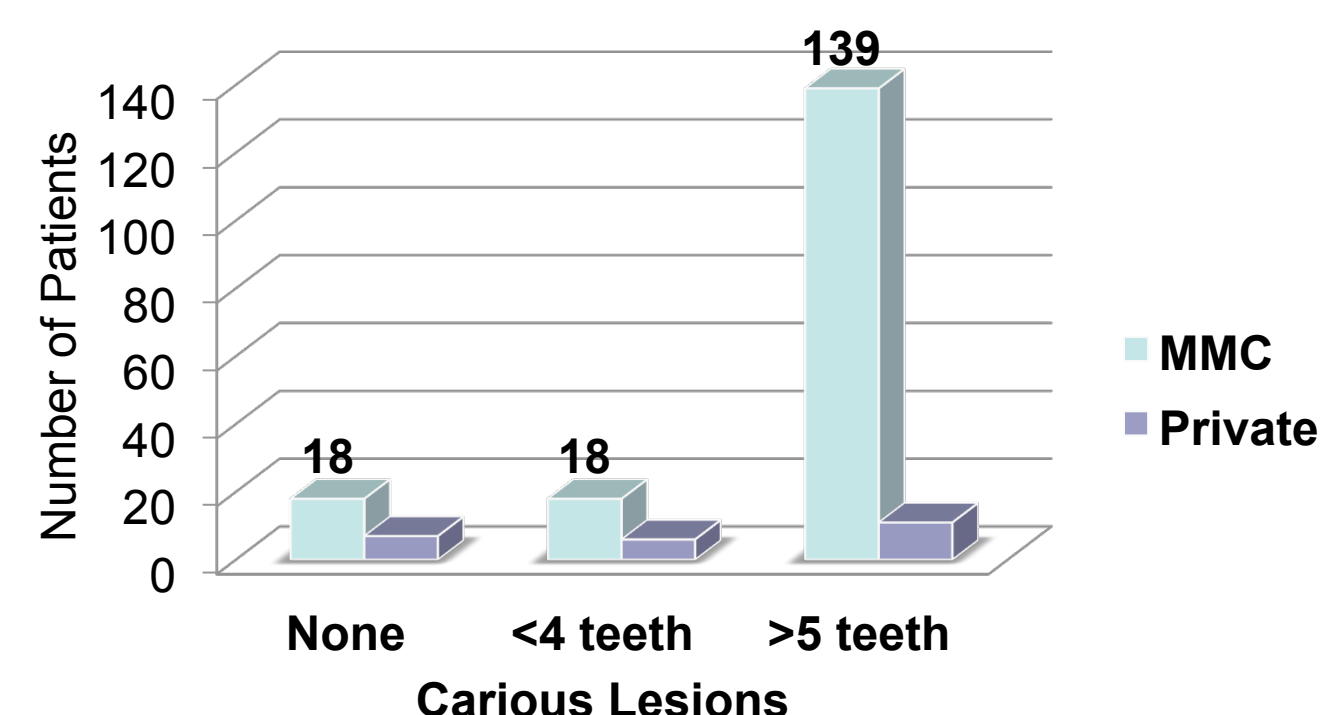
## RESULTS

- 202 patients met the inclusion criteria
- Mean age of diagnosis of otitis media, tonsillitis or strep throat was 0.88 years (~10.5 months)
- Average number of times antibiotics were prescribed: 3.15 (min=0; max=9)
- Average age at FMDR was 3.22 years (min=1; max=5 years)
- 17 patients had a tonsillectomy and 27 had adenoidectomy
- 157 MMC patients (89%) experienced caries compared to 17 private pay patients (71%)

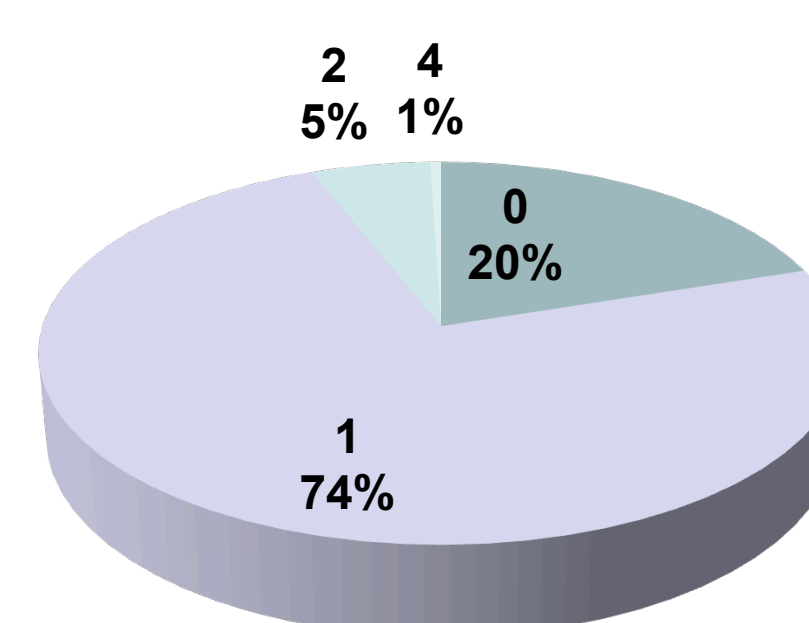
Frequency of Prescribed Antibiotics as Compared to Frequency of FMDR

Amount of times prescribed an antibiotic	FMDR: Yes	FMDR: No
0	1	0
1	50	10
2	27	10
3	17	5
4	19	6
5	21	3
6	12	2
7	6	0
8	3	1
9	2	3

Caries Experience by Payor Source



Amount of FMDR



## Results cont'd

Of the 202 patients that met the inclusion criteria, there was not a significant relationship between the age of medical diagnosis and the caries experience at age five.

There was no correlation found between the frequency of prescribed antibiotics as related to the patient's caries experience or their FMDR occurrences. Additionally, there was no correlation found between the frequency of prescribed antibiotics to the patient's payor source. This research could benefit from further analysis in two key areas: 1. Increase the study's power. 2. Investigate if the number of times a patient had antibiotics prescribed for a specific infection is related to their caries experience.

As previously proven in the literature, this study also found that there is a significant correlation between the incidence of caries and the payor source. MMC patients experienced a higher rate of caries than private pay patients.

There were three significant limitations in the patient dataset:

1. Patients seen by CMC Otolaryngology Clinic may see private dental practitioners; however, their dental record was not accessible for evaluation.
2. FMDR could have been performed outside of the CMC network and not captured within this dataset.
3. The majority of patients captured in this data had FMDR, thus skewing the results towards a higher caries experience.

Greater significance of the data may be found with a larger sample size, but there may not be any correlation between early antibiotic usage and a patient's caries experience.

## CONCLUSION

1. In this study, early antibiotic usage did not correlate with increased caries experience.
2. As noted in other studies, payor source and caries experience are significantly related.