



Introduction

Dental caries is the most prevalent and chronic disease in children and is a significant burden on the US's healthcare system every year. [1] For caries to develop, a susceptible host must be present, in addition to cariogenic bacteria and a substrate (sucrose) over a period of time. Saliva contributes significantly to preventing dental caries through its buffering capacity, flow rate, pH and ability to remineralize tooth structure. [4] In patients with dental caries, salivary pH decreases, further placing patients at risk. [5] A resting salivary pH of less than 6.0 contributes to an increase in the incidence of caries rate by approximately 60%. [2] Untreated dental caries may result in its rapid progression, development of pain or infection, which in more extreme cases may lead to hospitalization and death. Manifestations of systemic disease may affect the salivary pH and may increase a patient's risk of developing dental caries. [3]

Study Objectives

The objective of this research is to determine if there is a correlation between salivary pH and presence of carious lesions in pediatric patients who are seen on a regular basis during routine oral examination. Examination of saliva, especially the pH value, could serve as an indicator of caries risk and can help to provide a metric on which practitioners can counsel patients to help improve oral health. The ability to predict an individual's risk for developing dental caries could provide us with preventative measures that can be utilized to decrease caries risk. [4]

Methods

Subjects

The study was conducted over a period of 9 months at St. Barnabas Hospital and associated clinics in which 283 study participants were included. Study participants elected into the study after meeting the inclusion criteria below.

Inclusion Criteria	Exclusion Criteria
1. Patients between the ages of 3-14	1. Patients younger than 3 years old and older than 14 years old
2. Patients scheduled for routine periodic oral evaluation	2. Patients presenting for emergency treatment
3. Fasting time before appointment >30 minutes	3. Fasting time before appointment <30 minutes

Data Collection

Data was collected during clinical and radiographic examination during routine periodic oral evaluation. After clinical and radiographic examination, participants were be separated into two groups : Control Group : (no caries), Group 2 : (dental caries). A saliva sample was collected from study participants and determined with the Divolight digital pH meter.

Patients with previous dental caries were placed into either group depending on caries status. If a patient previously had dental caries that were treated between their last periodic examination, only new carious lesions were considered as positive for dental caries. Presence of plaque (+) or (-) was also documented throughout the study to see if oral hygiene improves during the duration of the study.

Results

The study compared salivary pH levels between a caries-free (control) group and caries group. The caries-free group (n=134) had a mean pH of 7.05 (SD = 0.28), whereas the caries group (n=149) has a mean pH of 6.88 (SD = 0.32). In addition, moderate plaque was seen in 102/149 (68.4%) and 80/134 (59.7%) participants in the caries and caries-free groups respectively. An independent samples t-test revealed a statistically significant difference between the groups (t(283) = 4.82, p < 0.001). The 95% confidence interval for the caries-free group-free group was 7.01-7.10 compared with 6.83-6.93 for the caries group, indicating non-overlapping intervals. The effect size was moderate (Cohen's d = 0.57) suggesting a meaningful difference in salivary pH. These findings indicate that higher salivary pH is a protective factor that contributes to the absence of dental caries in healthy pediatric patients.

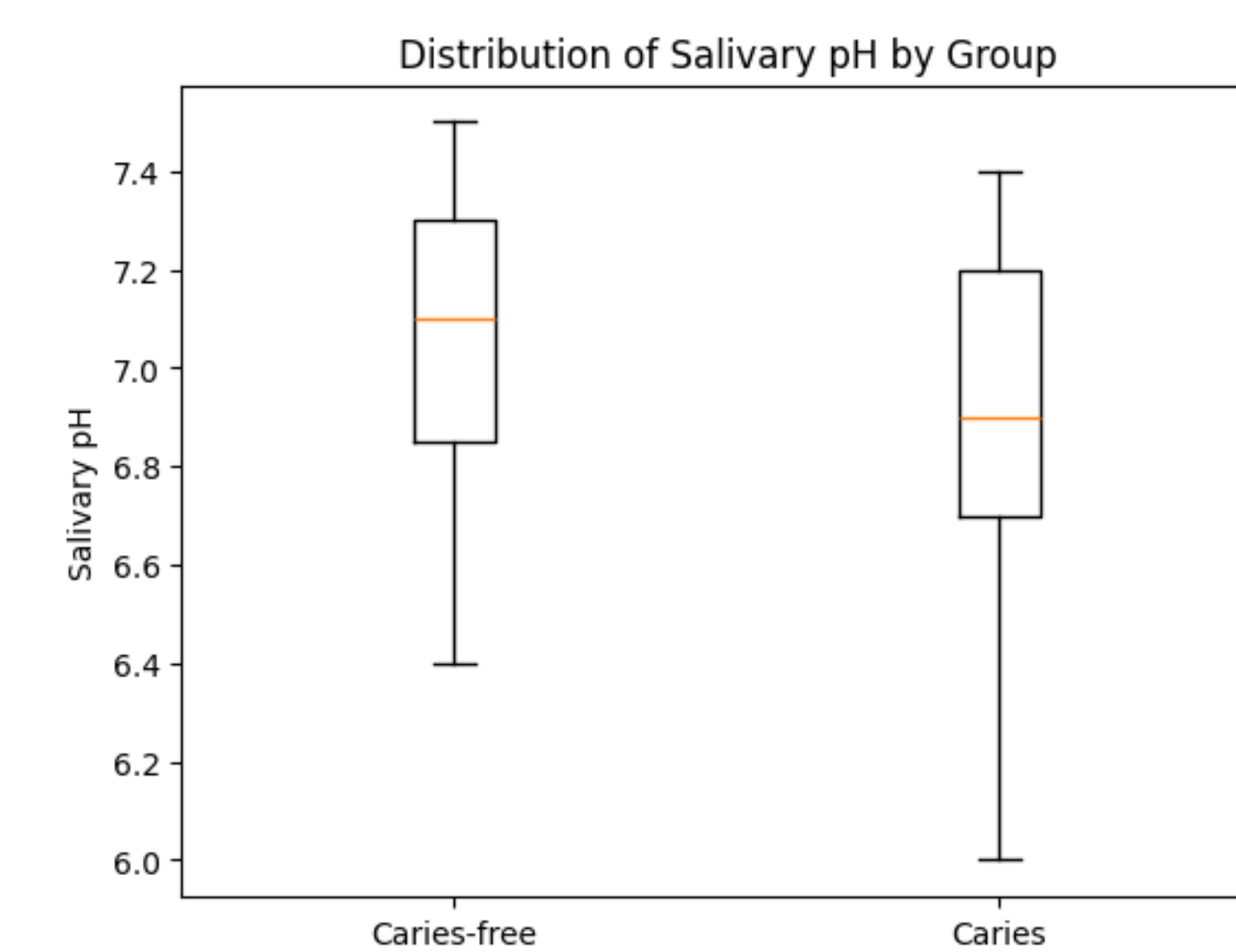


Figure 1.

Group	n	Mean	Median	SD	95% CI	t-value	p-value
Caries-free (control)	134	7.05	7.10	0.28	7.01-7.10	4.82	<0.001
Caries	149	6.88	6.90	0.32	6.83-6.93		

Table 1.

Discussion

Saliva is readily available and is the body's first defense against dental caries. As good oral health is essential to a patient's general health, we as practitioners must work to diagnose the disease correctly, treat it promptly and educate our patients on best practices for maintaining oral health. [4] In early diagnosis, we can prevent future wear to enamel and risk for complications due to carious lesion development by referral to the necessary practitioners. [6] This study hopefully will promote further research into salivary pH, its affects on the oral microbiome and how it pertains to pediatric dentists in clinical practice. Future research could address xerostomia, especially related to medications that increase its prevalence and how this affects caries risk in these patients.

Conclusion

Saliva serves as an important buffer to acidic challenges on a daily basis and higher pH may be associated as a protective factor against the development of carious lesions in healthy pediatric patients.

Study Limitations

The study is limited by number of study participants in each group and that several patients were lost to follow-up not returning after care was completed.

References

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