

Background

Children's

Hospital

Studies show younger age groups have a higher prevalence of carious lesions, especially on molar occlusal surfaces, due to factors like tooth morphology and enamel maturation. Dental sealants, introduced in the 1960s, effectively prevent caries but are underused, with fewer than half of children receiving them. Sealants penetrate pits and fissures to form a physical barrier on the tooth surface. Given the high caries risk of these areas, sealants are applied to occlusal surfaces and buccal grooves to prevent and arrest early enamel caries. At Nicklaus Children's Hospital, it is routine to seal all 1st permanent molars upon eruption at the 6-month recall, as long as behavior permits.

Objectives

This study aims to evaluate the effectiveness of dental sealants in preventing carious lesions at Nicklaus Children's Hospital (NCH) Dental Clinic, where patients have developed lesions despite sealant application. The objective is to assess whether this trend is statistically significant, comparing the observed protection rate to the CDC's established rates: 80% protection for 2 years and 50% for up to 4 years. The study also explores potential causes of this discrepancy, including factors like ASA classification, gender, Frankl score, and recall frequency, and examines the effectiveness of resin-based sealants. Properly placed sealants is a cost-effective caries control modality while also being a vital part in a comprehensive caries management approach.

Methods

This study utilized a retrospective chart review to analyze children aged 6-18 at the time of sealant placement, who received dental sealants on their permanent first molars between January 2016 and January 2023. Data was extracted from electronic dental records using Dentrix software, with chart reviews conducted at 6-month intervals to assess the development of carious lesions after sealant placement. This open cohort study also included patients who received sealants during the same time frame (January 2016 to January 2023), following the same review process. Data was analyzed in GraphPad Prism 10 using non-parametric tests due to the nature and distribution of the data. These analyses were conducted to determine whether factors such as sealant application location (operating room, sedation, or clinic), Frankl score, recall frequency, ASA classification, and gender influenced the occurrence of carious lesions after sealant placement.

EFFECTIVENESS OF RESIN SEALANTS IN A HIGH CARIES RISK POPULATION Ashley White, DDS | Jennifer Shamsian, DDS | Carolina Duarte Puerto, DDS, Ph.D | Gabriel Cardenas, MPH







Discussion

Data was collected from 600 patients, with 2,680 sealants placed. The sample was roughly equally divided between male (51%) and female patients, predominantly ASA I (66.9%), with a median age of 8.3 (1.8 SD) at sealant placement. Most sealant placements occurred in the outpatient dental clinic (94%). Of the sealed teeth, 19% developed carious lesions, with morbidity limited to 132 children (22%). You can compare the sealants applied during the baseline appointment with other additional graphs that outline the carious lesions on the first permanent molars. Nicklaus Children's Hospital primarily serves Medicaid patients, and in Florida, insurance covers sealants every 3 years, explaining the increase in sealants at 36 months. However, there was no significant increase at 72 months, which may be linked to the decline in follow-up attendance, showing a steady drop in evaluations after baseline sealant applications. Most of the population had no existing restorations (p<0.0001) at their first comprehensive exam, making them ideal candidates for sealants as a preventive measure against future carious lesions. Among existing restorations, tooth #14 had the fewest (p=0.0013), indicating it may have been less susceptible to caries or better maintained than other teeth. Among restored teeth, the occlusal surface was the most common, reflecting the tendency for decay to occur in molar pits and fissures where food and plaque accumulate.

Conc Usion

- 1. Regular 6-month follow-ups are essential for comprehensive care, sealant reapplication, and prevention, as they help avoid the need for restorations—which have a finite lifespan—by ensuring timely placement of preventive sealants.
- 2. A steady decline in patient follow-up attendance may impact the long-term effectiveness of sealants in preventing carious lesions.
- 3. Persistent carious lesions in high-risk populations highlight the need for improved family education, tailored preventive strategies, and more frequent preventive visits.

References

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