

Research Question

What differences exist between erythritol, glycine, and sodium bicarbonate powders in air polishing?

Abstract

The use of air polishers in the dental field is highly recommended; however, the ability to determine the correct powder and grit for each patient can be vital. The three types of powders have different pros and cons related to their function; though most studies show significant advantages of using air polishing in general. One study compared erythritol powder and the ultrasonic¹. In the results, pocket depths were decreased but there was no difference in effectiveness between the two; however, a decreased pain perception was observed in the air polisher. Another study compared the effects of erythritol, glycine (GPAP) and the ultrasonic, finding a significant difference between the air polishers and the ultrasonic in lowering bacteria count. Results of many of these studies favored erythritol and glycine powders over sodium bicarbonate (SBAP) due to the increased coarseness of sodium. The selectivity of these types of powders can increase individualized patient care. In conclusion, the usage of air polishing in dentistry, regardless of type of powder, shows remarkable improvements in oral health.

Introduction

Sodium Bicarbonate

- Large particle size and used for tenacious extrinsic stain removal
- Complications: Patients with sodium restricted diet and who are immunocompromised

Glycine

- Very fine, soft particles which makes it effective for subgingival biofilm removal
- Cemental defect volumes are decreased with using glycine
- 80% less abrasive than sodium bicarbonate
- Naturally occurring amino acid

Erythritol

- Used for subgingival plaque removal
- Natural sweetener derived from plants
- Some studies show it to suppress subgingival pathogens⁵

Review of Literature

Studies on the comparison between Erythritol, Sodium Bicarbonate, Glycine and control:

- A study compared erythritol and SBAP effectiveness on titanium disks for implants. Both powders were effective, however erythritol showed better post tx biofilm regrowth inhibition⁶
- Research compared GPAP, SBAP, and control (ultrasonic) and found that GPAP has significant improvement in plaque and gingival index scores and causes less erosion³
- In a study it discussed differences between GPAP and erythritol powders and found erythritol was less abrasive and had reductions in BOP sites²
- Research compared hand instruments and GPAP for subgingival plaque removal and found GPAP was superior to hand instruments in biofilm removal⁵
- Another study showed results of less gingival epithelial erosion by GPAP over any other technique⁴
- The usage of GPAP is useful on orthodontic patients because of the small particle size causing little to no damage for brackets⁸

Discussion

Limitations:

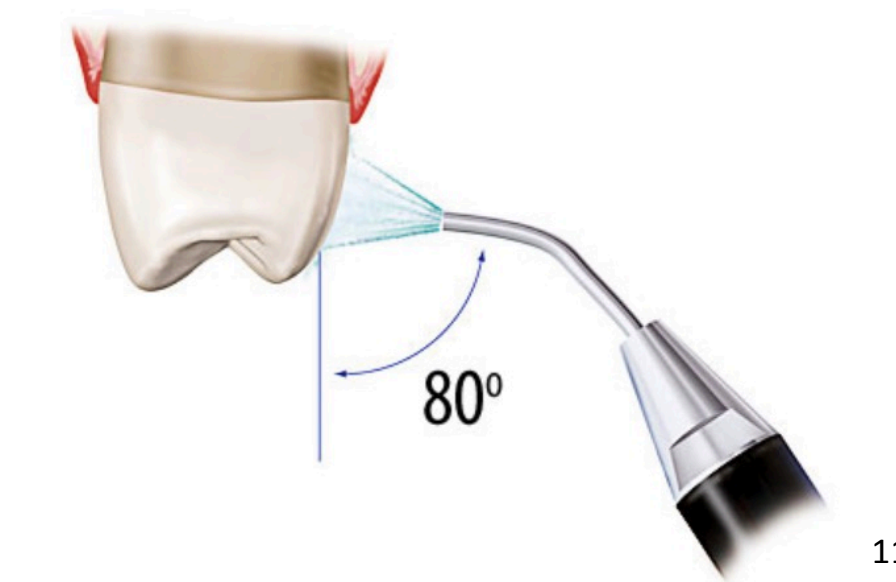
- A main limitation for these studies is that host responses of each patient are different, so the recovery of these treatments can differ depending on each patient
- Aerosol production from air polishers
- Contraindications for the powders

Recommendations:

- For dental professionals: try using air polishers rather than rubber cup polishing for increased proficiency and decreased damage

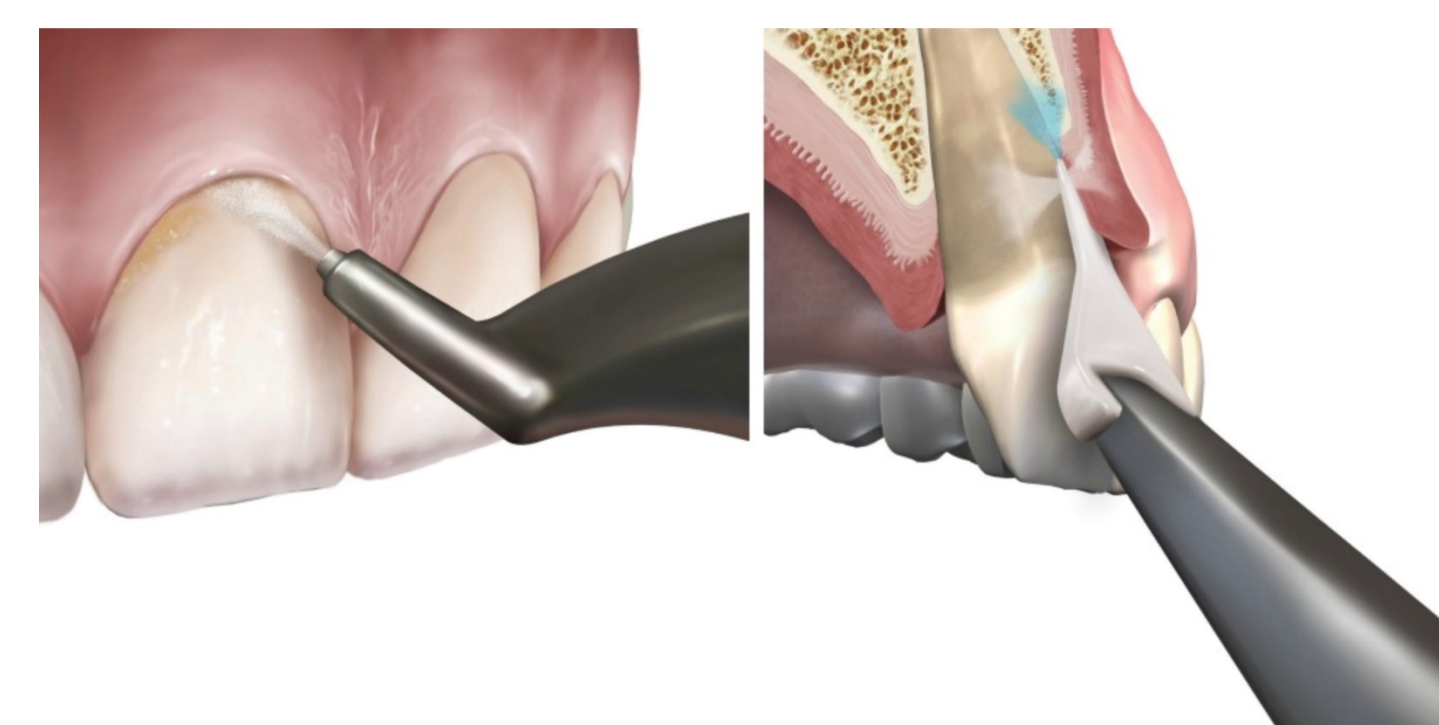
Future research:

- Should continue to explore the usage of these products in the dental field
- The increase usage of erythritol
- Compare traditional rubber cup polishing and air polishing effectiveness
- Possibly determine a safe product that is used for both sub and tenacious supra gingival plaque



Comparison of Sodium Bicarbonate, Glycine, and Erythritol Air Polishing Powders

Indications	Sodium Bicarbonate	Glycine	Erythritol
Removal of plaque biofilm	●	●	●
Removal of extrinsic stain	●	●	●
Use on enamel	●	●	●
Use on cementum	●	●	●
Use on dentin	●	●	●
Use within a sulcus on periodontal pockets	●	●	●
Use on restorative Materials	●	●	●
Cleaning of fissures prior to sealant placement	●	●	●
Cleaning of implant surfaces	●	●	●



Conclusion

The usage of air polishers in the dental field are not as abundant as they should be considering the vast amount of research supporting the advantages of them. If dental professionals use air polishers, there will be an increase in patient comfort and decrease in bacteria and biofilm residence. For subgingival biofilm removal, erythritol and glycine are the powders of choice, however, for supra gingival removal, sodium bicarbonate is a good choice. Research shows that glycine and erythritol are superior powders because of the decrease in abrasiveness, however, for tenacious staining, sodium bicarbonate is a superior choice. Overall, the usage of air polishers and their specific powders, are the quality choice of biofilm, stain and bacterial removal.

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