

Introduction:

Research Question: **How does the ketogenic diet affect the oral cavity?**

- Ketogenic **'keto' diet** emphasizes high fat, low carbohydrate consumption.¹
- Keto avoids simple carbohydrate and sugars.
 - Sugar substitutes are almost always utilized.⁸
- Fat heavy diets causes the body to go into **ketosis**: a process in which the body burns fat for energy because glucose isn't available.²
- The keto diet has many positive effects for the body, including several specific to the oral cavity:
 - Decreased caries risk, gingival inflammation, and bleeding.^{4,6,11}
 - Reduction of acidity and plaque mutans when paired with the keto approved sugar substitute: erythritol.⁹
- The keto diet also can cause 'keto breath' an overly sweet, fruit-scented breath.^{2,7}

Review of Literature:

Sugar Substitute Use on Keto Diet⁹

Keto Diet Sugar Substitutes Reducing Caries:

- 3 year comparative study of xylitol, erythritol, and sorbitol candy consumption
 - daily polyol consumption from the candies was approximately 7.5 g
- Initial plaque samples collected from all participants

Xylitol Group
No significant decrease in plaque growth or levels of acid

Erythritol Group

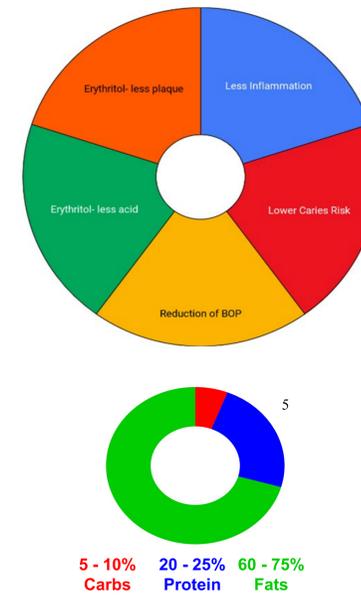
- Decrease in plaque levels
- Lower levels of acetic acid, lactic acid, and propionic acid than that of the other groups
- Lower counts of salivary and plaque mutans streptococci than the other groups

Sorbitol Group
No significant decrease in plaque growth or levels of acid

Erythritol is associated with reduce of acid levels within the oral cavity and reduction of salivary and plaque mutans.



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Low Carb, High Fat Diet and Gingival Inflammation¹¹

Randomized controlled pilot study

Recruitment phase: n=16

- Active gingivitis
- No change of oral hygiene throughout study
- Currently on high carb diet

Control group n=5

- No change in diet: high carbohydrate based diet

Experimental group n=11

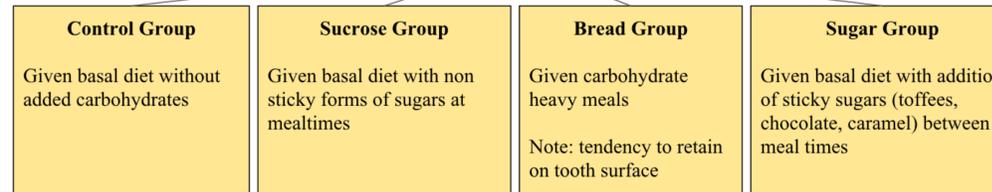
- Reduction of carbohydrates
- Low trans-fat intake
- High intake omega-3 fatty acids

Results

- Experiment group showed:
 - Reduction of gingival inflammation
 - Reduction of bleeding upon provocation
 - Reduction of periodontally inflamed surface areas

Low Carbohydrate Consumption and Caries Reduction⁴

Carbohydrate study:
Classic cohort study in 436 individuals over five years



Results

- Increased consumption of sugar can increase caries activity
- Risk is greater with stronger retentiveness of food consumed
- Risk is greatest with sticky forms of sugar eaten between meals
- When intake of sugar is reduced, the incidence of caries will fall

Recommendations:

- **Talk to patients about their diet!**
- Discuss the keto diet as an option with patients with high caries risk.
 - Reduction of carbs and sugars reduce incidence of caries.^{4,6,10}
- Keto diet can be recommended to patients with gingivitis to help reduce inflammation and bleeding of the gingiva.¹¹
- Erythritol should be recommended as a sugar substitute to patients on keto diet due to its ability to reduce acid and plaque levels in the oral cavity.⁹
- Keto breath can be masked by chewing gum to stimulate salivation.^{2,5,10}

Conclusion:

- Low carb, high protein and fat diets, such as the keto diet, have had a recent resurgence in popularity.^{2,3}
- Given the numerous beneficial effects on the oral cavity,^{3,4,9,11} it is important for dental hygienists know them and be able to educate patients using the keto diet.
 - Reduce caries risk by decreasing amount of sugary nutrients bacteria feed upon.⁴
 - Reduce gingival inflammation and bleeding without a change in oral hygiene performance.¹¹
 - Erythritol should be the sugar substitute of choice when on the Keto diet due to its association with reduction of acidity in the oral cavity and reduction of plaque.⁹

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