Policy on the Use of Xylitol

Review Council
Council on Clinical Affairs

Latest Revision
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Purpose

The American Academy of Pediatric Dentistry (**AAPD**) recognizes that there is considerable research on sugar substitutes, particularly xylitol, and their potential oral health for infants, children, adolescents, and persons with special health care needs. This policy is intended to assist oral health care professionals making informed decisions about the use of xylitol-based products with the aim of preventing caries in children.

Methods

This policy was originally developed by the Council on Clinical Affairs Committe and adopted in 2006. This document is an update of the previous version, revised in 2010. The update is based upon a review of current dental and medical literature related to the use of xylitol in caries prevention. A literature search was conducted using PubMed® with the terms: xylitol AND caries prevention; field: all fields; limits: within the last 20 years, humans, English, birth through 18. Two hundred eighty articles matched these criteria; 47 controlled clinical trial papers were reviewed for this revision. When data did not appear sufficient or were inconclusive, recommendations were based upon expert and/or consensus opinion by experienced researchers and clinicians.

Background

Xylitol is a five-carbon sugar alcohol derived primarily from forest and agricultural materials. It has been used since the early 1960s in infusion therapy for post-operative, burn, and shock patients, in the diet of diabetic patients, and as a sweetener in products aimed at improved oral health.[1] Dental benefits of xylitol first were suggested from Finnish studies using animal models in 1970.[2] The first xylitol studies in humans, known as the Turku Sugar Studies,[3,4] demonstrated the relationship between dental plaque and xylitol, as well as the safety of xylitol for human consumption. Xylitol as well as other sugar alcohols are not readily metabolized by oral bacteria, and thus are considered non-cariogenic sugar substitutes.[4]

Xylitol is available in many forms (e.g., gums, mints, chewable tablets, lozenges, toothpastes, mouthwashes, cough mixtures, oral wipes, nutraceutical products).[5-7] The chewing process enhances the caries inhibitory effect, which may be a significant confounding factor for the efficacy of xylitol gum.[8] Xylitol studies show varying results in the reduction of the incidence of caries,[9-18] transmission of mutans streptococci (**MS**) from mothers to children,[19-21] and MS levels in children.[7,12,22-36] Such studies have been performed with xylitol intake ranging from four to 15 grams per day divided into three to seven consumption periods.[5,6,16,18,23] Abdominal distress and osmotic diarrhea have been reported following the ingestion of xylitol.[5,6,23]

Overall results of these trials are inconclusive, and there appear to be study design issues and/or bias in many of the studies (e.g., insufficient sample size, control group issues, issues with randomization, blinding, and conflict of interest).[6-35] Data is inconclusive for caries reduction for short-term use.[9,12-14] Data also is inconclusive for long-term effectiveness for reduction of MS[12,35] and caries reduction.[11,15-18] Most studies used a very large dose and at high frequency (generally four to five times a day)[18,20,23,24,27,32,33,35] which may be unrealistic in clinical practice.

Policy statement

The AAPD:

- Supports the use of xylitol and other sugar alcohols as non-cariogenic sugar substitutes.
- Recognizes that presently there is a lack of consistent evidence showing significant reductions in MS and dental caries in children.
- Recognizes that the large dose and at high frequency of xylitol used in clinical trials may be unrealistic in clinical practice.
- Supports further research to clarify the impact of xylitol delivery vehicles, the frequency of exposure, and the optimal dosage to reduce caries and improve the oral health of children.

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