

Theobromine: Safe alternative for fluoride in dentifrice. How theobromine was discovered?

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Abstract

Statement of the Problem: Caffeine (1,3,7-trimethylxanthine) and theobromine (3,7-dimethylxanthine) both are members of the xanthine family. Coffee and many soft drinks contain caffeine. Theobromine is the main ingredient in cacao and chocolate is made from. Over 35 years ago, simple experiment in which the diet fed to lactating dams had caffeine added. The mineral contents of the tooth from the pups which sucked the caffeine-containing dam's milk were decreased. The experiments were started to determine if caffeine would affect either enamel or dentin or both.

Methodology & Theoretical Orientation: Dams were fed with caffeine diet and their pups were sacrificed at postnatal day 22 and 1st molars were extracted and enamel surface were exposed to weak acid solution. Ca, P, and Mg of the dissolve solution from the caffeine group were more than the control. Enamel and dentin were separated. The crystallite size of the enamel of the pup's tooth from caffeine group was smaller. By feeding a cariogenic diet, caffeine group showed the higher incidence of caries score in the separate study. We conducted an experiment to grow apatite crystals in vitro by adding various member of the xanthine group. Theobromine produced larger crystal sizes compared to caffeine. We conducted the exactly the same procedure as caffeine, but adding theobromine in the maternal diet. The dissolved minerals on this group were far less compared to control. Because the chemical which affects the enamel structure is only fluoride, theobromine might play a similar role like fluoride, but much safer because chocolate has been eaten over centuries without any adverse effects in the human health. The comparative studies of the various parameters between theobromine and fluoride were done. Recently fluoride was designated as one of the developmental neurotoxicants as more adverse effects of fluoride are revealed.

Findings: The comparative studies have shown theobromine based dentifrice are superior each parameter studied.

Conclusion & Significance: In the first time, non fluoride dentifrice based upon theobromine was developed and

this is safe and effective compared to that of the fluoride based dentifrice.



Biography

Tetsuo Nakamoto: Education, Nihon University, School of Dentistry, Tokyo, Japan, DDS, 1964, Dentistry. University of Michigan, Ann Ar-bor, Michigan, Graduate Dentistry, MS, 1966, Prosthodontics. University of North Dakota, Dept. of Physiology and Pharmacology, School of Medicine, Grand Forks, North Dakota, MS, 1969, Physiology. University of Michigan, Dept. of Physiology, Medical School, Ann Arbor, Michigan, MS, 1971, Physiology. Massachusetts Institute of Technology (MIT), Dept. of Nutrition and Food Science, Cambridge, Ma., PhD, 1978, Nutritional Biochemistry and Metabolism. The founding members of Theodent (New Orleans) and Chief Scientific Officer (CSO) and Chairman of the board, 2007-Present. The BioInnovation Center, New Orleans. La. The founding members of Theocorp Holding Company (New Orleans) and CSO and Chairman of the board, 2007-Present. The BioInnovation Center, New Orleans, La. Professor of Emeritus, LSU Health Sciences Center, New Orleans, La., 2006- Present. Professor of Pediatrics, Dept. of Pediatrics, School of Medicine, LSU Health Sci-ences Center, New Orleans, La, 2000 – 2006. Professor of Physiology, School of Medicine, School of Dentistry, and Graduate School, LSU Health Sciences Center, New Orleans, La, 1991 – 2006, he was an assistant and associate professor before the promotion to a professor.

Publications

1. Fluoride Exposure in Early Life as the Possible Root Cause of Disease In Later Life.
2. Theobromine Upregulates Osteogenesis by Human Mesenchymal Stem Cells In Vitro and Accelerates Bone Development in Rats.

3. Combined effects of caffeine and malnutrition on the newborn rat's myocardium.

4. Evaluation of human enamel surfaces treated with theobromine: a pilot study.

5. Caffeine suppresses the expression of the Bcl-2 mRNA in BeWo cell culture and rat placenta.

6. Effects of caffeine on the saturated and monounsaturated Fatty acids of the newborn rat cerebellum.

Association of different zinc concentrations combined with a fixed caffeine dose on plasma and tissue caffeine and zinc levels in the rat