

Dental Research

More than 370 papers on original dental research were presented at the 40th annual meeting of the International Association for Dental Research, held March 15-18, 1962, in St. Louis, Mo. The papers were on a wide range of subjects, including basic aspects of oral biology, dental health education, disease prevention, clinical methods, and evaluation of materials used in dentures and fillings.

Radionuclides in Teeth

Research on the accumulation of strontium-90 in teeth was reported by Dr. Harold L. Rosenthal, Dr. John E. Gilster, and Dr. John T. Bird of the Washington University School of Dentistry. They said that preliminary results of a study of baby teeth from St. Louis children showed that teeth of bottle-fed children born in 1956 have accumulated 16 times as much strontium-90 as teeth of bottle-fed children born in 1947. The amount is still far below a level that warrants controls, the scientists stated.

The 5-year study has 3 more years to run, but data already collected indicate that the study will produce the information needed about whether teeth can be used to measure the body's burden of radionuclides, the scientists said.

Their tests showed that strontium-90 increased from 0.15 micromicrocurie per gram of tooth calcium in children born in 1947 to 2.50 micromicrocuries in teeth of children born in 1956. According to the research group, their data indicate that the accumulation of strontium-90 in teeth of children born as late as 1956 may not have as yet reached peak values.

Further studies by the group will compare the strontium-90 content of decayed and non-decayed teeth, of teeth from breast-fed and bottle-fed babies, of the dentin and enamel parts of teeth, and of teeth and bone.

Discovery of a masking effect that conceals radioactivity in developing teeth was reported by Dr. John F. Cleall, Dr. Michael G. Buonocore, and Dr. Alfredo Fonts from the Eastman Dental Dispensary, Rochester, N.Y. In previous research on radioactive isotopes deposited in newly formed dentin, apparent reduction of radioactivity with time has been observed. However, the Eastman group, through experimentation with rat teeth, found that the apparent decrease in radioactivity is caused by an influx of inorganic materials into the dentin during development, which increases the "self-absorption" of the radioactive isotopes present, thus masking the actual amount. The group found no apparent decrease in radioactivity in tooth enamel with time.

Fluoridation

Fifty percent fewer decayed, missing, or filled teeth were found among 18- and 19-year-old natives of Aurora, Ill., where the drinking water contains about 1.2 parts per million of naturally occurring fluoride, than among a similar group of lifetime residents of Rockford, Ill., where the water contains only about 0.1 part per million, reported Dr. H. R. Englander, Dr. R. De Palma, and Dr. R. G. Kesel of the University of Illinois College of Dentistry.

The authors of the report said that the study is the first published report of attempts to measure and compare aspects of periodontal disease, extent of oral debris and calculus, and dental caries in young white adults native to communities with optimum and deficient amounts of fluoride in the drinking water. The study groups were similar in socioeconomic conditions, level of dental care, ancestry, and diet.

Almost five times as much tooth loss occurred

in Rockford, the fluoride-deficient community, as in Aurora despite the almost equal level of dental care in the communities. Loss of one or more first permanent molars was more than five times as frequent in Rockford.

No one in the Rockford group was free from caries, while 12.5 percent—one in eight—of the Aurora group were caries free. There were more than three times as many teeth with open carious lesions in the Rockford group.

The low caries incidence previously reported for children in Aurora apparently did not have a tendency to "catch up" in 18- and 19-year-olds, the researchers said.

No important difference in calculus deposition was found between the two groups, the scientists reported. No one in Aurora had objectionably mottled teeth because of exposure to water containing fluoride. An occasional case of "the very mildest form of mottled enamel" was detected.

In another study reported at the conference, children living in an area with fluoridated water also received topical preventive treatments using stannous fluoride, and the effect of these additional exposures to fluoride were examined. The study was conducted by Dr. J. C. Muhler of Indiana University and Dr. C. W. Gish of the Indiana State Board of Health.

The study population of 1,100 children was divided into four groups. The first received no additional treatment; the second had their teeth cleaned with a prophylaxis paste containing stannous fluoride; the third had such cleaning plus topical application of an 8 percent stannous fluoride solution; and the fourth group had both the treatments given the third group and in addition were asked to brush their teeth at home with a dentifrice containing stannous fluoride and calcium pyrophosphate.

When the children were examined 6 months later, all those given topical treatment had significantly less decay than group 1, who had no topical treatment, Dr. Muhler said. Furthermore, each additional topical preventive measure added protection against decay.

A study of dental health of the children of a community in relation to the community's voting pattern in three successive plebiscites on fluoridation was reported by Dr. C. R. Castaldi,

Dr. W. A. Quigley, and Dr. W. Zacherl of the University of Alberta. Voters from high socioeconomic areas had consistently voted heavily in favor of fluoridation, while those from low socioeconomic areas consistently voted against it. Yet, according to examinations of 801 children from the high, medium, and low socioeconomic areas voting in the plebiscite, those in the lower socioeconomic levels had a significantly higher rate of tooth decay in permanent teeth and less evidence of good dental care than those in higher socioeconomic levels. No significant differences in tooth decay were found in baby teeth of the children in the three groups.

Genetics

The role of heredity in development of dental caries has been studied in a series of experiments on rats by a Michigan State University team headed by Dr. Sam Rosen. Two strains of rats, one inbred to be susceptible to caries and one resistant to development of caries, were crossbred and their offspring were studied. The scientists stated that the offspring were usually slightly more caries resistant than caries susceptible, indicating a tendency for the genes controlling resistance to be dominant.

Iceland Survey

Dr. Palmi Moller of the University of Alabama School of Dentistry reported an extremely high prevalence of dental decay among the 609 Icelandic children, 2 to 7 years old, whom he surveyed in 1961. Moller said dental caries was negligible in Iceland a century ago. He attributed the increase in dental decay to higher consumption of foods containing refined carbohydrates and to the habit of midmorning and midafternoon sweet snacks.

Findings of the Icelandic survey indicated considerably higher DMF and DF counts for children at all age levels than for children in comparable studies in North America and Europe. The average DMF count for primary teeth of the 6-year-old children in the survey was 7.75 compared with 5.13, 4.85, and 6.41 for 6-year-old children in Oregon, Hungary, and England respectively.