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Virulence and transmission of bacteria inducing tooth decay

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Dental caries (tooth decay) is the most prevalent chronic disease in children in the United States, affecting 28% of 2-5 year-old and 49% of 5-8 year-old children. *Mutans streptococci* (MS) are one group of the major caries-causing bacteria. Children with early colonization of MS had significant higher dental caries later in their life. Although MS transmission from mother to child is widely accepted as a main source of early acquisition of MS in children, studies have shown the importance of other transmission routes to children, including other caregivers and playmates. Further, a wide diversity of MS genotypes is present in the mother but only some maternal MS genotypes are transmitted. Therefore, specific virulence factors may be related to transmission of MS to children. This presentation summarizes several studies that we have conducted to investigate the transmission routes of MS in children including maternal, intergenerational and horizontal transmission. We also investigated possible virulence factors that may relate to transmission of MS including biofilm and mutancin formation. Our results confirmed that non-maternal transmission routes play an important role in MS colonization in children and mutacin activity of MS is also related to transmission. Identification of virulence factors associated with MS transmission is important in developing strategies for caries prevention. It is also important to include nonmaternal transmission routes as a part of caries prevention protocols for children.

Biography

Ling Zhan, DDS, PhD, is currently an Assistant Professor in the Division of Pediatric Dentistry, Department of Orofacial Sciences at the University of California, San Francisco. As a researcher and pediatric dentist, her research focuses on translational research on microbiological aspect of dental caries to improve oral health in children. Her current research project uses high-through-put genomic and metagenomic assays to identify virulence genes in mutans streptococci and study their function.

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