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Updated caries risk assessments model incorporating *Scardovia wiggsiae*

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Abstract

Early Childhood Caries (ECC) is the most prevalent chronic infectious disease in children and adolescents. This multifactorial disease affects 25% of children in the US and can have significant impact on the child's quality of life. Microbiological, particularly *Streptococcus mutans,* and dietary factors are primary contributors in the development of ECC and its most aggressive form Severe ECC (SECC). Recent re-assessment of SECC found a new caries-associated species *Scardovia wiggsiae,* and grouped foods by suspected cariogenic potential. We aimed to test these factors to improve discrimination between caries and caries-free children over that of *S. mutans* alone.

Data used was the microbiota from anaerobic culture (Tanner et al. 2011) and diet survey (Palmer et al. 2010). We evaluated two discriminating models: the microbiota alone and the microbiota with liquid cariogenic foods (juice, ice cream, jello, soda). In the microbial model, the ROC for *S. mutans* alone was 62.61%; adding *Streptococcus sobrinus* ROC 63.29%; adding *Scardovia wiggsiae* ROC 69.73%; adding *Veillonella parvula* ROC 75.26%; adding *Actinomyces gerensceriae* ROC 78.00%, and adding *Streptococcus cristatus* ROC 81.46%. In the microbiota/diet model the values for adding bacteria after diet were for *S. mutans* ROC 74.60%; adding *S. sobrinus* ROC 74.98%; adding *Scardovia wiggsiae* ROC 78.54%; and adding *Veillonella parvula* 80.62%.

We conclude that caries risk assessment has the potential for improvement using updated features including *S. wiggsiae* and grouped dietary components. Effective treatment and prevention strategies based on optimal risk models will allow care to be directed to children most at need.

Biography

Dr. Natalia Chalmers received a D.D.S. from the Medical University of Sofia (1999), and a Ph.D. (2008) and a certificate in Pediatric Dentistry from the University of Maryland (2012). She is board eligible for the American Board of Pediatric Dentistry and was the recipient of an NIDCR T32 Post-Doctoral Fellowship from the Forsyth Institute, Boston, MA. Her current research interests are Evidence-Based Pediatric Dentistry, the oral microbiome of severe early childhood caries and oral Graft-Vs.-Host Disease. In her leadership positions Dr. Chalmers is an officer of the IADR Women in Science group and a Fellow of the American Academy of Pediatric Dentistry Pediatric Oral Health Research and Policy Center. Dr. Chalmers has co-authored publications in highly regarded journals including the Journal of Dental Research, Journal of Bacteriology and the Journal of Clinical Microbiology.