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Streptococcus mutans and systemic diseases: Current knowledge and future perspective

Streptococcus mutans, a major pathogen of dental caries, is occasionally isolated from blood of patients with bacteremia and infective endocarditis (IE). It has been demonstrated that an approximately 120 kDa collagen-binding protein (Cnm protein) located on the bacterial cell surface is an important factor for onset of IE, as animal experiments using genetically engineered *S. mutans* strains have clearly demonstrated that Cnm is a major factor for its development. In addition, Cnm-positive *S. mutans* strains have been more frequently identified in saliva obtained from patients with cerebral hemorrhage, a major complication of IE, as compared to that from healthy subjects. An animal model of cerebral hemorrhage revealed aggravation of cerebral hemorrhage following infection with Cnm-positive *S. mutans* via the jugular vein. Interestingly, Cnm-positive *S. mutans* strains have also been more frequently identified in patients with cerebral micro-bleeding. Analyses of various *in vitro* experiments showed that Cnm of *S. mutans* possibly inhibits hemostasis of impaired blood vessel endothelium. Furthermore, Cnm-positive *S. mutans* strains have been shown to aggravate inflammatory bowel diseases and non-alcoholic steatohepatitis by elevating the level of disease-related cytokines secreted in liver tissue. Although large-scale human studies are needed to conclude the relationship of Cnm-positive *S. mutans* with systemic diseases, it is possible to speculate that oral health approaches to control this specific type of *S. mutans* may lead to improve a systemically healthy condition.

Biography

Kazuhiko Nakano completed his DDS degree at Osaka University and received a PhD from Osaka University. Later, he was appointed as Chief of the Outpatient Clinic of the Pediatric Dentistry Clinic, Osaka University Dental Hospital. More recently, he became Professor of the Department of Pediatric Dentistry, Osaka University Graduate School of Dentistry as well as Head of the Pediatric Dentistry Clinic of Osaka University Dental Hospital. He is a trustee of the Japanese Society of Pediatric Dentistry, and a member of the International Association of Dental Research. He has authored and co-authored many original research articles and clinical reports, as well as several book chapters in the field of pediatric dentistry and clinical oral microbiology.

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