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Ecologic effect of casein phosphopeptide amorphous calcium phosphate in dental caries**Betül Kargul, Basak Durmus and Durhan A**
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Aim: Casein phosphopeptides (CPP) stabilize calcium phosphate through the formation of casein phosphopeptide amorphous calcium-phosphate complexes (CPP-CP). Contemporary caries prevention protocols recommend not only effective remineralizing of CPP-ACP but also to reverse the dental plaque dysbiosis responsible for caries. This brief overview aims to propose the mechanisms and the evidence for CPP-ACP effects on the ecology of oral microbiome.

Background: Ideally, casein phosphopeptide amorphous calcium phosphate (CPP-ACP) should be able to influence the cariogenic bacteria responsible for the microbial dental plaque dysbiosis. Some studies showed that fluoride ions can inhibit the acidogenicity, aciduricity and glucan synthesis of cariogenic bacteria. However, it is still unclear the antimicrobial effect of fluoride for caries prevention. The study demonstrated that fluoride containing toothpastes could not sustain anti-acid activity over time. In this regard, new remineralizing technologies promise a beneficial shift in the dental plaque microbiology.

Review Results: CPP-ACP is probably the most studied non-fluoride remineralizing technology. CPP-ACP maintenance the high calcium concentrations in dental plaque may have antibacterial effect. Calcium induces streptococcal membrane permeability and partial lysis. CPP-ACP may possibly have cariostatic action as inhibition of demineralization, enhanced remineralization, reduced bacterial adhesion, buffering action, biofilm disruption and bacteriostatic/bactericidal effects.

Conclusion: The role of CPP-ACP for reducing bacterial counts in dental plaque and saliva needs further elucidation.

Clinical Significance: The current evidence for CPP-ACP effects on the oral microbiome ecology. The use of CPP-ACP offers the control of dental caries process.

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Recent Publications

1. Rose R K (2000) Binding characteristics of Streptococcus mutans for calcium and casein phosphopeptide. Caries Research 34(5):427-31.
2. N Philip and L Walsh (2018) The potential ecological effects of casein phosphopeptideamorphous calcium phosphate in dental caries prevention. Aust Dent J.
3. Marie-Claudtre Ombe, C Orinnec Lavkt and Jean-Michemla Nias (1991) Calcium regulation of growth and differentiation in Streptococcus pneumoniae. Journal of General Microbiology 138:77-84.

Biography

Betul Kargul has completed her Graduation at Marmara University, Faculty of Dentistry in 1986 and started to study as a PhD student in 1987. She has been lecturing and directing undergraduate and postgraduate programmes. Her research expertise is epidemiology, caries research in children, preventive dentistry and dental materials. She has published more than 90 referred papers and has more than 120 presentations in the international congresses. She was a Councilor in European Academy of Pediatric Dentistry from 2002-2012. Currently, she is working as a Full Professor in the Department of Pediatric Dentistry, Dental School at Marmara University, Istanbul, Turkey.

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