Introduction

Caries formation and remineralization: Caries formation is an active process of sequential stages of demineralization/remineralization. In dentistry, a white spot lesion can be described as a localized area of enamel porosity that is caused by tooth minerals loss from the deep layers of enamel while he surface is somehow sound. The clinical appearance of white spot lesions can be noted as 2 weeks from the formation of the initial biofilm.

Caries diagnosis and management have been recently improved due to advanced knowledge of caries formation. A carious lesion may progress, revert or stay unchanged. The clinical appearance of white spot lesions can be noted as 2 weeks from the formation of the initial biofilm. Researchers develop the management of caries, moving it in the direction of minimal intervention dentistry (MID), which depend on biologic therapeutic approach rather than surgical approach.

MID is the modern medical approach to the management of caries, utilizing caries risk assessment, and focusing on the early prevention and interception of disease. Moving the focus away from the restoration of teeth allows the dentist to achieve maximum intervention, with minimal invasive treatments. The four core principles of MID can be considered to be: (1). Recognition: Early identification and assessment of potential caries risk factors. (2). Reduction: To eliminate or minimize caries risk factors by altering diet and lifestyle habits and increasing the pH of the oral environment. (3). Regeneration: To arrest and reverse incipient lesions, using appropriate topical agents including fluorides and casein phosphopeptide-amorphous calcium phosphates (CPPACP). (4). Repair: When cavitation is present and surgical intervention is required, conservative caries removal is carried out to maximize the repair potential of the tooth and retain tooth structure.

Considering the clinical significance of remineralization, a range of remineralizing agents including non-fluoridated products has been developed to enhance enamel remineralization. Recently, some products such as casein phosphopeptide amorphous calcium phosphate (CPP-ACP), tricalcium phosphate and resin infiltrant are widely used.
Casein phospho-peptide amorphous calcium phosphate (CPP-ACP) is used in some remineralizing agents and its application significantly results in limiting the progression of early carious lesions. However, the application of CPP-ACP in a paste form, have shown controversial outcomes. Although, patients with milk protein allergies should not consume products containing CPP-ACP. 

Tricalcium silicate materials as mineral trioxide aggregate promote bio-mineralization. This material has biocompatible properties showing antimicrobial activity. Some studies reported that calcium silicate-based materials play an important role in hard tissue reparative regeneration because of its bioactivity and biocompatibility, also they are capable of inducing in vivo osseointegration.

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References


