Clinical Studies of Dental Erosion and Erosive Wear

M.C.D.N.J.M. Huysmans\textsuperscript{a} H.P. Chew\textsuperscript{b} R.P. Ellwood\textsuperscript{b}

\textsuperscript{a}College of Dental Science, Radboud University Nijmegen Medical Centre, Nijmegen, The Netherlands;
\textsuperscript{b}Dental Health Unit, University of Manchester, Manchester, UK

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Abstract
We define erosion as a partial demineralisation of enamel or dentine by intrinsic or extrinsic acids and erosive tooth wear as the accelerated loss of dental hard tissue through the combined effect of erosion and mechanical wear (abrasion and attrition) on the tooth surface. Most experts believe that during the last decade there has been a significant increase in the prevalence and severity of erosive tooth wear, particularly in adolescents. Even when erosive wear occurs in its milder forms, this is a matter of concern, as it may compromise the integrity of an otherwise healthy dentition in later life. The erosive wear process is complicated and modified by many chemical, behavioural and associated processes in the mouth. If interventions are to be developed it is therefore important that in vivo methods are developed to assess the outcomes of the erosion and erosive wear processes and the effects of interventions upon them. This paper discusses potential methods of investigating erosion and erosive wear in vivo and the difficulties associated with clinical studies.

Tooth wear has been described as presenting itself in different types: abrasion, attrition and erosion being the most common. Dental erosion has been defined as a chemical process that involves the dissolution of enamel and dentine by acids not derived from bacteria when the surrounding aqueous phase is undersaturated with respect to tooth mineral [Larsen, 1991]. Erosion results in the softening of enamel and dentine, which, in combination with mechanical factors such as abrasion and attrition, results in accelerated, pathological wear of the teeth. Although the terms dental erosion and dental erosive wear are often considered synonymous, we will refer to this erosion-facilitated wear as ‘erosive wear’, reserving the term erosion only for the chemical process as defined above. The clinical condition of erosive tooth wear is recognised to have a multifactorial etiology [Young et al., 2008]. Together with the limitations in our clinical detection of signs of ‘pure’ erosive wear, this suggests that wear types are not mutually exclusive, but rather reflect overlapping zones in an etiological spectrum.

The histopathological aspects of both enamel and dentine erosion are described by Lussi et al. [2011]. The generalised pathological wear resulting from erosion may compromise the health of individual teeth and of the entire dentition.

The rate and severity of erosive wear result from the interplay between several chemical, biological and be-