Approaches for Prevention & Control of Dental Erosion

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In light of increasing reports of the incidence and prevalence of dental erosion, it is now necessary that dental practitioners are familiar with the etiological and predisposing factors of dental erosion as well as the possible ways of its prevention and control. It may be easier to gain patients' compliance with the advice of administering a remineralizing agent immediately following an acidic challenge to enhance rapid remineralization of the softened tooth surface as well as serve as a mouth refresher, or alternatively, a neutralizing solution to buffer the acidic oral environment. Effective counseling on erosion prevention regimens should involve all healthcare personnel, doctors, pharmacists, nurses/hygienists and clinical psychologists.

Dental erosion, otherwise known as erosive tooth wear, is the loss of dental hard tissue either through dissolution of a tooth surface solution by acids of non-bacterial origin or by chelation. The incidence and prevalence of dental erosion is increasingly being reported. This is evident from prevalence studies conducted in different parts of the world, which showed the percentage of individuals affected by erosion (Table 1) among various age groups. This has prompted a series of research on the possible approach for prevention and control of dental erosion, while its management is now an area of clinical practice that is undoubtedly expanding.

This article describes an overview of the up-to-date information on the factors that predispose individuals to the risk of dental erosion, and the possible strategies to prevent and control the development of this disorder.

Predisposing Conditions

An important step towards prevention of dental erosion should be the identification of those individuals who are at risk of dental erosion. Evidence based on case reports, clinical trials, epidemiological, cohort, animal, in vitro and in vivo studies have described specific acids that could cause dental erosion as originating from gastric, dietary or environmental sources. Based on this fact, certain factors, classified as either intrinsic or extrinsic, have been identified as predictors of susceptibility to dental erosion.

Dental erosion due to intrinsic factors is caused by gastric acid reaching the oral cavity and the teeth, and acting regularly on the dentine, causes a disease process of several years. This may be the result of chronic vomiting, persistent regurgitation or rumination. The acidity of the gastric juice ranges from pH 1 to 3, so it is conceivable that regurgitation or vomiting into the mouth might result in marked tooth destruction in the form of erosion.

Conditions that are associated with chronic vomiting or regurgitation and therefore can predispose an individual to the risk of erosion are: 1) certain medical conditions such as bulimia nervosa, gastro-esophageal reflex disease (GERD), cyclic vomiting syndrome (CVS), psychogenic vomiting syndrome, pregnancy-induced vomiting, and (2) lifestyle such as chronic alcoholism and binge drinking.

Extrinsic factors that can predispose an individual to the risk of dental erosion have been grouped under the headings of dietary, occupational, medications and lifestyle.

Misuse of acidic dietary products: Acids: Fruits, fruit juices, drinks and beverages have been shown to have a very high level of titratable acids (high H+) and low pH, which is detrimental to the enamel of the teeth. Frequent and prolonged ingestion of these food substances—as is the case with habitual drinker, acid-flavoured candies (e.g., Lucas paste, Lucas powder, chomay pastes), wines, cider, salad dressing, vinegar conserves and acidic herbal teas.

Use of acidic medications: These medications, when prescribed for frequent use over a long period of time, predispose to dental erosion. The following acidic medications may erode potential: ascorbic acid (vitamin C), acetyl-salicylic acid (aspirin), liquid hydrochloric acid, iron tonics, acidic saliva stimulants/substitutes, and products with calcium-chelating properties.

Occupation: Dental erosion has been reported among individuals who are directly exposed to acid fumes or aerosols in their places of work. This includes workers in battery factories, galvanizing factories and fertiliser industries. Competitive swimmers in poorly-maintained gas-chlorinated swimming pools and professional swimmers are directly exposed to the acidic environment. Individual swimmers are at risk of dental erosion.

Life style: Involvement in some habits or activities can predispose an individual to the risk of dental erosion. Certain illegal designer drugs such as cocaine and ecstasy are associated with excessive consumption of acidic beverages due to its side-effects of dehydration and hyposalivation.

Table 1: Summary of prevalence studies of dental erosion.

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>% affected</th>
<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>1–4</td>
<td>20</td>
<td>UK Toddlers Survey, 1994</td>
</tr>
<tr>
<td>4–5</td>
<td>58</td>
<td>Millward et al. 1994</td>
</tr>
<tr>
<td>5–6</td>
<td>52</td>
<td>UK Child Dental Health Survey, 1993</td>
</tr>
<tr>
<td>11</td>
<td>25</td>
<td>UK Child Dental Health Survey, 1993</td>
</tr>
<tr>
<td>11–14</td>
<td>57</td>
<td>Bartlett et al. 1998</td>
</tr>
<tr>
<td>26–50</td>
<td>50</td>
<td>Lussi et al. 1991</td>
</tr>
<tr>
<td>45–50</td>
<td>42.6</td>
<td>Lussi et al. 1991</td>
</tr>
</tbody>
</table>

Step 1: Early diagnosis

Patients can barely detect early enamel erosion due to its smooth and shiny appearance (Fig. 1). Even when detected they rarely seek treatment until it gets to an advanced stage, when it becomes symptomatic (sensitivity) or affects the aesthetics of their teeth. The responsibility of early detection and treatment therefore falls on dental professionals.

Once dental erosion is detected, there is need for a full case history, which should include dietary history, medical history, dental hygiene habits, and lifestyle history. This would establish the etiological factor and help in development of individualized counseling. Following diagnosis of an early lesion or the patient’s susceptibility, the following recommendations may be considered as "damage-limiting" policy as well as a preventive policy.

Step 2: Record the clinical situation

The severity and extent of the wear must be recorded to establish the clinical baseline so that progression can be detected, and the effects of preventive measures assessed. For this, the following techniques are useful.

Guidelines for Prevention & Control

The conditions discussed above as predisposing individuals to the risk of dental erosion highlight the fact that individuals who are susceptible to dental erosion have either psychological or habitual or occupational inclination to the factors predisposing them to the disorder. This would obviously pose difficulty in obtaining full compliance with preventive advice even when the causative factor is identified. However, if implemented, the following steps may prevent occurrence, limit the damage, modify habit or protect the remaining tooth tissue.

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Step 3: Treatment of the underlying medical disorders and diseases

Some patients may not be aware of their underlying medical condition, but in search of treatment for the deteriorating condition of their teeth, the dentist may be the first healthcare personnel to observe the underlying medical disorder. Others may not recognize their condition as a disorder, especially with anorexia/bulimia patients, hence would not seek medical attention until it starts affecting the aesthetics, function or comfort of their teeth. Patients should be referred to the appropriate specialist (doctor or...
It is common practice among individuals to brush their teeth after an acidic challenge, such as consuming citric or tartaric acid, to remove enamel particles. However, long-term erosion damage can be reduced by the remineralization process, which involves the use of substances that can bond with the enamel and help to repair the damage. The process of remineralization is a key factor in preventing further tooth erosion and improving oral health.

When considering the role of remineralization in dental health, it is important to note that the process involves the addition of minerals to the enamel, which helps to strengthen the tooth structure. This can be achieved through the use of fluoride supplements, which are known to be effective in preventing tooth decay and improving enamel quality. Other remineralization strategies include the use of toothpaste containing calcium fluoride, which can help to increase the pH of the mouth and promote the formation of new enamel.

In addition to fluoride, other minerals such as strontium and phosphorus have also been shown to be effective in promoting remineralization. These minerals can be found in foods such as dairy products, which are an important source of calcium and other essential nutrients for maintaining good oral health. It is also important to consider the role of diet in the prevention of tooth erosion, as a balanced diet can help to provide the necessary nutrients for remineralization.

Overall, remineralization is an important component of dental health and can help to prevent further tooth erosion and improve oral health. By taking steps to promote remineralization, individuals can help to maintain healthy teeth and gums and prevent the development of tooth decay and other oral health problems.
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UK scientists find new oral species

Mission of Mercy: USA—A mad dash began before sunrise on Fri-
day as several hundred people, some of whom had been standing in line since 5 a.m. or earlier, raced to position themselves to get to the front of the line for free dental care.

Mission of Mercy, which is sponsored by the Nebraska Dental
Association, Nebraska Dental Foundation, numerous private prac-
-tices, and community organizations, is designed to provide free dental care for all who need it.

Nearly 80 dentists from across Nebraska began arriving early Friday and were greeted by a Scotts Bluff County Events Center filled with folding chairs; rows of dental chairs; special areas for surgery and sterilized equipment; and volunteers and workers who were excited to see as many as 30 patients during the day, Schlothauer said, while others who were doing the same were thrilled to see as many as 15 patients.

“We are really blessed to have the Mission of Mercy,” said Schlothauer, who, despite the cold, was happy to see her patients.

The scope of the free dental clinic was expected to reach into eastern Wyoming, Montana, and Colorado as people found out that free dental care was available.

As he sat in one of the sections waiting for a root canal, an individ-
al who was first in line was in need of extractions.

Some dentists would be able to see as many as 30 patients during
the day, Schlothauer said, while others who were doing the same were thrilled to see as many as 15 patients.

“We can see a lot of patients,” said Schlothauer, who, despite the cold, was happy to see her patients.

Not all activity was based in the community for the past year, seemed to marvel at the efficiency of the volunteers and profes-
sionals who made the system work.

The healthy human mouth is inhabited by 700-800 different species of bacteria. Tooth decay and gum disease are the most common bacterial oral diseases and scientists have linked microbes to chronic conditions like heart disease, diabetes, and gum disease are the most common bacterial oral diseases and scientists have linked microbes to chronic conditions like heart disease, diabetes, and gum disease are the most common bacterial oral diseases and scientists have linked microbes to chronic conditions like heart disease, diabetes, and gum disease are the most common bacterial oral diseases and scientists have linked microbes to chronic conditions like heart disease, diabetes, and gum disease are the most common bacterial oral diseases and scientists have linked microbes to chronic conditions like heart disease, diabetes, and gum disease are the most common bacterial oral diseases and scientists have linked microbes to chronic conditions like heart disease, diabetes, and gum disease are the most common bacterial oral diseases and scientists have linked microbes to 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