

## ORIGINAL RESEARCH

## Dental erosion among school children- A survey

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## ABSTRACT

**Background:** Dental erosion is characterized by the progressive, irreversible loss of dental tissue. The present study was conducted to evaluate dental erosion among 7-14 years school children.

**Materials & Methods:** 350 school children age ranged 7-14 years of both genders were studied for dental erosion evaluated using the Basic Erosive Wear Examination (BEWE), which is scored as follows: 0 = No loss of tooth enamel; 1 = initial loss of enamel surface texture; 2 = Loss of hard tissue (dentin) on <50% of the surface area; and 3 = loss of hard tissue (dentin) on more than 50% of the surface area.

**Results:** Age group 7-8 years had 110, 9-10 years had 100, 11-12 years had 90 and 13-14 years had 50 children. The difference was significant ( $P < 0.05$ ). The mean BEWE score was 0 in 205, 1 in 65, 2 in 50, 3 in 10, 4 in 15, 5 in 3 and 8 in 2 children. The difference was significant ( $P < 0.05$ ). The frequency of intake of acidic foods was 1 time per day seen in 65% and 2 times per day in 35%. Frequency of intake of acidic beverages was 1/day in 58% and 2/day in 42%. The mode of ingesting acidic beverages was with glass in 74% and with straw in 25%. The difference was significant ( $P < 0.05$ ).

**Conclusion:** It is concerning that schoolchildren consume so much acidic food and drink. These poor practises lead to dental deterioration.

**Key words:** Children, Dental erosion, Enamel

## Introduction

Dental erosion, also known as tooth erosion or enamel erosion, is the gradual loss of the outer layer of the teeth, called enamel, due to acid attack. It is a common dental problem that can lead to tooth sensitivity, discoloration, and structural damage to the teeth.<sup>1</sup> Enamel is the hardest substance in the human body and serves as a protective layer for the underlying dentin and pulp of the tooth. However, when acids come into contact with the teeth, they can dissolve the mineral content of the enamel, causing it to weaken and wear away. This process is known as dental erosion.<sup>2,3</sup>

Clinical signs of erosion include wear on the non-occlusal surface, non-tarnished and elevated amalgam surface, cupping of cusp tips, grooving of incisal edges, and a shallow, broad, smooth, wedge-shaped depression within the enamel surface next to the cemento enamel junction. As cup- or bowl-shaped lesions, symmetrical erosive dentine exposures on the cuspal inclines of the molar teeth are known.<sup>4</sup>

The wide range of indices used to assess and record tooth wear or erosion as well as the inevitability of diagnostic criteria change prevent easy comparison of the results of published epidemiological studies. Another challenge is separating wear mostly brought on by acid erosion from that predominantly brought on by abrasion and/or attrition.<sup>5,6</sup> The present study was conducted to assess dental erosion in school children.

### Materials & Methods

The present study was conducted in the department of Community dentistry on 350 school children age ranged 7-14 years of both genders. Ethical approval was obtained from institute prior to the study. All were informed regarding the study and their parents approval was taken.

General data such as name, age, gender etc. was recorded. A careful oral examination was performed using probe, mirror and twizzer. All primary teeth were evaluated for dental erosion. Dental erosion was evaluated using the Basic Erosive Wear Examination (BEWE), which is scored as follows: 0 = No loss of tooth enamel; 1 = initial loss of enamel surface texture; 2 = Loss of hard tissue (dentin) on <50% of the surface area; and 3 = loss of hard tissue (dentin) on more than 50% of the surface area. The vestibular, occlusal, and lingual/palatal surfaces of the teeth were examined. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

### Results

**Table I Age wise distribution**

| Age group (Years) | Number | P value |
|-------------------|--------|---------|
| 7-8               | 110    | 0.82    |
| 9-10              | 100    |         |
| 11-12             | 90     |         |
| 13-14             | 50     |         |
| Total             | 350    |         |

Table I shows that age group 7-8 years had 110, 9-10 years had 100, 11-12 years had 90 and 13-14 years had 50 children. The difference was significant ( $P < 0.05$ ).

**Table II Basic erosive wear examination score**

| BEWE score | Number | P value |
|------------|--------|---------|
| 0          | 205    | 0.01    |
| 1          | 65     |         |
| 2          | 50     |         |
| 3          | 10     |         |
| 4          | 15     |         |
| 5          | 3      |         |
| 8          | 2      |         |

Table II shows that mean BEWE score was 0 in 205, 1 in 65, 2 in 50, 3 in 10, 4 in 15, 5 in 3 and 8 in 2 children. The difference was significant ( $P < 0.05$ ).

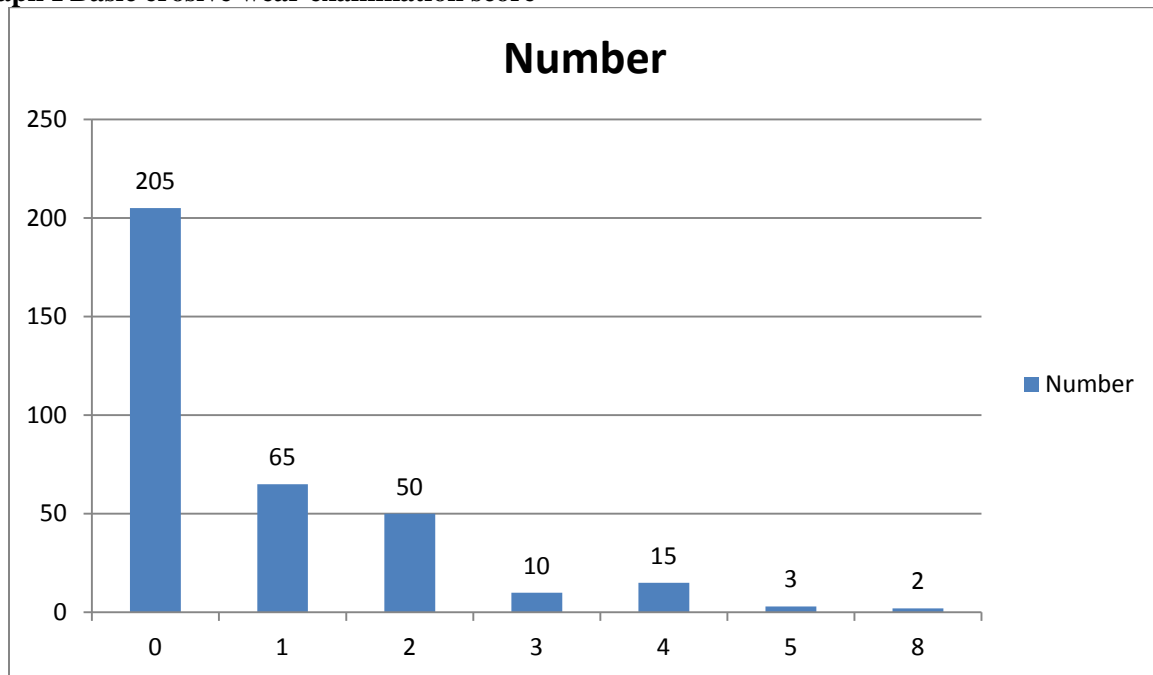
**Table III Frequency distribution of consumption of acidic foods and beverages**

| Parameters                              | Variables  | Number | P value |
|---|------------|--------|---------|
| Frequency of intake of acidic foods     | 1/day      | 65%    | 0.02    |
|   | 2/day      | 35%    |         |
| Frequency of intake of acidic beverages | 1/day      | 58%    | 0.96    |
|   | 2/day      | 42%    |         |
| Mode of ingesting acidic beverages      | With glass | 75%    | 0.01    |
|   | With straw | 25%    |         |

Table III shows that frequency of intake of acidic foods was 1 time per day seen in 65% and 2 times per day in 35%. Frequency of intake of acidic beverages was 1/day in 58% and 2/day in 42%. The mode of

ingesting acidic beverages was with glass in 74% and with straw in 25%. The difference was significant ( $P < 0.05$ ).

**Graph I Basic erosive wear examination score**



## Discussion

Dentistry is aware of the issue of multifactorial tooth wear, which includes abrasion, erosion, and attrition. The dental industry is extremely concerned about it because of its rising prevalence and severity. Dental erosion is defined as the gradual, permanent loss of dental tissue caused by a chemical reaction without the presence of microorganisms.<sup>7</sup> The stomach's acid, which contacts the oral cavity through involuntary regurgitation or, in the case of those with bulimia nervosa, through voluntary regurgitation, is thought to be the cause of this condition.<sup>8</sup> Other potential extrinsic sources of acid include food, beverages, and the workplace. Its aetiology is complex and could be caused by either intrinsic or external acid sources. Gastric acid entering the mouth as a result of gastroesophageal reflux, eating problems, persistent regurgitation, prolonged vomiting, or rumination is referred to as intrinsic.<sup>9</sup> Acidic meals and drinks, prescription drugs, workers in battery and fertiliser factories, sommeliers, lab technicians, environmental acids, and competitive swimmers are all examples of extrinsic acid sources. Additionally, a number of parafunctional behaviours and modifying factors that impact the host greatly increase the susceptibility of teeth to dental erosion.<sup>10,11</sup> The present study was conducted to assess dental erosion among 7-14 years school children.

We found that age group 7-8 years had 110, 9-10 years had 100, 11-12 years had 90 and 13-14 years had 50 children. Millward et al<sup>12</sup> investigation involved clinical examination of 101 children and an assessment of their dietary habits. Evidence of tooth wear was found in over 80% of maxillary incisor teeth, and 30% of primary molar teeth had some dentine exposed. There were 21 children who were regarded as having 'mild' erosion, 45 'moderate' erosion and 35 'severe' erosion. There were highly statistically significant differences between the three groups in relation to drinking habits; the mean number of carbonated drinks consumed per week by children in the 'mild', 'moderate' and 'severe' erosion groups was 3.9, 5.8 and 13.9 respectively, of fruit drinks 10.3, 16.4 and 18.3, and of all fruit-based drinks 17.9, 27.1 and 39.0. There were also highly significant differences in those having a fruit-based drink at bed-time; 14% in the 'mild' erosion group, 32% in the 'moderate' and 60% in the 'severe' group. Although fresh fruit and yoghurt consumption followed the same trend, this did not reveal statistically significant

differences. It is important to identify children who exhibit clinical evidence of erosion so that advice can be given about consumption of acidic dietary constituents.

We observed that mean BEWE score was 0 in 205, 1 in 65, 2 in 50, 3 in 10, 4 in 15, 5 in 3 and 8 in 2 children. Harding et al<sup>13</sup> conducted a study among randomly selected 500 school children aged between 4 and 15 years. The examination was done in a systematic approach, and the degree of tooth wear and scoring were recorded according to modified Smith and Knight Index. Of 500 children examined, dental erosion was seen in 73 (25.17%) boys and 55 (24.09%) girls. 5-year-old children showed 42.10% of dental erosion. 23.93% of primary teeth and 8.55% of permanent teeth had dental erosion. Of the surfaces examined the labial surface of deciduous maxillary central and lateral incisor (32.81% and 28.39%, respectively) and the occlusal surface of mandibular first deciduous molar (26.92%) were affected predominantly. 82 children (64.06%) had low dental erosion, 26 children (20.31%) had moderate erosion, and 20 children (15.62%) showed severe erosion.

The shortcoming of the study is small sample size.

### Conclusion

Author found that it is concerning that schoolchildren consume so much acidic food and drink. These poor practises lead to dental deterioration.

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