

LETTERS TO THE EDITOR

Sports drinks and teeth

EDITOR,—We read with interest the article from Dr Alex Milosevic regarding sports drinks and their purported connection to erosion of dental enamel.¹ Following the publication of this article it has been clear to us that the media, at least here in the United States, have misinterpreted the results of this article.

Although the author states that the enamel erosion observed in one athlete "cannot be attributed unequivocally to the sports drinks," the media has used the article to establish a cause and effect conclusion similar to the article's title, "Sports drinks hazard to teeth." The article provides an analysis of viscosity, mineral content, pH, and buffering capacity of the most popular sports drinks, together with a case report on one athlete who showed signs of enamel erosion on the inside of his top front teeth. While the author states clearly that he has not established a cause and effect relation, clinically and scientifically unsophisticated readers have apparently concluded that acidic beverages are dangerous to teeth.

Most beverages we consume are acidic in nature. This includes soft drinks, fruit juices, coffees, teas, wines, and beers. The reason that such beverages are not dangerous to the teeth is, in a word, saliva, which enables all of us to consume acidic beverages without harm to teeth. Saliva is rich in calcium and phosphate, the primary minerals that comprise tooth enamel. Teeth are constantly undergoing a process of mineral exchange with saliva. Saliva contains numerous protective components such as proteins that coat the teeth, and it contains natural buffers that guard against the potential impact of acid in the mouth. Therefore, enamel erosion tends to occur almost exclusively on tooth surfaces that are deficient in either quality or quantity of saliva or are not reached by its flow pattern, making the condition comparatively rare.

While we appreciate the author's attempt to elucidate the impact that beverages may have on the oral hygiene of athletes, we are concerned that the article's reach has exceeded its grasp. For example, the author's supposition that beverages that are swished or held in the mouth are more likely to cause dental problems may well be true except that sports drinks are not likely to be savoured like a fine wine. By both bottle design and formulation, sports drinks are intended to be ingested as rapidly as possible, effectively minimising contact with teeth. It is far more likely that beverages such as soft drinks, fruit juices, and coffee will linger in the mouth for a substantially longer time than will sports drinks.

In the absence of an appropriate research protocol, we believe that it is unfair, inaccurate, and misleading to posit that sports drinks are harmful to teeth. In the absence of information about the subject's dietary habits, dental hygiene, saliva flow patterns, fluoride intake, and history of enamel erosion, it is impossible to develop a cause and effect link. While the author does state that the

enamel erosion he observed in one patient cannot be "unequivocally" attributed to the consumption of sports drinks, we would take that statement a step further. Enamel erosion cannot be unequivocally tied to the consumption of any specific food or beverage. Based upon the evidence presented in the article, it is far more likely that the athlete developed idiopathic erosion, that which has occurred in the absence of a demonstrable cause and effect.

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1 Milosevic A. Sports drinks hazard to teeth. *Br J Sports Med* 1997;31:28-30.

Author's reply

EDITOR,—Thank you for the opportunity to respond to the letter from Dr Murray, Director at the Gatorade Exercise Physiology Laboratory. There are three points raised in his letter that I would like to discuss.

"Enamel erosion tends to occur almost exclusively on tooth surfaces that are deficient in either quality or quantity of saliva... making the condition comparatively rare".

Dental erosion is not rare and has become an important concern to the dental profession and the food/drinks industry. The latter via ILSI (its science organisation), sponsored a recent international workshop in Belgium,¹ the British Dental Association held a one day conference on "Dental erosion—current science and research needs", and erosion was included for the first time in the 1993 National survey of children's dental health.² Clearly this is indicative of the fact that dental erosion is no longer rare. We reported that 8% of 14 year old schoolchildren in Liverpool had dentine exposed on occlusal and palatal surfaces.³ This level of dentine exposure in teenagers is high.

The relation between saliva and erosion has hardly been investigated although Dr Murray is correct in writing that saliva should protect from erosion. However, I have seen many otherwise healthy subjects with erosion who do not complain of dry mouth/poor salivary flow. More research is certainly needed in this area. Furthermore, there is no research to date associating the site specificity of erosion (mainly occlusal and palatal) with salivary pellicle or function.

"Sports drinks are not likely to be savoured like a fine wine". I have a copy of a cycling magazine in which the correspondent advocated swishing sports drink around the mouth to accelerate the action of salivary amylase (the enzyme that breaks down starch into simple sugars), which suggests that some people may retain such drinks in the mouth before swallowing.

"Enamel erosion cannot be unequivocally tied to the consumption of any specific food or beverage". Given that erosion is a problem (certainly in the UK and elsewhere in Europe) it is incumbent on scientists and clinicians to collaborate and determine the potential causes and their associated risk. Perhaps industry would care to fund such research, which would answer some of the questions raised in this correspondence.

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- 1 Etiology, mechanisms and implications of dental erosion. *Eur J Oral Sci* 1996;104:No 2:part II.
- 2 Office of Population Censuses and Survey. *Dental disease among children in the UK in 1993*. OPCS Monitor. London: OPCS, 1994.
- 3 Milosevic A, Young PJ, Lennon MA. The prevalence of tooth wear in 14-year-old schoolchildren in Liverpool. *Community Dent Health* 1994;11:83-6.

Growth hormone use by body builders

EDITOR,—We read with interest the report by Evans that showed that growth hormone (GH) was used by some 12% of people questioned in his survey.¹

The report did not state the specific formulation being used by the respondents. Since the mid-1980s, recombinant human growth hormone (rhGH) has replaced human pituitary derived growth hormone (pdGH) mainly because of a risk of contracting Creutzfeldt-Jakob disease,² and a possible longer term decrease in the cost of the hormone. The cost of drugs through illicit sources are generally higher than the legal prices, and it is noteworthy that the price quoted for a months' treatment with GH (£400) is virtually the same as the NHS price.¹ The abuse of such an expensive agent may create a market for any unscrupulous practitioner and worryingly, old stocks of pdGH may be entering the black market.

The side effects mentioned by Evans were, in the majority, related to the use of androgenic agents. The complementary agents used (diuretics, tamoxifen, insulin, and GH), however, are frequently associated with side effects. For instance, fluid retention is a frequent effect of GH use, but rarer and potentially more dangerous effects such as benign intracranial hypertension, increasing incidence of melanocytic naevi and hyperglycaemia have also been reported.³ It would seem that the athletes are unaware of many of these non-androgenic side effects, or choose to ignore these risks. Furthermore, although all respondents were male, the side effects encountered by female users may be more prevalent and severe than those encountered by men.

We believe that the widespread use of anabolic drugs and complementary agents exposes the abusers to many potential economic and physical problems of which they may be unaware. Although many athletes may fully understand the complex regimens and anabolic potential of these various agents, greater emphasis needs to be placed on warning them of the potential dangers of their use. Medical practitioners need to be aware of the widespread use of performance improving drugs and specifically warn people of the dangers.

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- 1 Evans NA. Gym and tonic: a profile of 100 male steroid users. *Br J Sports Med* 1997;31:54-8.
- 2 Markus HS, Duchon LW, Parkin EM, Kurtz AB, Jacobs HS, Costa DC, et al. Creutzfeldt-Jakob disease in recipients of human growth hormone in the UK: a clinical and radiographic study. *Q J Med* 1992;82:43-51.
- 3 De Boer H, Blok GJ, Van der Veen EA. Clinical aspects of growth hormone deficiency. *Endocr Rev* 1995;16:63-86.