Orthodontic Products Update

Fluoride Mouthrinses

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Introduction

Maintenance of good oral health is of paramount importance during orthodontic treatment. It is crucial to a successful aesthetic outcome.

Prevention includes not only oral hygiene instruction, toothbrushing, diet counselling, and the appropriate care of orthodontic appliances, but also the recommendation of a fluoride supplement in the form of a gel or a mouthrinse.

A fluoride mouthrinse is an effective adjunct to mechanical cleaning. Its topical effect reduces enamel decalcification and gingival inflammaton, and enhances the remineralization of enamel adjacent to orthodontic brackets (Denes and Gabris, 1991; Boyd, 1992, 1993). The effect, however, stops on cessation of the mouthrinse. In a review article of 30 studies the effectiveness of fluoride mouthrinses was estimated at around 30 per cent reduction in caries (Horowitz, 1980). As a community-based preventative programme, the cost effectiveness of a fluoride mouthrinse has to be questioned and mouthrinses should only be used in populations with a high caries experience (Adair, 1998). On an individual basis in special cases, i.e. orthodontic patients, fluoride mouthrinses can be extremely beneficial (O'Reilly and Featherstone, 1987). Many trials comparing the efficacy of different modes of fluoride supplement have been performed and results show they are all equally successful at reducing caries (Dristoll *et al*., 1982); Blinkhorn, 1983; Seppa and Pollanen, 1987; Stephen, 1990).

In a recent survey, a fluoride mouthrinse was recommended by 73 per cent of orthodontists (Hobson and Clark, 1998). This still leaves nearly one in four orthodontists not giving such a recommendation despite the evidence supporting the benefits of fluoride supplementation.

Available Products

The choice of fluoride mouthrinses is more limited than other products such as toothbrushes. Marketing focuses on caries reduction and their ability to reduce white spot lesions.

The sodium fluoride rinses are available as a 0·05 per cent daily rinse (225 ppm) or a 0·2 per cent weekly rinse (900 ppm). The daily rinse is probably more appropriate for children as it is a smaller dose (see below), and a daily regime becomes more of a routine and less likely to be forgotten. The low dose is sufficient to raise the salivary and plaque fluoride levels to inhibit demineralization.

Stannous fluoride gels (0·4 per cent) are available and are used in the same way as rinses. A comparison found both 0·05 per cent sodium fluoride and 0·4 per cent stannous fluoride to be just as successful in reducing caries (Boyd, 1993). The staining capacity of stannous fluoride still remains.

Concerns

A major problem with the recommendation of fluoride mouthrinses is one of compliance and motivation. Their use is often spasmodic. In a study, only 13 per cent of patients fully complied with the rinsing regime of 0·05 per cent sodium fluoride daily (Geiger *et al*., 1992). The more closely the patients complied with the rinsing regime the fewer white spot lesions developed. Continual motivation is the key to success and the use of auxiliaries may be more cost effective for the busy orthodontist in providing this continual message. Recommendation alone does not improve oral hygiene (Hobson and Clark, 1998).

Fluoride rinses are relatively safe as low levels when used in their prescribed quantities. There is a wide variation in levels that are considered as mildly toxic, sufficient to cause gastrointestinal disturbances and those which would be considered lethal. Probably toxic doses (PTD) of around 5 mg/kg are described (Whitford, 1987).

For a 10-year-old child, estimates are given in Table 1. These doses would be less for a younger child, with PTD for a 20-kg 6-year-old at 430 ml of 0.05 per cent rinse and 110 ml of 0·2 per cent rinse (Wei and Yiu, 1993). An 11-kg 1-year-old would need to consume 247 ml of 0·05 per cent NaF (approximately one bottle). It is therefore essential that all fluoride products have a safety child proof cap. Unfortunately, there are still mouthrinses on the market that do not have these. Instructions need to be given when recommending any fluoride product so that parents are aware they should be kept out of sight in a high cabinet away from the younger children in the family. The alcohol content (alcohol acts as an irritant in dry or sensitized mouths) and the use of colourings may also be a cause for concern in some cases.

Please see separate insert for Product information.

TABLE 1 Estimated toxicity of fluoride mouthrinse (for ten year old)

Lethal dose	G–I disturbances
0·05% sodium fluoride—4174 ml	0·05% sodium fluoride—130 ml
0·2% sodium fluoride—1067 ml	0·2% sodium fluoride—33 ml

Wei and Kanellis, 1983.

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