

Fluorides in Dentistry

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According to the World Health Organisation (1990) dental caries has been known throughout history, but it started to become a significant public health problem in industrialised countries in the later part of the 19th century, when new technology allowed production of large amounts of refined sugars. In early sixties some countries recorded no children who were caries free, DMF-T figures for 12 year olds were as high as 10 -15. Following the introduction of wide use of fluorides of various forms, dental caries experience in industrialised countries decreased since 1970. Yet, despite the remarkable achievements made in the past three decades, the World Oral Health report of 2003, still points out that dental caries remains a major public health problem in most industrialised countries, affecting 60-70 % of school - children and the vast majority of adults (Petersen, 2003).

For many years it was thought that the incorporation of fluorides into enamel crystals during their development made the crystals highly resistant to subsequent acid attack after the tooth had erupted. However, current evidence indicates that systemic fluoride is of less importance than topical fluoride present in the fluid surrounding the crystals during demineralisation and remineralisation (Ekstrand et al., 1988). At present, fluoridated toothpaste is the most commonly used Fluoride vehicle worldwide and many consider it as the most important factor in caries decline (Brian et al., 2002). Not surprisingly, nowadays toothpaste has turned out to be a very practical means of providing large groups of people with a regular supply of fluoride. This breakthrough, complemented by the fact that toothpaste was initially manufactured as a cosmetic product, has attracted many multinational and local companies to invest in the toothpaste industry. As Volpe (1977) puts it; a toothpaste or dentifrice, is a substance used with a toothbrush to clean the accessible surfaces of teeth both for cosmetic and therapeutic purposes. In this case manufacturers might produce toothpaste for either of the purposes as dictated by market forces.

Formulating an effective toothpaste formula requires that fluoride in toothpaste must be made available to the enamel microenvironment in its bioactive form (Hattab, 1989a). In Tanzania Fluoridated toothpaste is manufactured by a number of factories. Nevertheless much of this toothpaste though fluoridated does not contain Fluorides in its free ionisable form, and at therapeutic levels (Palenstein, et al., 2004). Therefore it is important to note that toothpaste may be fluoridated but its fluoride is not ionisable and therefore not available for caries prevention (Itthagnum A. et al., 1997) In this regard efforts must be made to sensitise all stakeholders about this snag and strive for improvement for the pursuit of health.

Fluoride toothpaste must be tested for chemical activity, stability and clinical efficacy. Several factors hinder the release of free ionised fluorides from toothpaste and reduce their clinical efficacy. These factors include; the type of abrasives, the chemical compounds in which Fluorides are incorporated into the toothpaste (DePaola, 1993), and stability over time Hattab (1989b). Calcium abrasives preferentially bind with Fluorides and make them chemically and biologically inactive. Whereas the chemical compounds in which Fluorides are incorporated into the toothpaste determine the ease with which Fluoride ions can be released from the compounds. For instance it was demonstrated that dentifrices containing Sodium Fluoride in Silica base offered more protection than those containing Sodium Monofluorophosphate (Beiswanger et al., 1989; Stephen, 1993; Marks et al.,1995). A fluoride dose response to caries prevention has also been demonstrated (Mark, 1994; Stephen, 1995; O'Mullane et al., 1997; Svante Twetman et al., 2003). However owing to the possibility of swallowing among children and the risk of fluorosis, the low fluoride toothpastes (1000 ppm) are preferred. Monofluorophosphate and Stannous Fluoride although less protective as compared to Sodium Fluoride, these can be combined with calcium abrasives without losing their efficacy, whereas when Sodium Fluoride is combined with Calcium abrasives it loses its efficacy. As for stability with time, the longer the toothpaste stays the less will be the ionisable Fluorides (Oliveira Conde et al., 2003). Considering these facts, and as a matter of principle each manufacturer has to indicate the type and amount of added fluorides to the toothpaste, its available ionisable fluorides, manufacturing and expiry dates. All this information should be liable for periodic checks by recognised independent authorities.

It is now known that regular tooth brushing with fluoridated toothpaste twice a day is a fundamental oral health practice (Yee et al., 2003). However the opportunity to brush twice a day with fluoridated toothpaste is highly dependent on healthy public policies that determine the availability and affordability of fluoridated toothpaste and people's awareness on the importance of brushing. Health promotion emphasises on making healthier choices easier choices, in essence a

healthy choice might be available, but to make it a realistic option for most people requires policy changes affecting its cost, availability or accessibility. This is how public health legislation can have an enormous impact on the nation's health. For such a policy to be successfully implemented, it has to be supported by a public that have been made aware of its importance. It should be a common practise for a dentist not only to educate people to use fluoridated toothpaste, but also prescribe it like any other therapeutic agent. This will enhance peoples' awareness and even sensitise them to support the policy.

It is also advantageous that tooth brushing behaviour is common among Tanzanians, although the effectiveness of the brushing needs improvement (Nyandindi, 1994). Therefore, it will be sensible to promote toothpaste use in a community where tooth brushing is part and parcel of life routines. On the other side of the coin, while this project is primarily geared towards promoting the availability of affordable fluoridated toothpaste, it will also be a great opportunity to mount combined efforts to improve brushing skills, raise people's awareness on the sensible use of sugar and on other oral health detrimental habits. Likewise people have to be educated so that they are empowered to refuse substandard toothpaste brands circulating in the market.

Toothpaste viewed as a cosmetic commodity (Volpe, 1977), is levied with high taxation making it difficult for industries to produce toothpaste at a profit and affordable to most low-income groups of the society. The production costs gets even higher when toothpaste is packed in small containers. Unfortunately, the consumer is the bearer of the brunt of taxation and production costs. Policy makers should be made aware of these socio-economic dynamics underlying the production, packaging, distribution, and affordability of toothpaste with freely ionisable fluorides. Subsequently policies should facilitate the manufacturers to produce toothpaste that will cover much of the population and eventually grant people their right for access to caries prevention.

According to the Ottawa charter for Health promotion (WHO, 1986), Health professionals have to play a mediating role between parties with differing interests for the pursuit of health. The dentist has to play an advocacy role of speaking for the people by uncovering both the social economic and scientific perspectives of availing affordable ionisable fluoridated toothpaste.

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