

AFFORDABLE FLUORIDE TOOTHPASTE (AFT): RELEVANCE AND IMPLEMENTATION STRATEGIES IN INDIAN SCENARIO: A REVIEW

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ABSTRACT:

Dental caries is one of the most prevalent diseases of mankind. It also exerts social, physical, mental and financial burdens on a global scale with developing countries being affected the most. Prevention of dental caries should be the primary aim rather than emphasizing only curative aspects. Affordable Fluoride Toothpaste (AFT) is an efficient tool to create a healthy and clean oral environment. The anti-caries efficacy of fluoride toothpaste has been proven in an extensive series of well-documented clinical trials. The availability and affordability of effective fluoride toothpaste is essential for every preventive programme. WHO recommends for public health that every effort must be made to develop affordable fluoridated toothpastes for use in developing countries. Governments should recognize the enormous benefits of fluoride toothpaste to oral health and should take the responsibility to consider price regulation and achieve equitable availability of fluoridated toothpastes. This literature review (Google search and PubMed) considers the need and beneficial effects of fluoride toothpastes in general and strategies related to the implementation of Affordable Fluoride Toothpaste (AFT) as a community measure for a developing country like India.

Keywords: Fluoride, Toothpaste, Dental caries, Affordable, India



INTRODUCTION:

Dental caries is a global health problem and is one of the most prevalent diseases of mankind. Changes in diets following globalization has contributed to the development of dental caries in emerging economies^[1-4] The burden of tooth decay affects children, adults and the elderly, disrupts life and causes considerable pain, suffering and economic hardship. It also exerts a great financial, social

and psychological impact on those affected by the disease.^[2]

The industrialized nations have experienced a dramatic decline in the prevalence and severity of dental caries among children and adolescents; however in the developing countries the disease still remains untreated, particularly in the low and middle income populations. The reason for the decline of dental caries in the industrialized countries is largely

due to the availability of fluoride (F).^[1,3-5] Since low-income countries cannot afford dental restorative treatment and in general the poor are most vulnerable to the impacts of illness, they should be afforded a greater degree of protection.^[2,5-6]

This literature review (Google search and PubMed) considers the need and beneficial effects of fluoride toothpastes in general and strategies related to the implementation of Affordable Fluoride Toothpaste (AFT) as a community measure for a developing country like India.

GLOBAL AVAILABILITY AND ACCESSIBILITY OF FLUORIDE

By WHO estimates one third of the world's population have inadequate access to needed medicines primarily because they cannot afford them. Despite the inclusion of sodium fluoride in the World Health Organization's Essential Medicines Model List, the global availability and accessibility of fluoride for the prevention of dental caries remains a global problem.^[1,2,4,7]

For many low-income nations, fluoride toothpaste is probably the only realistic population strategy for the control and prevention of dental caries since cheaper alternatives such as water, milk or salt fluoridation are not feasible due to poor

infrastructure and limited financial and technological resources. The use of topical fluoride e.g. in the form of varnish or gels for dental caries prevention is similarly impractical since it relies on repeated applications of fluoride by trained personnel on an individual basis and therefore in terms of cost cannot be considered as part of a population based preventive strategy.^[6-9] Thus, as one of the key components of the WHO endorsed Basic Package of Oral Care, the promotion of affordable and effective fluoride toothpaste is important for improving equity in oral health.^[10]

WHAT IS AFFORDABLE FLUORIDE TOOTHPASTE (AFT)?

WHO endorses the development and use of affordable fluoride toothpaste and defines affordable toothpaste as "one that is available at a price that allows people on low income to purchase it." To date there have not been any attempts to quantify affordability or to suggest a reasonable retail price which consumers might pay for fluoride toothpaste; nor has there been any research to evaluate the effects of affordability, purchasing, and utilisation.^[1,7,11]

The analysis of affordability can be expressed by the cost of the annually recommended dose of fluoride toothpaste as a proportion

of the available household expenditures required to purchase enough toothpaste for one person for one year at the lowest available price. Affordability can also be evaluated by estimating the number of days of work required to buy the recommended dose for one person for one year using the country's per capita annual income (basis 250 working days). According to Health Action International (HAI) a medication costing more than the equivalent of one day's wages is considered unaffordable.^[7]

Variations in retail cost of toothpaste and even of the same brands may occur within countries, between urban and rural markets and between countries due to natural factors (e.g. size of packaging, transportation costs) structural factors (e.g. local taxation and business regulations) and market conditions. Larger retailers or wholesalers can charge lower prices, than small shops; whereas bargaining in street markets may result in lower prices.^[7]

RATIONALE FOR AFT USAGE IN A DEVELOPING COUNTRY SUCH AS INDIA

To-day, India is progressing in all fields, leading to changes in the individual's life-style. Improved marketing strategies and increased transport facilities have brought food materials like bread and

chocolates to even the remotest villages. Moreover, such items are freely consumed as in between snacks. On the other hand, dental diseases are a significant public health burden in India, with dental caries affecting 60 to 65 percent of the general population, depending on age, which is influenced by the lack of dental awareness among the public at large, due to financial constraints and lack of manpower.^[9,11-13]

In a country where 70% of the population lives in rural areas, this has the consequence that they are deprived of the benefits of modern life of which dental health care is an integral part. India also shows an uneven dentist to population ratio of about 1:10,000 in cities and about 1:3,500,000 in the rural interiors. Thus, the only way to reduce caries rates is by the use of fluoridated toothpaste which can act as a simple, robust, easy to service and inexpensive equipment for use in rural surroundings.^[12,14-16] As toothpastes remain too expensive for the majority of the population, there is a need to develop a lower cost, so-called affordable toothpaste. Affordability must be determined relative to the targeted population otherwise accessibility suffers.^[7]

TOOTHPASTES MARKETED IN INDIA

As in many other countries, in India both fluoridated and non-fluoridated toothpastes, as well as other oral care products are marketed. In addition to well known toothpaste companies there are also many local manufacturers who develop various non-fluoride toothpastes and toothpowder formulations and this can make it difficult to keep an accurate account of the total fluoridated dentifrice consumption.^[9,17,18] For example, people in villages in rural areas still do not use toothpastes and toothbrushes but more basic products such as toothpowders, which tend to be non-fluoridated.^[12]

Toothbrushing with fluoride toothpaste controls caries by removing the biofilm from easily accessible surfaces, and by enriching the unremoved remnants of biofilm with fluoride. This has been the basis for the recommended use of fluoride toothpastes aiming at improving oral health. This idea may explain why brushing with a non-fluoride toothpaste, although effective in controlling periodontal inflammation, is not able to significantly reduce caries; to do this, the toothpaste must have fluoride.^[19-21]

BENEFITS AND RISKS OF FLUORIDATED TOOTHPASTE

Decisions concerning the administration of fluoride are based

on the unique needs of each patient, including the risks and benefits (ie, risk of mild or moderate fluorosis versus the benefits of decreasing caries increment and, in some cases pre-venting, devastating dental disease).^[22]

The efficacy of fluoride toothpastes is potentially influenced by several factors, namely: ^[9,14]

- Fluoride concentration;
- Frequency of use;
- Amount used;
- Rinsing behaviour.

There is a strong dose response relationship between increasing fluoride concentration in toothpaste and its clinical effectiveness. ^[22] Toothpastes containing 1,000- 1,500 ppm F (also named conventional fluoride toothpastes) have proven highly effective to control caries, by many high-quality, randomized and controlled studies conducted in the last decades. For example, in Europe the upper limit for fluoride in toothpastes for sale in regular shops is 1,500ppm whilst countries such as India have a maximum permissible limit of 1,000ppm. Toothpastes with increased fluoride concentration (e.g. 5,000 ppm F) have been launched aiming to control root caries, considering that dentine is more caries-prone than enamel.

More studies are necessary to address the effect of 500 ppm F toothpastes, and that lower concentrations (e.g. 250 ppm F) are clearly not as effective as the conventional toothpastes to control caries. [14,16-19,22]

The use of fluoride from toothpaste by young children, resulting in the ingestion of additional fluoride, is the main focus of the growing paranoia on fluorosis. In order to mitigate a small risk of fluorosis that might occur due to excessive fluoride ingestion during the development period of the dentition, the available evidence supports the following advice regarding the use of fluoride toothpaste. [8,9,14,17,22]

- Young children should be supervised when toothbrushing.
- Parents should apply a smear or pea-sized amount (0.25 g) of toothpaste for young children.
- Teeth should be brushed twice a day, one occasion being last thing at night.
- Excess paste should be spat out, not rinsed with a large volume of water.
- The packaging of the fluoride toothpastes should be clearly labeled with the fluoride concentration and the descriptive name of the fluoride compound.

- Production and expiration date should be labeled.

QUESTIONS AND REFLECTIONS ON AFFORDABLE FLUORIDE TOOTHPASTES (AFT) IN INDIA [7,23]

How can access to fluoride toothpaste be measured?

There is apparently a great variation in access to fluoride toothpaste between urban and rural areas. It is important to be able to quantify and compare access, although there are actually no clearly established measurement indicators available. Sales statistics of fluoride toothpaste could be a viable indicator (taking import, export and local fabrication rates into account).

Can Partnerships between other developing countries and multinational toothpaste manufacturers be a way forward?

Some developing countries have negotiated contracts with private companies allowing at the same time private support of public health programmes and promotion of the manufacturer's brands. In Thailand, a partnership with Colgate in the framework of a school-based preventive programme has resulted in the availability of fluoridated toothpaste in virtually all primary schools throughout the country. These toothpastes are sold at lower prices than on the public market

and funds for oral health are implemented in every school. This approach can be used in India and is beneficial for all protagonists, a clear “win-win” situation.

How can one assure the quality of fluoridated toothpastes?

Does low cost imply low quality? This points to the real need for the independent monitoring of the quality of toothpastes. The government should emphasize the availability and manufacture of cost effective and good quality products. There is a need for implementation of stringent quality control measures in developing countries. Independent laboratories using standard methods should carry out quantitative and qualitative analysis, verification of labelling standards, analysis of physical and chemical properties of the paste, analysis of bacterial contamination, and other parameters. In order for the population to be assured that the toothpaste meets certain standards, it is suggested that a quality assurance certification, a “seal of approval” should only be given to fluoride toothpastes that meet appropriate standards for fluoride toothpastes. This could be through the country’s ministry of health, an international dental organisation or perhaps even the World Health Organisation. [9,10,23]

How could we overcome the barriers?

In developing nations like India where the community requires extensive preventive measures due to the poor oral health status and where there is an acute lack of knowledge about the importance of preserving teeth, it is important to use measures that are widespread and do not require radical changes in the daily routine of the people. Brushing teeth using toothpastes is one of the basic methods of oral hygiene measures. The use of fluoridated toothpastes instead of nonfluoridated toothpastes does not require extensive changes in the habits of people and this should be implemented immediately. But, do we have affordable toothbrushes to use toothpaste?

AFFORDABLE TOOTHBRUSHES

In India, a considerable portion of the population does not have access to suitable oral health care and, in many cases, do not control dental plaque in an adequate way because they do not have toothbrushes or because the available ones are worn out or old or even because they share the same toothbrush with other members of the family. [9,12,21] Thus, there is a need to develop a low cost- affordable toothbrush which may be considered as effective as other conventional toothbrushes with respect to the

efficacy in removing dental plaque or fluoridated toothpaste accompanied by a free toothbrush can be considered as a part of marketing strategies by local manufacturers and thus could be a candidate for public health prevention programs in reducing both dental caries as well as periodontal diseases. It is thus suggested that by using toothbrushes and dentifrice, it would be possible to get a combination of chemical and mechanical action in the oral prophylaxis.

SOCIAL MARKETING OF FLUORIDE TOOTHPASTES

In India, the use of toothpastes is not a part of the social culture. One reason has been cost, but if the cost issue can be resolved then how can one influence social culture, so that people purchase and use fluoride toothpaste. Social marketing is an approach adapted and efficient and some of the dental public health approaches used for to increase access to fluoride toothpaste are close to the principles of social marketing. Social marketing has been used for several years and in most cases successfully. Many products sold in developing countries have benefited from this approach, i.e. preservatives, contraceptives and impregnated mosquito nets .What exactly can

social marketing bring to affordable fluoride toothpastes? [7,23,24]

The desire to make quality products affordable and to have a positive impact on deprived populations has led to the development of innovative approaches, i.e. the social marketing.

The concept of social marketing can be outlined as:

- Enable deprived communities to access high quality products or health services at affordable prices
- Promote these products and services with methods used in commercial marketing and IEC (Information, Education and Communication)
- It also is imperative for a local dentist, a volunteer or an NGO to engage themselves in promoting fluoridated toothpaste and make a structured effort towards better oral health.

MEASURES TO MAKE FLUORIDE TOOTHPASTE AFFORDABLE AND ACCESSIBLE [7,9,10,23,24]

1. Equity Pricing

Equity pricing is based on the principle that the poor should pay less for, and have better access to an effective preventive product. The price of fluoride toothpaste should be fair, equitable and affordable, even for poor communities.

2. Removal of taxation and tariffs

Taxes and tariffs on fluoride toothpaste sometimes significantly contribute to higher prices, lower demand and inequity since they target the poor. Toothpastes are usually classified as a cosmetic product and as such often highly taxed by governments. For example, various taxes such as excise tax, VAT, local taxes as well as taxation on the ingredients and packaging contribute to 25% of the retail cost of toothpaste in Nepal and India, and 50% of the retail price in Burkina Faso. WHO continues to recommend the removal taxes and tariffs on fluoride toothpastes. Any lost revenue can be restored by higher taxes on sugar and high sugar containing foods, which are common risk factors for dental caries, coronary heart disease, diabetes and obesity. Along with tax relief on quality fluoride toothpaste, taxation of non-fluoride toothpaste, which has little preventive properties would encourage consumers to make 'healthy choices the easy choices'

3. Generic competition

Generic competition has been a powerful strategy for reducing drug prices and may have the same potential for increasing the availability and affordability of toothpastes.

4. Encouraging local production

The production of toothpaste within a country has the potential to make fluoride toothpaste more affordable than imported products.

5. Inexpensive ingredients and packaging

Approximately 40% of the cost of production of toothpaste is related to the packaging, another 40% to the ingredients and 20% to labour. High quality low cost fluoride toothpaste can be produced using (cheaper) precipitated calcium carbonate without interfering with the in vitro anti-caries efficacy. Many countries use sachet packaging (10 ml) which make fluoride toothpaste more affordable to the poor who cannot afford a one-time expenditure for a larger quantity.

In order to achieve these measures, advocacy by international health organizations such as the WHO and the FDI World Dental Federation, as well as national advocacy by oral health stakeholders, is required.

GLOBAL DEVELOPMENTS

Many Europeans and Scandinavian countries have advocated the use of fluoridated dentifrices for their populations. In December 1999, the project to introduce affordable good quality fluoridated dentifrices was started on recommendation by the Nepal

Dental Association. A set of criteria were established to judge the quality of toothpastes and reduction of taxes on fluoridated toothpastes was proposed. These criteria are now a part of the Ministry of Health's National Strategy for Oral Health in Nepal. Since 1995, Aide Odontologique Internationale (AOI) supports the National Ministry of Health in Burkina Faso in implementing the National Oral Health Plan. [7,9,24-28] The organization helps in the implementation of the widespread use of fluoridated dentifrices. Looking at the promising results obtained in such developing countries it is imperative that such large scale measures are taken in a country like India which faces numerous challenges in the provision of quality oral health at all levels.

CONCLUSION:

The issue of affordable quality fluoridated toothpaste in developing and least-developed countries remains complex. India is a vast country which has diverse social, cultural and geographical backgrounds with limited resources and man power. Western Methods for caries prevention as such will not be successful here and in such a situation fluoridated toothpaste can be seen as a powerful tool to combat and control the spread of dental caries. It is a very real and

worthwhile challenge for the betterment of oral health that needs increased deliberation and exchange of experiences and involvement of universities, NGOs, politicians, manufacturers and international organizations through workshops and symposia. In terms of dental health, increased self-fluoridation using fluoridated toothpaste is a wise investment as an ounce of prevention is worth a pound of cure.

RECOMMENDATIONS

- The support of the dental profession is important and valuable to companies manufacturing and marketing fluoridated toothpastes. There is a need to meet and directly influence key decision makers within manufacturing companies.
- Fluoridated toothpaste accompanied by a free toothbrush should be used as part of marketing strategies by local manufacturers. Also, development of low cost toothbrushes, accessible to public health programs and needy populations, needs to be addressed.
- Television and radio commercials and toothpaste packaging emphasizing the importance of brushing twice a day with fluoridated toothpaste should be done. However, successful promotion of twice-daily brushing with fluoridated toothpaste

targeting the whole population will require a multi-sectoral approach involving the collaborative effort of dentists, the Ministry of Health,

Ministry of Education, toothpaste manufacturers and NGOS .

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