Al Ameen J Med Sci 2016; 9(4):215-218 ● US National Library of Medicine enlisted journal ● ISSN 0974-1143

MINI REVIEW ARTICLE CODEN: AAJMBG

Effects of Miswak - Salvadora Persica on Oral Health

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Abstract: For centuries to improve dental health and to promote oral hygiene plants and plant products in various forms have been used in several communities throughout the world. ''Miswak'' is an Arabic word meaning ''tooth-cleaning stick,'' and Salvadora persica miswak has a wide geographic distribution. It was used by ancient Arabs to whiten and polish the teeth. This review article discusses the history and chemical composition of Salvadora persica miswak and its influence on oral health, including the advantages and disadvantages of its use.

Keywords: Antimicrobial agent, Tooth brushing, oral hygiene, miswak, Salvadora persica

Introduction

Good oral health has a major influence on one's general quality of life and well-being. With the increasing incidence of oral diseases, the global need for alternative prevention and treatment methods and safe, effective, and economical products has expanded. The use of a tooth brush in combination with dentifrices is one of the most common methods of cleaning teeth.

The evolution of the modern toothbrush may be traced to chewing sticks that were used by Babylonians as early as 3500 BC, and to toothpicks that were chewed onto help clean the teeth and mouth and were discussed in ancient Greek and Roman literatures [1]. Chewing sticks are pre- pared from a variety of plant species and are customarily used for cleaning teeth in Asia, Africa, South America, and the Middle East [2]. Western travelers and explorers described the use of chewing sticks by men and women in the Sahara region and Sudan [3].

The inhabitants of these regions would clean their teeth diligently whenever they had a chance to sit down for social gatherings. Chewing sticks are known by different names in different cultures: ''arak'' or ''miswak'' in Arabic, ''koyoji'' in Japanese, ''qesam'' in Hebrew, and ''mastic'' in Latin [3]. The availability, low cost, simplicity, and religious and/or traditional associations of chewing sticks have made them popular through modern times.

Chewing sticks may play a role in the promotion of oral hygiene, and further evaluation of their effectiveness is warranted, as stated in the 2000 World Health Organization (WHO) Consensus Report on Oral Hygiene [4]. ''Miswak'' (synonyms in different Arabic dialects and countries include ''miswaak,'' ''misswak,'' ''miswaki,'' ''meswak,'' ''mswaki,'' ''sewak,'' ''siwak,'' and ''siwaki'') is an Arabic word meaning tooth-cleaning stick [5]. The spread of Islamic culture had a significant influence on the propagation and use of miswaks, which was a pre-Islamic practice, in different parts of the world [3]. Among at least 182 plant species suitable for preparing tooth brushing sticks, miswak harvested from Salvadora persica, are used most extensively [6]. The roots, twigs, and stems of this plant have been used for oral hygiene [2] and small S. persica sticks have been used as toothpicks [7].

S. persica has a wide geographic distribution ranging from Rajasthan (India), Nepal, and Malaysia in the east through Pakistan, Iran, Iraq, Saudi Arabia, and Egypt to Mauritania in the west, and from North Africa through Sudan, Ethiopia, and Central Africa to

southwestern Africa [1, 8]. Taking into account the historical importance of the use of S. persica miswak in the field of oral hygiene, the present review is an attempt to remind readers of the enormous contributions that this practice has made to dentistry, with an input from the most recent lit- erature, and to describe the major aspects of its influence on oral health, including its disadvantages.

Chemical Composition:

Chemical analysis of s.persica miswak has demonnstrated the presence of B-sitosterol and m-anisic acid, chlorides, organic compounds like pyrrolle, pyrrolidine, glycosides such as salvoside, flavonoid.etc. The roots are composed of 27% ash,a high ratio of alkaloids like salvovadine, chlorides, fluorides and vitamins [9-11]. S.persica miswak contains nearly 1.0 mg/g of total fluoride and release significant amounts of calcium and phosphorus into water on chewing, besides it also releases sap which has anticariogenic effect [12-13]. Other compounds isolated from s.persica miswak by various researchers include, BITC (benzylisothiocyanate), which is an end product obtained from hydrolysis of glucosinate present in the plant and it has been found to have both bacteriocidal as well as virucidal activity against Herpes simplex virus [14-15].

Vitamin C and sulphur have been found to aid in tissue healing where as silicon acts as an abrasive and tannins have astringent actions by inhibiting action of glycosyl transferase and thus decreases plaque and gingivitis [16-17]. Salvadorine an alkaloid has bacteriocidal effect, the bitter taste of essential oils stimulates salivary flow which has buffering action and the high content of chlorides inhibits calculus formation and aids in stain removal from teeth [16-18].

Antimicrobial Effects:

Various in vitro studies have showed that the aqueous extract of s.persica miswak has an inhibitory effect on growth of candida albicans owing to its sulphate content [19-20]. It has anti microbial effect on streptococcus mutans and E-faecalis due to interaction with bacteria which prevents its attachment with tooth surface [16, 21].

The anti microbial activity was hypothesized due to the presence of anionic compounds which prevent salivary peroxide thiocyanate and hydrogen peroxidase anti microbial systems .this is the reason why some researchers have recommended the use of s.persica miswak extracts in mouth rinses and tooth pastes owing to its immense antimicrobial property [20, 22-23].

Anti Cariogenic Effects:

It has been found that s.persica miswak has anti-decay effects and in some populations in African and Arabian countries miswak users have shown lower caries prevalence than tooth brush users [24-25]. According to data collected from various studies across the world the incidence of caries in school going children was much less compared to tooth brush users [2, 26]. The pungent smell and chewing effects enhances its buffering capacity by increasing saliva secretion in mouth and raising the plaque PH thus inhibiting growth of cariogenic bacteria [27].

Effect on Dental Plaque and Over all Periondal Status:

Various experts in their studies have found that the use of s.persica miswak effectively reduced gingivitis and dental plaque. They have recommended its use in various preventive dental programmes as its economic and familiar with old people [12, 28].

The combined effect of mechanical cleansing and enhanced salivation achieved with proper use of s.persica miswak was found to be more efficient than tooth brushes in removing dental plaque [27, 29]. In some studies it was concluded that comparing s.persica with chlorhexidine, the anti plaque effect and sub sequent decrease in gingival inflammation was equally significant in both the users [17, 29].

Oral Hygiene:

The value of s.persica miswakis is mainly attributed to its property of mechanical cleaning action, there by decreasing plaque accumulation and gingival inflammation [16]. Miswak is generally used for more duration of time than brush which explains its more

effevtiveness than tooth brush due to mechanical effects of fibers and release of favourable chemicals when chewing stick or combination of both [27, 30-31].

Disadvantages:

Although s.persica miswak is considered to be an excellent aid in maintaining oral hygiene, it also has got its limitations and drawbacks compared to tooth brush which various researchers have mentioned in their studies. As bristles lie in long axis of tooth compared to perpendicular pattern in brush it is always difficult to reach the lingual surfaces of teeth. As it is used for more duration than brush particularly in anterior teeth, it excessively scrubs the tooth surfaces and causes gingival recession [8, 32].

Conclusion

Based on our review of literature, we conclude that the use of s.persica miswak as an oral hygiene aid is very effective. Various clinical studies have demonstrated the beneficial effects of s.persica miswak in maintenance of oral health and periodontal status of teeth. Thus we recommend the use of s.persica miswak along with tooth brush and paste in superior oral health and hygiene owing to its low cast, easy availability and simplicity in use.

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