

A Review on the Effects of Water Pipe Smoking on General and Oral Health

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Abstract

The prevalence of water pipe smoking is continuously increasing over time, becoming a worldwide health concern. It is perceived as a pleasant, flavored tobacco that is harmless to one's health; however, this misconception has infiltrated itself into society, ubiquitously affecting the adult and youth populations. Evidence has shown that water pipe smoking is strongly associated with several short-term and long-term health risks. Its effects on general and oral health have been and continue to be investigated. Several studies have correlated water pipe smoking with systemic effects and diseases, involving the cardiovascular and respiratory systems, cancerous lesions, pregnancy, and periodontal and oral diseases. This paper will review the effects of water pipe smoking on general and oral health through various studies and literature reviews.

Keywords: Water Pipe Smoking (WPS); Oral Health

Introduction

Water pipe smoking (WPS) is a type of smoking that is well known in Middle Eastern countries. Also, it has different names such as Argila, Hookah and Sheesha. In the last few years, WPS has been increasing in popularity. The younger generation accounts for about 100 million of WPS users [1].

Nowadays, there is a common misconception regarding the use of WPS. It's commonly misconceived that WPS does not cause any health hazard and it is safer than cigarette smoking (CS). On the contrary, a large amount of evidence contradicts this misconception. Many studies have reported the systemic effects of WPS in body systems including Cardiovascular System, Respiratory System, Cancer lesion, Pregnancy, and Periodontal and Oral Diseases.

Systemic effects of WPS

Cardiovascular System

According to many clinical studies, WPS has a harmful effect on the cardiovascular system including an increase in heart rate [2-4] and blood pressure [5]. On the other hand, Other study found a weak long-term association between WPS and an increase in heart rate and blood pressure [6].

Respiratory System

The effect of WPS on the respiratory system has been investigated in many other studies. It has been reported that there is an association between WPS and increase in respiratory rate (RR) compared to a non-smoker, which ranges from 2 - 3.5 breathes per minutes after

30-45 minutes [7-10]. No consensus in literature was found in regards to the association of WPS to COPD [11-13]. Furthermore, Waked, *et al.* 2009 reported an association between WPS and asthma [14] and it was supported by Parasuramalu, *et al.* 2010 [15]. However, this association is still based on weak evidence or remains inconclusive.

Cancer lesion

Wu, *et al.* 2013 reported that WPS users have a 2.5 times higher risk of cancer lead to death compared to non- WPS users [16]. However the results from this study were not conclusive due to the test subjects additional usage of other types of smoking, such as cigarette or beedi. Thus, the determination of the effects of WPS, solely, was impossible.

While several studies supported an association between WPS and lung cancer [17], more controlled clinical trials are needed in order to elucidate this relationship. Moreover, an association between WPS and esophageal cancer has been reported as well [18]. Weak evidence claims an association between WPS and bladder cancer [19,20] in contrast to cigarette smoking [21]. Last but not least, the evidence for an association of WPS with other cancers, such as prostate [22], pancreatic [23], colorectal [24] and nasopharyngeal carcinoma [25,26] is very weak.

Pregnancy

Conflicting results were reported regarding an association between WPS and obstetric and perinatal complications including low birthweight (lbw). While in both Tamim, *et al.* 2008 [27] and Abusalah, *et al.* 2012 [28] it has been reported there is association [27], this association was contracted by Nuwayhid, *et al.* 1998 [29].

In Abusalah, *et al.* 2012, passive WPS was also reported that is associated with lbw, independent of cigarette and wood fuel smoke [28]. An overall 2.12 times greater chance of lbw in association with WPS was reported in Akl, *et al.* 2010 [30]. Nonetheless, larger controlled clinical trials are still needed.

Periodontal Disease

Several cross-sectional studies performed in the Middle East evaluated periodontal disease progression in WPS users. In Natto, *et al.* 2005, the prevalence of bone loss was significantly greater in WPS and cigarette smokers compared to non-smokers. Also, the relative risk for bone loss after age adjustments in WPS and cigarette smoking were 3.5 fold and 4.3 folds elevated respectively and it was concluded that WPS has detrimental effect in bone height as significant as cigarette smoking [31]. The results of this study were supported by other studies including Shihadeh 2003 [3], Feldman, *et al.* 1983 [32] and Krall, *et al.* 1999 [33]. Though, the height of the alveolar bone is not 100%, even under healthy conditions as determined in young healthy adults (90 - 95%) [34].

Another report (Natto, *et al.* 2005) evaluated the effect WPS in probing depth (PD). The study included 262 subjects after age controlling [31]. It was concluded by this report that WPS has a significant effect in PD comparable to cigarette smoking. Also, there was a significant reduction in bleeding on probing (BOP) among WPS and cigarette smokers compared to non-smokers [35]. On the other hand, no difference in term of microflora among the groups was reported [36]. Moreover, the prevalence of vertical bony defects among WPS is more significant than cigarette smokers and non-smokers [37].

Dry Socket

The effect WPS in the extraction socket of third molars was evaluated in Al-Belasy, *et al.* 2004. It was concluded that WPS, compared to non-smokers, had a three times increased risk for developing dry socket. There was also no statistically significant difference in risk of dry socket development between WPS and cigarette smokers. Lastly, it has been reported that increasing the frequency of smoking during the day of surgery significantly increased the incidence of dry socket [38].

Oral Lesions

There is some evidence that supports the link between WPS and oral lesions. Dangi, *et al.* 2012 reported that WPS was associated with a greater referral rate for oral lesions suspicious for cancer [39]. And it was contracted by Al-Attas that found insignificant or weak associations with suspicious oral lesions [40] and leukoplakia [41]. As a result, the evidence on the association of WPS and oral lesions remains inconclusive.

Conclusion

Contrary to the widely known misconception, WPS is associated systemic and local adverse health effects. The evidence is still inconclusive in some areas; more long term studies are required to accurately evaluate risks of WPS in Periodontal and Oral health.

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