

## Waterpipe (shisha) smoking: a brief review of prevalence and health effects

### 1. Introduction

Waterpipes, also known as shisha, hookah, narghile, goza or “hubble bubble” pipes, have traditionally been used to smoke tobacco in Africa and Asia, particularly in the Middle East, for at least four centuries. In recent years there has been a global resurgence of waterpipe smoking, with an increase in the number of shisha bars opening in the UK.

Waterpipes normally consist of a head, body, water bowl and hose. Tobacco is placed in the head and often covered with perforated aluminium foil. Burning charcoal is placed on top of the foil. Water is placed in the bowl, submerging a tube through which smoke leaves. Sucking on the hose causes a vacuum in the air space above the water, causing smoke to pass through the water producing bubbles. The size of the waterpipe, number of hoses and other features may vary (ASH, 2010).

Waterpipe smoking is often a social activity and waterpipes will be shared, with the same mouthpiece passed from one person to another. The tobacco is often flavoured or sweetened (with flavours such as apple, mint, chocolate and cappuccino), this may explain why it is popular among the young and among those who otherwise would not use tobacco will begin to use waterpipes. In some parts of the world it is not uncommon for children to smoke with their parents (WHO, 2005).

Traditionally, high prevalence rates of smoking shisha occur in the North Africa, Eastern Mediterranean, and South East Asia regions. However, in recent years the practice has steadily spread throughout the world, with an increase in Western countries particularly among college/university students and young people (Akl et al, 2011; WHO, 2005). This is partly explained by misconceptions of the relative safety of water-pipe smoking and in particular the common mistaken belief that the water in the bowl and the mouthpiece filter out the harmful effects from the smoke. The social aspect of waterpipe smoking may also be a factor which appeals to this particular group. (WHO, 2005).

Most research on prevalence has been at an international level, and evidence for the UK is limited. One survey (Jawad et al, 2013) of 489 London medical students showed that waterpipe smoking was almost twice as common as cigarette smoking among regular smokers (11% compared to 6.3%). More than half of all the students (51.7%) had tried waterpipe smoking. An earlier study (Jackson and Aveyard, 2008) at Birmingham University found that 38% of students had tried shisha and 8% were regular smokers (compared to 9.4% prevalence for cigarette smoking).

Although local data on the prevalence of waterpipe smoking is not currently available a 2009 survey of 62 Arabic Westminster residents found that 44 (72%) smoked waterpipes, with 25 classifying themselves as regular smokers. Thirty-nine out of the 44 (89%) smoked both cigarettes and waterpipes. The authors report anecdotal evidence that suggests an increase in the number of young girls smoking in Westminster (One Deep Breath, 2009).

## 2. The health effects

While water-pipe smoking has not been studied as extensively as cigarette smoking, there is emerging evidence that it is associated with many of the same risks, and indeed may possess some additional risks.

Waterpipe smoking is not a safe alternative to smoking cigarettes. Even after the smoke is passed through the water it still contains high levels of toxic compounds known to cause lung cancer, bladder cancer, oral cancer, clogged arteries and heart disease, and other diseases (Center for Disease Control Prevention; WHO, 2005). Like other tobacco products it also contains the addictive drug nicotine, suggesting that regular shisha smokers may become dependent and experience withdrawal symptoms when they try to quit. In addition, heat sources used to burn the tobacco (such as charcoal) produce their own toxicants, including high levels of carbon monoxide (WHO, 2005; WHO, 2008).

The smoothness of the smoke from a waterpipe may encourage deeper inhalation and greater exposure to tar, carbon monoxide, heavy metals, and nicotine.

In a 2010 systematic review (Akl et al), the authors assessed the association between waterpipe tobacco smoking and health outcomes. Twenty-three observational studies were included and although most were rated as low or very low quality, the results found a significant association between waterpipe smoking and lung cancer, respiratory illness, and low birth-weight (all over twice as likely compared to not smoking). There was also a significant association with periodontal disease (three to five times as likely). Respiratory disease was defined as perennial rhinitis including nasal congestion and wheezing. The findings further suggest an association with bladder cancer, nasopharyngeal cancer, oesophageal cancer, oral dysplasia and infertility, although these were not statistically significant and could have been chance findings.

A review of six studies (Raad et al) found that compared with non-smokers, waterpipe smoking was associated with a statistically significant reduction (4.04%) in FEV1, a measurement in lung function, suggesting that waterpipe smoking is a risk factor for chronic obstructive pulmonary disease.

As a social and recreational activity, sharing a waterpipe mouthpiece also poses a serious risk of transmission of communicable diseases including tuberculosis, herpes and hepatitis (Maziak, 2011; Millward and Karlsen, 2011; One Deep Breath, 2009; WHO, 2005).

Not only are waterpipe smokers at risk from the same kinds of diseases as caused by cigarettes, but the mixture of the tobacco smoke and smoke from the fuel poses similar health risks for passive smokers. There is particular concern over waterpipe smoking in the home where children may be affected, with the Westminster study finding that 46% of waterpipe smokers reported children living in their house and that they smoked in the same room (One Deep Breath, 2009).

Although there is a lack of research into the health effects of second hand smoke specific to waterpipe smoking, the evidence concerning the health risks for passive smokers is well documented. Short term effects include eye irritation, headaches, coughs, sore throats, dizziness, and nausea. Longer term, passive smoking can lead to lung cancer and ischaemic heart disease in adults, and to respiratory disease, cot death, middle ear infections and asthma attacks in children. There is some evidence of an association with stroke, tuberculosis, and a susceptibility to infectious diseases such as pneumonia (ASH, 2011).

There is recent evidence that water pipe smoking is used as a replacement by cigarette smoker who are trying to quit, and is also a gateway into cigarette smoking for young people (Maziak, 2011).

### **3. Comparison between waterpipe and cigarette smoking**

The evidence confirms that water-pipe smoking carries many of the same health risks as cigarettes. The Center for Disease Control Prevention highlights some of these comparisons:

- Water pipe smoking delivers the addictive drug nicotine and is at least as toxic as cigarette smoke
- The mode of smoking (frequency of puffing, depth of inhalation, and length of the smoking session) means that waterpipe smokers may absorb higher concentrations of toxins found in cigarette smoke
- A typical 1-hour-long hookah smoking session involves inhaling 100–200 times the volume of smoke inhaled from a single cigarette.
- Hookah smokers are at risk for the same kinds of diseases as are caused by cigarette smoking, including oral cancer, lung cancer, stomach cancer, cancer of the oesophagus, reduced lung function, and decreased fertility.

In the first controlled laboratory analysis comparing waterpipe and cigarette smoking, Eissenberg and Shihadeh (2009) found that a 45 minute waterpipe smoking session generated over 40 times the smoke volume of a cigarette. There was an associated increase in carbon monoxide in the blood - three times as much as a cigarette at peak levels, but four times as much in the first 5 minutes of a smoking session. Although peak nicotine levels were similar the authors noted that due to the longer duration of a shisha smoking session the participants were exposed to 1.7 times the nicotine dose compared to a cigarette.

### **4. Interventions**

Given the paucity of good quality evidence on the prevalence and health risks of shisha it is perhaps no surprise that research on effective interventions for waterpipe smoking cessation is also lacking. This is highlighted in a 2007 Cochrane systematic review by Maziak et al (reviewed as up to date in 2011), which failed to identify any completed intervention trials targeting waterpipe smokers.

### **5. Evidence on waterpipe smoking in Westminster**

To date, local evidence on waterpipe smoking is very limited. Research commissioned by Westminster PCT (One Deep Breath, 2009) found that the Edgware Road area was the epicentre for public waterpipe smoking, with smokers comprising of both local residents from cultures with a tradition of waterpipe smoking as well as tourists travelling to the area for this purpose.

The report highlighted the lack of research (particularly in the UK), but that the existing evidence shows that waterpipe smoking carries at least the same risks as cigarette smoking. There is a common misconception, however, that it is less harmful than cigarettes and there is a lack of awareness of the short or long term health effects.

There is also a lack of local prevalence data (described above). However, the report did identify particular segments of the Westminster residents for who waterpipe smoking is important, namely youth groups and Arabic families.

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