

TOBACCO USE ASSESSMENT: WHAT EXACTLY IS YOUR PATIENT USING AND WHY IS IT IMPORTANT TO KNOW?

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This article was presented as part of the 2007 International Society on Hypertension in Blacks (ISHIB) lifestyle modification workshop focusing on smoking cessation. The three objectives addressed included 1) identification of the known and little-known health effects of cigarette smoking (eg, endocrine effects on the hypothalamic-pituitary axis, thyroid gland, adrenal glands, and gonadal and reproductive function), 2) examination of the growing trends of nontraditional forms of tobacco, (cigar and water pipe smoking), and 3) identification of the importance of assessing your patients' tobacco use by asking additional tobacco screening questions of all patients, but particularly with youth and young adults. In addition, clinicians and practitioners are encouraged to increase educational efforts that address the myths that alternative forms of tobacco use, such as cigars and water pipes, are safe alternatives to cigarettes. (*Ethn Dis.* 2008;18:S3-1-S3-6)

Key Words: Tobacco Use Assessment, Cigar Smoking, Water Pipe Smoking

SIGNIFICANCE OF CIGARETTE SMOKING

Cigarette smoking results in increased risk of heart disease, chronic obstructive lung disease, and cancer of the lung.¹ Since the first Surgeon General's report on cigarette smoking in 1964, there have been an estimated 12 million deaths due to smoking in the United States; another 25 million Americans are expected to die from smoking-related illness if current use rates continue. In 2004, the Surgeon General released a comprehensive report on smoking and its health consequences, revealing for the first time that smoking causes diseases in nearly every body organ.¹ In 2005, nearly 147,000 Americans died from smoking-related cancers, including cancers of the lips, oral cavity, esophagus, stomach, pancreas, larynx, trachea, lung and bronchus, cervix, kidney, and urinary bladder.²

LESSER-KNOWN HEALTH CONSEQUENCES OF CIGARETTE SMOKING

Despite the widespread knowledge of the aforementioned disorders due to smoking, a number of studies have demonstrated other, lesser-known health effects that are a result of exposure to cigarette smoke, such as endocrine changes. For example, nicotine-induced endocrine changes include alterations in the hypothalamic-pituitary axis, the thyroid gland, the adrenal glands, and male and female reproductive functioning.

Nicotine has been shown to be a potent activator of the hypothalamic-pituitary axis.³ Circulating adrenocorticotrophic hormone has been reported to

increase in persons who smoke intensely,⁴⁻⁵ but the exact mechanism is not well established.⁶ Brainstem catecholaminergic regions in the paraventricular nucleus have a dose-dependent sensitivity to nicotine, in which nicotine-stimulated catecholamine release affects pituitary secretion directly.⁷ Nicotine also increases prolactin release⁸ and plasma levels of vasopressin, which leads to symptomatic hyponatremia.⁵ In contrast, chronic nicotine exposure is believed to inhibit forebrain β -endorphin biosynthesis⁹ and neuronal activity that regulates eating, which results in reduced body weight.⁸ Cigarette smoking has also been studied for its effects on modulation of the circadian system.^{10,11}

The effects of cigarette smoking on thyroid functioning are mixed and inconclusive;^{12,13} results show both anti- and pro-thyroid effects. The dual effects are likely due to components of cigarette smoke such as nicotine, thiocyanate, and benzpyrene and their effects on thyroid hormone synthesis¹⁴ and excretion and inhibition of iodine by the thyroid gland.^{15,16} Smokers with subclinical hypothyroidism have higher mean serum thyrotrophin and a higher ratio of serum triiodothyronine to serum free thyroxine, which contributes to clinical manifestations.¹⁷ Smoking is also a risk factor for Graves hyperthyroidism, especially Graves ophthalmopathy¹⁸⁻¹⁹ but not for chronic autoimmune thyroiditis.²⁰ The evidence is inconclusive regarding the association between smoking and thyroid nodularity; the prevalence of thyroid multinodularity and goiter is increased in smokers, but not singular nodules.²¹ Epidemiologic studies have found a small inverse association between thyroid cancer and cigarette smoking; long-term smokers have a moderately reduced risk of thyroid cancer.^{22,23}

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Smoking and exposure to environmental tobacco smoke during pregnancy are associated with adverse pregnancy outcomes including low birthweight, intrauterine growth retardation, premature delivery, spontaneous abortion, placental abruption and previa, ectopic pregnancy, and perinatal mortality.^{1,24,25} Negative perinatal outcomes are dose-related, from active and passive smoke exposure, which results in less rapidly metabolized nicotine during pregnancy²⁵ and passage of nicotine metabolites through the placenta.²⁶ Alterations in infant thyroid volume and functioning have been identified in newborns²¹ and may continue for up to one year with continued exposure to smoke after birth.²⁷ Hyperthyroid functioning results in pituitary changes that cause increased metabolic rate and oxygen consumption that may result in fetal growth retardation.²⁸ In contrast, women who stop smoking before 30 weeks of gestation generally have healthier as well as average birthweight infants.²⁵

Although little is known about the effect, studies have reported that cigarette smoking has a negative effect on bone mass,²⁹ perhaps resulting in increased risk of fractures.³⁰ Cigarette smoking also increases the risk of developing diabetes mellitus.³¹

CIGAR SMOKING

The second objective of this workshop presented at ISHIB2007 was to examine the growing trends of nontraditional forms of tobacco use, particularly among youth and young adults. It focused on the growing use of cigars and water pipes.³²⁻³⁵

Cigars, a tightly rolled bundle of aged, air-cured, and fermented tobacco, originated in the Caribbean islands >1000 years ago. Cigar use peaked in the United States during the early 20th century and was once more popular than cigarette smoking. Cigar smoking

decreased around 1973, which coincided with tobacco advertising bans on radio and television. As a consequence of the low cigar smoking rates, national survey questionnaires removed questions on cigar use, which resulted in sparse data on use.³⁶ Sales of cigars in the United States increased by 50% between 1993 and 1998 to nearly 4.5 billion³³ in response to increased advertising and promotion of new cigar brands. Tobacco companies promote cigar smoking as pleasurable, a symbol of status, wealth, and class.³⁴

Properties of Cigars

A number of newer cigar products marketed today include cigarillos, cheroots, tipped pipe cigars, and mini blunts, which vary in size and shape. The most popular is the cigarillo, a short, narrow cigar that can be purchased alone or in packs, is available with and without filters, and is usually smoked in quantities similar to cigarettes (5-10 per day).³⁴ Unlike cigarettes, cigarillos are wrapped not in paper but in whole-leaf tobacco and are not meant to be inhaled but smoked like a large cigar. Cigarillos contain fewer additives than cigarettes. A cigarillo contains ≈ 3 g tobacco, the length varies from 7 to 10 cm, and the diameter ranges from .5 to .8 cm. Comparatively, a cigarette contains <1 g tobacco and is <12 cm in length and <1 cm in diameter. Large cigars contain 5-17 g tobacco; the equivalent of approximately two-thirds of a pack of cigarettes.³⁴ Therefore, the nicotine in the smoke of a single cigar varies from an amount similar to a single cigarette to that of nearly smoking an entire pack of cigarettes.³⁶ Cigarillos, in contrast to large cigars, are machine-made, which makes them cheaper.

Health Consequences of Cigars

While there is no universal agreement on how to classify the health risks given the various types and sizes of cigars available today, it is generally

accepted that the health risks increase with the rate of exposure.³⁴ Cigars contain many of the same carcinogens found in cigarettes; they cause cancers of the lung, oral cavity, larynx, esophagus, and pancreas.^{32,37} One to two cigars per day doubles the risk of oral cancer and esophageal cancer; three to four cigars per day increases the risk of oral eight times and the risk of esophageal cancer four times that of nonsmokers.^{32,34,36,37}

The health risks for occasional cigar smokers, less than daily, are unknown.³² Cigar smoke, when inhaled, is more irritating than cigarette smoke;³² those who inhale increase their risk for coronary heart disease, aortic aneurysm, and chronic obstructive pulmonary disease.^{33,38} Cigar nicotine dependence is influenced by a number of factors, including age of initiation, duration of exposure, tolerance and rate of absorption to nicotine, and degree of inhalation. Comparatively, the average nicotine content of a cigar is 100-444 mg, depending on the cigar size and amount of tobacco, while the average nicotine content of a cigarette is ≈ 8.4 mg.³⁹ The long aging and fermentation process, coupled with higher amounts of tobacco in cigars, results in high concentrations of nitrogen compounds (eg, nitrates and nitrites), which give off tobacco-specific nitrosamines when smoked.^{34,36} In addition, the cigar wrapper, a tobacco leaf, is less porous than cigarette paper, which burns less completely resulting in higher concentrations of nitrogen oxides, ammonia, carbon monoxide, and tar, all harmful human carcinogens.^{34,36}

Smoke from cigars contains the same toxins and irritants (eg, carbon monoxide, nicotine, hydrogen cyanide, and ammonia) and carcinogens (eg, benzene, nitrosamines, vinyl chloride, arsenic, and hydrocarbons) as cigarettes but at higher concentrations when equal amounts of tobacco are burned.³⁴ Cigar smoke dissolves more easily in saliva than does cigarette smoke, so the smoker may absorb sufficient nicotine

to satisfy his cravings without needing to inhale.^{34,39}

Growing Popularity of Cigars

The popular trend of cigar smoking, especially among young adults, is fueled in part by efforts of the tobacco industry to glamorize cigars by photographing actors and athletes smoking cigars. Teens and young adults may be vulnerable to these ads and the myth that cigars are a safe alternative to cigarettes. Current cigar use among American teens is higher than that of smokeless tobacco use.³² Approximately 5% of middle school students and 13% of high school students had smoked cigars or cigarillos on at least 1 of the past 30 days. Boys (18%) were more likely than girls (8%) to smoke cigars. Cigar use among American college-aged students, particularly young adult men (18–24 years), is increasing. In 2004, ≈13% of this age group had smoked a cigar in the past month, compared to 5% of those aged ≥26 years. An additional concern with cigar smoking among youth and young adults is “blunting,” which involves removing filler tobacco from the cigar and replacing and smoking it with marijuana or other illicit drugs.⁴⁰

WATER PIPE SMOKING

Water pipe smoking (WPS), also called *narghile* or *argile*, *gaza* or *gouza*, *bouri*, *hookah*, *hubble-bubble*, *nag*, *okka*, *kalian*, and *sheesha* or *shisha*, has a long traditional ethnic and cultural history as a form of tobacco use in India, Afghanistan, Pakistan, the Middle East, Southeast Asia, and North Africa,^{41–43} particularly among elderly and retired men.⁴¹ While WPS declined during the past century, researchers have identified a resurgence of use, particularly among youth and young adults.^{41,42,44} Factors contributing to this resurgence include the myth that WPS is not as dangerous or as addictive as smoking cigarettes,

tobacco for water pipes costs less than cigarettes,⁴¹ and WPS accessories, equipment, tobacco products, sales and monitoring are not well regulated.⁴⁵ In addition, those who smoke water pipes believe them to be more pleasant tasting and less harsh than smoking cigarettes.⁴⁶ More than 1 million people in Asia, Africa, and the Middle East and >100 million people worldwide smoke water pipes daily.^{47,48}

Modern water pipes vary in size, shape, color, and composition. Water pipes consist of a head or bowl (where a special moist tobacco called *tabamel* or *ma'assel* is placed and burned along with charcoal and flavored additives such as molasses and honey), a body (which sits on top of the bottle and is partially filled with water), a glass bottle, and a flexible connecting tube with a detachable mouthpiece. Water in the body is used to clean soot produced when tobacco is burned; it is believed to reduce some of the harmful byproducts (eg, acrolein, aldehydes) of burning tobacco. Consecutive inhalations are necessary to inhale the smoke and to keep the tobacco burning. Other additives used with WPS include alcohol and various drugs.⁴⁷ Water pipes cost anywhere from \$10.00 to hundreds of dollars depending on how elaborate the unit is. Examples of accessories include mouthpieces (\$7.00 for 100), tobacco bowls (\$10.00 for double clay bowls), hoses (\$18.00 for elaborate hoses), and flavored tobacco (50 g costs ≈\$2.50; examples of flavors available include apple, chocolate, cola, grape, kiwi, and mint). A small amount of tobacco may last for weeks, depending on the number of smokers per session and the number of bowls used.

Compared with cigarette smoking, WPS is characterized by less frequent exposure (one to four sessions per day) but more intense exposure per session. The uptake of tobacco nicotine is equivalent to 2–12 cigarettes per “head” of tobacco used. Regular water pipe smokers smoke several heads per ses-

sion. A 45-minute session delivers 36 times more tar, 15 times more carbon monoxide, and 70% more nicotine than a single cigarette.⁴⁹ A 60-minute session is the equivalent of smoking 100–200 cigarettes.⁵⁰

Health Consequences of WPS

Limited research exists on the health risks of WPS. However, evidence suggests that WPS carries the same health risks as cigarette smoking. WPS also carries the additional risks from charcoal, which adds carcinogenic hydrocarbons and heavy metals to smoke. The heat produced during the smoking session is sufficient to generate carcinogenic nitrosamines.⁴¹ WP smokers are five times more likely than nonsmokers to have gum disease;⁵¹ increased risk of cancers, including of the lips, mouth, lung,^{52,53} bladder;⁴⁴ coronary artery disease;^{44,54} hematologic changes, including increased leukocyte count, chromosomal anomalies, and abnormal platelet function;⁴⁸ and reproductive and perinatal risks such as infertility and low birthweight.⁵⁵ Finally, water pipe smokers have an increased risk for infectious diseases, including tuberculosis, viruses, hepatitis, and herpes.⁴⁴

Water Pipe Use

Most studies on WPS have been conducted among Lebanese, Kuwaiti, and Syrian adults^{44,56–58} or college-aged students.^{59–61} WPS rates ranged from 14.6% to 62.6% among adult men and 25% to 69% among adult women. WPS by women is generally more acceptable than cigarette smoking.⁶² WPS experimentation rates ranged from 32%⁵⁹ to 62.6%⁶⁰ among college-aged male students and ≈30% for female students; current use was 26% for men and 5% for women.

Limited studies have been conducted on WPS among youth; only five studies were found. WPS was studied in middle and high school students in Israel,⁶³ Egypt,⁶⁴ Lebanon,⁶⁵ and Iran.⁶⁶ WPS rates were 19% in rural

Egyptian students, 24% in Lebanon, 41% in 12 to 18-year-old Israeli students, and 64% in Iran; differences in WPS rates were noted for boys and girls^{64,66} as well as by grade.⁶³

In a clinic and school-based sample of 1671 Arab American youth from the Midwest, 27% of the youth reported experimenting with WPS; experimentation ranged from 23% at 14 years of age to 40% at 18 years of age.⁴² Tobacco use by friends and family were the strongest predictors of WP experimentation (OR 2.04, $P=.05$; OR 1.99, $P=.05$). WPS was the strongest predictor for experimenting with cigarettes; adolescents were 8.42 times more likely to experiment with cigarettes and 2 times more likely to be current smokers if they smoked water pipes.

A larger, school-based sample of 2504 Arab American and non-Arab American youths, 14–18 years of age, completed a 25-item tobacco use questionnaire that included WPS questions.⁶⁷ Seventy percent self-identified as Arab American; 30% were non-Arab American, primarily Caucasian. Mean age was 15.65 years.

Initiation of WPS was measured by asking age they first “smoked three or more puffs of a water pipe.” Thirty-one percent ($n=781$) responded to the question. Age of first WPS differed significantly by ethnic identity. On average, Arab American youth first smoked at 13.4 years of age compared to 14.1 years for non-Arab American youth. From ages 10 to 13, Arab American youth reported higher rates of WPS than did non-Arab American youth; non-Arab American youth reported higher rates of first WPS between 14 and 18 years of age [Fisher exact χ^2 ($n=781$)=27.40, $P=.023$]. Youth were asked if they believed WPS was more or less harmful than smoking cigarettes. Overall, 22.1% of youth believed WPS was less harmful than cigarettes. There was a difference in belief due to ethnicity; Arab American youth believed WPS was more

harmful than cigarettes and non-Arab American youth believed WPS was as harmful as cigarettes [χ^2 (2, $n=2116$)=96.72, $P<.01$].

The Appeal of WPS

WPS is no longer a cultural phenomenon among people of the Middle East, India, Pakistan, and Africa. Its use is mainstream on college campuses across America and is increasingly used by high school and middle school youth. For youth, an additional appeal is that they do not smell like tobacco smoke but instead smell like the flavored additives, which are less discernable by parents and teachers. In addition, WPS is considered less irritating than cigarette smoking. WPS, perceived as a novel form of use, is considered relaxing and described as being cool, sexy, and seductive. Hookah bars and cafes, which are increasing throughout the United States, provide an environment for group WPS and socialization for youth. WPS is viewed as a social activity, an avenue for conversation, an alternative to drinking, and a way of passing time.⁴⁷ Smaller water pipes are increasingly available, and individual use is a growing phenomenon.

With WPS becoming increasingly popular among youth and the continued immigration of people from countries where WPS rates are high, healthcare providers and practitioners can no longer ignore the obvious popularity, growing use, and the potential harmful effects of WPS. Most healthcare professionals are unfamiliar with the practice and reported health consequences of WPS. This growing trend in tobacco use presents a new challenge for healthcare providers and practitioners when interacting and assessing tobacco use practices.

TOBACCO ASSESSMENT QUESTIONS

The final objective of the workshop presented at ISHIB2007 was to identify

the importance of assessing patients' tobacco use by asking additional tobacco screening questions of all patients. As healthcare providers it is important to not only assess if your patients are smoking cigarettes, but to assess for their use of all types of tobacco. Therefore, the first baseline tobacco use assessment question should be: Have you ever used or do you currently use or smoke any form of tobacco such as cigarettes, cigars, cigarillos, pipes, any form of smokeless tobacco (eg, chew, *pan masala*, snuff), *kreteks*, *bidis*, sticks, *snus pouches*, or water pipes, also known as *hookah*, *shisha* or *argiella*? Once this baseline question is assessed, additional assessment questions should include:

1. How often do you use or smoke this form of tobacco?
2. Do you use a filtered or unfiltered tobacco product?
3. How many times per day do you smoke/use this form of tobacco?
4. If you smoke cigars, have you ever participated in *blunting* with cigars?
 - a. How often have you done this?
 - b. If so, what substance was used to replace the tobacco?
5. If you smoke the *hookah* or water pipe, how often do you smoke it?
 - a. If you smoke the water pipe more than once per day, how many sessions do you smoke?
 - b. How long is a normal smoking session?
6. If you smoke a water pipe, do you also use other forms of tobacco? If so, what?
7. Do you smoke the water pipe alone?
8. If you smoke the water pipe with others:
 - a. How many hoses are used?
 - b. Do you share mouthpieces?
 - c. How is the unit cleaned?

- d. How often are hoses cleaned or changed?
 - e. Where do you smoke the water pipe with others?
9. How many heads (*bagars*) of tobacco do you use for each smoking session?
 10. What additives do you use when you smoke the water pipe?
 - a. Such as wine or alcohol?
 - b. Have you ever added marijuana or any other illicit substances?
 - c. Do you add crushed medications and *dust* tobacco when smoking the hookah?

In conclusion, in addition to a completing a thorough assessment of your patient's tobacco use, it is equally important for healthcare clinicians to increase educational efforts to address the myths that alternative forms of tobacco use, such as cigars, water pipes and new novel forms of tobacco delivery are not a safe alternative to cigarette smoking. Educational efforts must be directed toward the individuals to not initiate tobacco use in any form and to quit using tobacco if they are. Educational efforts should also be directed toward families and communities to keep them informed of alternative forms of tobacco being used as well as the potential harmful health effects associated with their use.

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