

Water-pipe as a Risk Factor for Genital Warts? A Case Report

Faezeh Ghaemdoust¹, Azin Nahvijou², Farah Farzaneh^{3*}

ABSTRACT

142

1. School of medicine, Tehran University of Medical Sciences, Tehran, Iran.
2. Cancer Research Center of Cancer Institute, Tehran University of Medical Sciences, Tehran, Iran.
3. Preventative gynecology research center, Shahid Beheshti University of Medical Sciences, Tehran, Iran.

*Corresponding Authors:

Farah Farzaneh

Preventative gynecology research center, Shahid Beheshti University of Medical Sciences, Tehran, Iran.

Tel: (+98)2177558081

Email: farahzaneh@yahoo.com

Background: Human papillomavirus (HPV) infection is the most common sexually transmitted infection in the world. HPV infection can cause some types of cancer including female genital cancers (cervical cancer, vulvar) and male genital cancer as well as oropharyngeal cancers and genital warts. Cigarette smoking is a risk factor of cervical cancer or genital warts.

Case presentation: This case report present a young woman who developed extensive genital warts a year after starting water-pipe smoking. These genital warts healed spontaneously after cessation of water-pipe smoking.

Conclusion: The primary hypothesis that could be propounded, is that water-pipe smoke plays a role as an independent risk factor in developing genital warts, similar to cigarette smoke. In addition, water pipe smking may transmit different infections, including HPV infection through sharing the mouth tips of the water pipe between the users.

Keywords: Waterpipe tobacco smoking, Genital pipes, HPV, Hooka, Nargileh



2019; 11(3):142-146

www.bccrjournal.com



INTRODUCTION:

Genital warts are skin or mucosal lesions that are caused by human papillomavirus (HPV) types 6 and 11. These lesions are mainly located at sites exposed to epithelial contact during sexual intercourse, such as external and internal genital sites, like the vagina and cervix in women, and the anus in both sexes. Genital warts can be asymptomatic, although they may cause problems such as discomfort, burning, itching, bleeding and also painful sexual intercourse^{1, 2}.

HPV infection is the most common sexually transmitted infection worldwide³. HPVs are double-stranded, non-enveloped DNA viruses that have epitheliotropic features, which means they only attack the stratified epithelia of the anogenital tract, skin, and oral cavity. Among more than 100 different types of HPV, about 40 types cause anogenital infections and are categorized as High and Low-risk HPVs regarding their ability to cause anogenital cancers or warts⁴. The prevalence of HPV infection is about 11–12% worldwide and is more common in young women. The most prevalent high-risk types of HPV worldwide are HPV16, 18, 52, 31 and 58³. The most prevalent low-risk types of anogenital HPV are HPV6 and HPV11. In Iran, the prevalence of HPV6 in normal cytology is about 0.5%⁵. Also, the prevalence of HPV6 and HPV11 in cervical cancer are 1 % and 2 %, respectively⁵. These low-risk types are the leading cause of more than 90 % of genital warts⁶. Almost all types of HPV infections can cause warts. Among these warts, genital warts are considered one of the most common causes of sexually transmitted diseases (STD). As mentioned, HPV6 and HPV11 are responsible for more than 90% of all genital warts. It has not yet been proven whether genital warts may lead to the development of cancerous lesions. However, some genital warts may be cured without the need for any

medical intervention⁷.

Risk factors for HPV infection in women include: 1) personal factors such as age, education, hygiene status and also immune system condition⁸⁻¹⁰. 2) factors related to sexual behaviors, such as the number of sexual partners in a lifetime for females and their male partners, age at first sexual intercourse, husband's sexual habits including extramarital sex/ intercourse with sex workers, number of live births, and etc⁴. 3) other risk factors including long-term oral contraceptive use, history of using condoms or IUD as protective factors, ethnicity, history of some infections such as chlamydia infections, smoking and chewing habits^{4, 8-11}. Risk factors for genital warts are positive HPV DNA and all risk factors that increase the risk of HPV infection (as mentioned above). Although cigarette smoking is introduced as a risk factor¹², its role in this respect is still controversial; since cigarette smoking can be representative of social risk-taking behaviors that influence the prevalence of HPV within sexual networks¹³. Some researchers have reported a relation between tobacco use and high-risk behaviors, such as higher alcohol consumption and drug abuse, sexual anal intercourse and earlier onset of sexual activity^{4, 12, 13}.

Cigarette smoking has been proved to be a significant risk factor in the development of many health problems, including cardiovascular diseases, COPD, malignancies, etc¹⁴. However, the notable point is that cigarette smoking is just one form of tobacco use. Tobacco is used in various ways around the world. One of them is water-pipe tobacco smoking (WTS). WTS is a traditional and local method of tobacco consumption, especially in Middle Eastern countries which have gradually spread to other countries around the world including western societies^{14, 15}. There have been fewer studies on the effect of WTS on health compared to cigarettes¹⁶. In order to generalize the results from cigarette studies to the water-pipe, we need to briefly compare these

two methods of tobacco smoking with each other: The majority of the components in cigarette and water-pipe smoke are similar; however, some toxic materials are more concentrated in water-pipe tobacco smoke¹⁷. The aim of this case report is to emphasize the harmful effects of WTS and how its cessation can reverse some of these undesirable effects. This patient is a good example of WTS complications.

CASE PRESENTATION:

A 21-year old woman from Tehran referred to a private clinic. She had been married for one year and was nulligravida and used condoms as a contraceptive method. She did not state any past medical history of systemic or sexually-transmitted diseases. Her husband was a 22-year old healthy man. He also did not have any past medical history of systemic or sexually-transmitted diseases. Neither the patient nor her husband were smokers. Upon physical examination, extensive lesions were observed on the vulva, extending from the mons pubis to the anus. A Pap smear test was done for the patient. However, high-risk HPV-DNA typing was not carried out due to the patient's age. In STD workup, HIV and Pap were negative.

After obtaining a complete patient history, it turned out that she attended family reunions, held by her husband's family, in which it was customary for relatives to gather together and smoke water-pipe. The patient stated that she had regularly participated in these gatherings since her marriage during the previous year.

We advised the patient to receive laser therapy. We also suggested a biopsy due to the extent of the lesions, some of which were larger than one centimeter. We also explained to the patient that tobacco smoking could raise the resistance of high-risk and low-risk HPV to treatment and that it would be beneficial for her to quit water-pipe smoking.

Although the patient decided not to receive any treatments, she came back a year later. The lesions had com-

pletely disappeared with no scars or trace of warts. The patient mentioned that she had simply abandoned the family reunions and water-pipe smoking.

DISCUSSION:

Tobacco consumption plays a vital role in the development of non-communicable diseases, including cancers¹⁴. In Iran, different patterns of cigarette and water-pipe smoking are seen in different parts of the country. Cigarette smoking is more prevalent in the northwestern and central parts, whereas water-pipe smoking has a higher prevalence in the south and southeastern parts of the country¹⁶.

WTS sessions expose the person to larger smoke volume and more tobacco toxicants in comparison with one smoked cigarette. Water-pipe smoke contains many of the toxicants present in cigarette smoke, including nicotine, tar, carbon monoxide, polycyclic aromatic hydrocarbons, volatile aldehydes, phenols and heavy metals¹⁸. The World Health Organization declares that the smoke inhaled by a single WTS session is about 100-200 times greater than that consumed by smoking a single cigarette¹⁹. One study demonstrated that the blood nicotine level in a person after one WTS session was equal to a person who smokes ten Cigarettes per day²⁰. Compared to the cigarette, a single WTS session is associated with 1.7 folds nicotine, 8.4 folds carbon monoxide and 36 folds tar exposure for the smoker¹⁷. Many studies state that there are numerous carcinogens in water-pipe smoke, such as polycyclic aromatic hydrocarbons (PAH), naphthylamines, tobacco-specific nitrosamines, primary aromatic amines, carbon monoxide, carbonyls like formaldehyde, acetaldehyde or acrolein and so on. It was also revealed that the level of these toxic and carcinogenic materials are much higher in water-pipe smoke than cigarette smoke^{15, 17}.

While taking into account the fact that the water-pipe has more concentrated toxicants than the cigarette, we can compare and generalize the results of cigarette

studies to water-pipe smoking.

Kapeu et al. confirmed that smoking could increase the risk of invasive cervical cancer about 2-fold, independent of HPV infection²¹. This fact can show us the effect of cigarette toxicants, and it can bring up a hypothesis: similar to that existing for the cigarette, namely that WTS can also be capable of affecting the genital epithelium and could be an independent risk factor for cervical cancer.

Although cigarette smoking can be associated with other risk-taking behaviors such as risky sex and alcohol consumption, there are longitudinal studies and systematic reviews declaring that cigarette smoking is not only a risk factor for cervical cancer but can also be a risk factor for the development of genital warts^{22, 23}. There is also evidence supporting the fact that smoking cessation can lead to a reduction in the size of low-grade cervical cancer lesions²⁴.

Since the constituting materials of cigarette and water-pipe are similar, it comes to mind that water-pipe can also be a risk factor for anogenital warts. Another important point must be mentioned: since the public is well-informed about how harmful cigarette smoking can be, a lot of young adults smoke water-pipes instead of cigarettes; this is because there is an incorrect belief that WTS is less dangerous than regular cigarette smoking. These findings are supported by various studies in the United States, Iran and other countries²⁵⁻²⁸.

Conclusion: In this case report, we presented a woman who had extensive genital warts. These warts appeared after she began smoking water-pipe. The lesions disappeared after quitting without the need for any interventional treatment. This occurrence can be the start of a hypothesis that water-pipe smoke can be an independent risk factor for the development of genital warts. Future trials might prove this hypothesis. Significant efforts are required to inform the public about the harmful effects of water-pipe tobacco smoking and how this method of tobacco consumption can be even more

harmful than cigarette smoking. That is why changing this false belief among young adults is necessary.

REFERENCES:

1. Insinga RP, Dasbach EJ, Myers ER. The health and economic burden of genital warts in a set of private health plans in the United States. *Clinical infectious diseases* : an official publication of the Infectious Diseases Society of America. 2003;36(11):1397-403.
2. Tchernev G. Sexually transmitted papillomavirus infections: epidemiology pathogenesis, clinic, morphology, important differential diagnostic aspects, current diagnostic and treatment options. *Anais brasileiros de dermatologia*. 2009;84(4):377-89.
3. Forman D, de Martel C, Lacey CJ, Soerjomataram I, Lorret-Tieulent J, Bruni L, et al. Global burden of human papillomavirus and related diseases. *Vaccine*. 2012;30 Suppl 5:F12-23.
4. Chelimo C, Woulides TA, Cameron LD, Elwood JM. Risk factors for and prevention of human papillomaviruses (HPV), genital warts and cervical cancer. *The Journal of infection*. 2013;66(3):207-17.
5. Bruni L AG, Serrano B, Mena M, Gómez D, Muñoz J, Bosch FX, de Sanjosé S. ICO/IARC Information Centre on HPV and Cancer (HPV Information Centre). Human Papillomavirus and Related Diseases in Iran. 2018 10 December 2018. Report No.
6. Steben M, Garland SM. Genital warts. *Best practice & research Clinical obstetrics & gynaecology*. 2014;28(7):1063-73.
7. Das R, Mishra V, Sharma N, Khurana N. HUMAN PAPILLOMAVIRUS AND ITS NATURE OF INFECTION: AN OVERVIEW. 2018. 2018:5.
8. Franceschi S, Rajkumar T, Vaccarella S, Gajalakshmi V, Sharmila A, Snijders PJ, et al. Human papillomavirus and risk factors for cervical cancer in Chennai, India: a case-control study. *International journal of cancer Journal international du cancer*. 2003;107(1):127-33.
9. Shields TS, Brinton LA, Burk RD, Wang SS, Weinstein SJ, Ziegler RG, et al. A case-control study of risk factors for invasive cervical cancer among U.S. women exposed to oncogenic types of human papillomavirus. *Cancer epidemiology, biomarkers & prevention : a publication of the American Association for Cancer Research, cosponsored by the American Society of Preventive Oncology*. 2004;13(10):1574-82.
10. Rodriguez O, Kovarik CL. Immunostaining for High-Risk Human Papillomavirus in Condyloma Lesions in Immunocompromised Patients. *American journal of clinical dermatology*. 2017;18(3):413-7.
11. Vinodhini K, Shanmughapriya S, Das BC, Natarajaseenivasan K. Prevalence and risk factors of HPV infection among women from various provinces of the world. *Arch Gynecol Obstet*. 2012;285(3):771-7.

12. Wiley DJ, Elashoff D, Masongsong EV, Harper DM, Gylys KH, Silverberg MJ, et al. Smoking enhances risk for new external genital warts in men. *Int J Environ Res Public Health*. 2009;6(3):1215-34.
13. Duval X, Baron G, Garelik D, Villes V, Dupre T, Leport C, et al. Living with HIV, antiretroviral treatment experience and tobacco smoking: results from a multisite cross-sectional study. *Antiviral therapy*. 2008;13(3):389-97.
14. Drope J. *Tobacco Atlas: American Cancer Society, Incorporated*; 2018.
15. Maziak W. The waterpipe: an emerging global risk for cancer. *Cancer epidemiology*. 2013;37(1):1-4.
16. Nemati S, Rafei A, Freedman ND, Fotouhi A, Asgary F, Zendejdel K. Cigarette and Water-Pipe Use in Iran: Geographical Distribution and Time Trends among the Adult Population; A Pooled Analysis of National STEPS Surveys, 2006-2009. *Arch Iran Med*. 2017;20(5):295-301.
17. Cobb C, Ward KD, Maziak W, Shihadeh AL, Eissenberg T. Waterpipe tobacco smoking: an emerging health crisis in the United States. *American journal of health behavior*. 2010;34(3):275-85.
18. Primack BA, Carroll MV, Weiss PM, Shihadeh AL, Shensa A, Farley ST, et al. Systematic review and meta-analysis of inhaled toxicants from waterpipe and cigarette smoking. *Public Health Rep*. 2016;131(1):76-85.
19. TobReg Advisory Note: Waterpipe Tobacco Smoking: Health Effects, Research Needs and Recommended Actions by Regulators, (2018).
20. Shafagoj YA, Mohammed FI. Levels of maximum end-expiratory carbon monoxide and certain cardiovascular parameters following hubble-bubble smoking. *Saudi Medical Journal*. 2002;23(8):953-8.
21. Moralejo D. Smoking increased risk of cervical cancer, independent of infection with high-risk HPV types. *Commentary. Evidence-based nursing*. 2009;12(4):122-.
22. Hansen BT, Hagerup-Jenssen M, Kjaer SK, Munk C, Trygstadottir L, Sparen P, et al. Association between smoking and genital warts: longitudinal analysis. *Sex Transm Infect*. 2010;86(4):258-62.
23. Kaderli R, Schnuriger B, Brugger LE. The impact of smoking on HPV infection and the development of anogenital warts. *International journal of colorectal disease*. 2014;29(8):899-908.
24. Szarewski A, Jarvis MJ, Sasieni P, Anderson M, Edwards R, Steele SJ, et al. Effect of smoking cessation on cervical lesion size. *Lancet*. 1996;347(9006):941-3.
25. Smith SY, Curbow B, Stillman FA. Harm perception of nicotine products in college freshmen. *Nicotine & tobacco research : official journal of the Society for Research on Nicotine and Tobacco*. 2007;9(9):977-82.
26. Ward KD, Eissenberg T, Gray JN, Srinivas V, Wilson N, Maziak W. Characteristics of U.S. waterpipe users: a preliminary report. *Nicotine & tobacco research : official journal of the Society for Research on Nicotine and Tobacco*. 2007;9(12):1339-46.
27. Ghafouri N, Hirsch JD, Heydari G, Morello CM, Kuo GM, Singh RF. Waterpipe smoking among health sciences university students in Iran: perceptions, practices and patterns of use. *BMC research notes*. 2011;4:496.
28. Ziaei R, Mohammadi R, Dastgiri S, Viitasara E, Rahimi VA, Jeddi A, et al. The Prevalence, Attitudes, and Correlates of Waterpipe Smoking Among High School Students in Iran: a Cross-Sectional Study. *International journal of behavioral medicine*. 2016;23(6):686-96.