

Oral Habits Associated with an Increased Risk of Oral Cancer in Vietnam

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ABSTRACT

While tobacco and alcohol related oral cancer is showing a decreasing trend in most of the developed countries, this is not the case with South Asian and South-East Asian countries including Vietnam, where the incidence of oral cancer is increasing. The usage of tobacco, alcohol and betel nut products, all well established oral cancer risk factors, is prevalent in Vietnam; however, there is a lack of information in literature regarding the incidence of oral cancer in Vietnam and the associated types and forms of associated risk factors. In this paper, we provide an overview of oral cancer and precancer incidence with description of oral cancer related habits practiced in the Vietnamese population. We also describe the cultural aspects of these habits as well as the implementation of new tobacco regulations by Vietnam government.

Keywords: Alcohol, Betel nut, Prevention, Tobacco

INTRODUCTION

Oral cancer is largely considered a preventable cancer [1]. Use of tobacco in the form of smoking and chewing, excessive alcohol drinking, and betel quid/areca nut chewing are well established risk factors for oral cancer and premalignant lesion [2-4]. At least 75% of these cancers have been attributed to the use of tobacco or alcohol drinking habits and both habits have a synergic effect to oral cancer risks [5]. Although, the five year survival rate has not much improved for over five decades, the incidence of oral cancer shows slight decrease in most of the developed countries [6]. A decrease in smoking and heavy alcohol drinking has been cited as the likely reasons for this trend [6]. However, this does not hold true for all the regions, especially in South Asian and South-East Asian countries, including Vietnam, where the incidence of oral cancer remains the highest [7-9].

Vietnam, with the growing economy, has received global attention in their health related issues, including oral cancer [10]. The frequent usage of tobacco, alcohol, and betel nuts, commonly known risk factors for oral cancer, is of concern. Due to the limitation of publications in literature, there is a lack of information on the incidence of oral cancer and premalignant lesion in Vietnam and the associated risk factors. This has limited our ability to perform a systematic review.

The Faculty of Dentistry at the University of British Columbia (UBC), Vancouver, Canada, has over many years established a strong relationship with the National Hospital of Odonto-Stomatology (NHOS) in Ho Chi Minh City (HCMC), Vietnam. For over a decade, general practice resident rotations to Vietnam exposes young oral health professionals from Canada to disease patterns and its terminal effects not seen in North America. Benefits from this exchange program in education, service and research are enormous. To take this relationship a step further, an oral health research centre named 'UBC Dentistry and National Hospital of Odonto-Stomatology Oral Health Research Centre' was established in HCMC in December 2012 [11]. This centre aims to develop strategic partnerships in research and education between Faculty of Dentistry, UBC and NHOS. The intent of all the collaborative research is to improve the oral health of the Vietnamese people while the purpose of educational

partnership is to strengthen Vietnamese oral health education system. This review aims to provide an overview of oral cancer and precancer incidence with comprehensive description of oral cancer related oral habits practiced in the Vietnamese population. We hope that through the understanding of known risk factors at the local and cultural levels, various education and awareness programs can be implemented to improve oral health in this emerging economy.

Oral Cancer and Premalignant Lesion in Vietnam

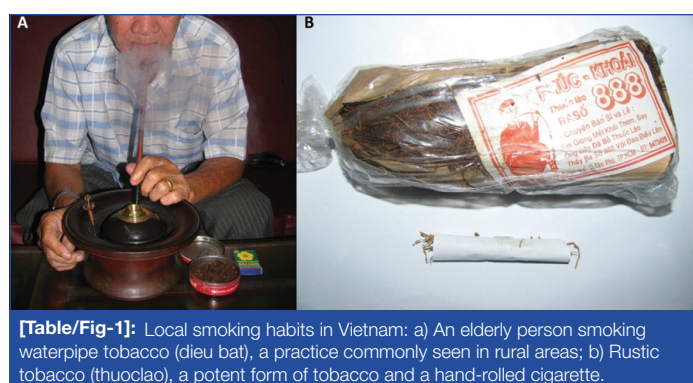
Oral cancer ranks as the seventh most common cancer in Vietnam [12]. As reported by previous studies, oral cancer in Vietnam is usually detected in advanced stages [8]. From a retrospective study of 1,084 oral cancers treated at the HCMC Oncology Hospital from 1993 to 1996, Linh TDN et al. reported that ~68% patients were diagnosed at stage III and IV [13]. In males, tongue was the most common site of oral cancer. Smoking habit and alcohol abuse were the most important risk factors among males. There was no change in the prevalence of smoking habit reported during the past 20 years with over 90% of oral cancer male patients being smokers. More worrisome was that there was a decrease of an average age of oral cancer in males from 64 years to 55 years [13]. The common sites of oral cancer in betel chewers were found to be the buccal mucosa (33%) and the labial mucosa (29%). There has been a shift of male to female ratio of oral cancer from 1:1.2 in 1995 to 1.9:1 in 2005 [14].

A community based screening program of 9,000 individuals living in Southern Vietnam in 1996-1997 showed a high prevalence (19.8%) of oral mucosal lesions. Oral cancer was detected in 0.06% individuals. Leukoplakia was the most common precancerous lesion detected with a prevalence of 3.8% [15]. In addition to smoking and alcohol consumption, betel quid has been a recognized risk factor for oral cancer. In the study of 152 betel quid chewers and 137 non-quad chewers controls, significantly higher prevalence (80%) of oral mucosal lesions in betel quid chewers was reported, in contrast to 37% observed in non-quad chewers. The observed mucosal lesions included betel quid chewer's mucosa (66%), oral submucosal fibrosis (13%), leukoplakia (4%), and lichen planus (5%) [16]. In another study, conducted by Cuc TTK et al., among betel quid chewers and non-chewers in Ba Diem community close

to Ho Chi Minh City, the prevalence of oral precancerous lesions was much higher in chewers (21.5%) as compared to non-chewers (1%) with the most prevalent lesions amongst chewers being oral submucosal fibrosis (15%), leukoplakia (4%), and lichen planus (5%) [17].

Prevalence of Smoking and Forms of Tobacco Consumption in Vietnam

Recently, World Health Organization (WHO) expressed its concerns about the increase in lifestyle related diseases in Vietnam [18]. In Vietnam, there are no age restrictions for purchasing and smoking of cigarettes. As a result, high prevalence of smoking has been reported with ~65% of men from age 25 to 45 years, one of the highest in the world [19]. Among male smokers, 69% smoked cigarettes only, 23% smoked 'waterpipe' tobacco [Table/Fig-1a] only and 7.7% reported to use both products [20]. The use of 'waterpipe' tobacco (diều bát) as well as the 'hand-rolled' cigarettes was more popular in rural areas than in urban population. The latter is a much cheaper form [Table/Fig-1b]. About 63% of households were found to have at least one smoker. Moreover, the exposure of second-hand smoking is of concern, especially for women and the youth. Women in Vietnam are found to have lower smoking rates (~2%); however, they are frequently exposed to second-hand smoking at home. Similarly, 71% of children under age 5 and 60% of school attending youth were reported to be exposed to second hand smoking at home [21]. This further supports the importance of urgent need in implementing public health policies for reducing



[Table/Fig-1]: Local smoking habits in Vietnam: a) An elderly person smoking waterpipe tobacco (diều bát), a practice commonly seen in rural areas; b) Rusc tobacco (thuoclaò), a potent form of tobacco and a hand-rolled cigarette.

smoking in Vietnam.

Although with the rise in economy, Vietnam remains a socialist political system and retains state ownership of the bulk of major enterprises, including tobacco. The production and sale of tobacco and tobacco products is a lucrative business in Vietnam [22]. There has been 42% increase in total cigarette production in Vietnam from 2000 to 2006. Compared to jurisdictions using high sales tax strategies to control tobacco, Vietnam has a significantly lower sales tax [19]. Annual cost of cigarettes in Vietnam is calculated to be around US\$ 417 million, which is equivalent to the purchase of 1.6 million tons of rice, enough to feed nearly 10.6 million persons annually [23].

In recognition of the growing threat of smoking to Vietnamese health, the Government of Vietnam launched the National Tobacco Control Policy (NTCP -12/2000/NQ-CP), 2000-2010 in August 2000 [24]. Since its launch, various tobacco control policies were implemented including bans of direct or indirect advertising of tobacco products and tobacco industry marketing activities and prohibition of domestic organizations from receiving sponsorship from tobacco companies. Along with these bans, sales tax on tobacco products was increased and health warning statements on cigarette packets were introduced (Decision 2019/2000/QĐ-BYT) [25]. In June 2012, Government of Vietnam passed a law (No. 1,315/QĐ-TTg), banning smoking in public places including schools, hospitals, office buildings and on public transportation. Ministry of Health in Vietnam drafted the law on prevention and control of tobacco harms (Law

No 09/2012/QH13) that came into effect on 1st of May, 2013. This law aims to toughen the legal aspects of tobacco control policy to ensure proper execution and implementation [26]. Hopefully, these efforts will make significant improvements in tobacco-related health conditions including oral cancers.

Prevalence and Characteristics of Alcohol Drinking in Vietnam

Limited data are available regarding alcohol consumption and alcohol related problems in Vietnam. Similar to smoking, there is no legal age restriction for alcohol drinking in Vietnam [27]. In the years between 1993 to 2000, it was reported that the total alcohol consumption per Vietnamese adult has shown an increase of approximately 2.5 times [28]. According to the Global Report on the status of health and alcohol in 2011, the total adult per capita consumption (older than 15 years old) in Vietnam in 2005 was about 3.8 liters of pure alcohol (100% alcohol), of which 2.7 liters was considered 'unregulated' types of alcohol. Unregulated alcohol relates to the type of alcohol consumption that is not reflected in official statistics.

In Vietnam, "rice wine" is the most commonly consumed traditional 'unregulated' alcoholic beverage. It is generally self-produced in home-made distilleries [Table/Fig-2a] and thus is much cheaper than imported wine. It presents almost ubiquitously- any restaurant or coffee shop- and can be bought without any restrictions to age or amount. The alcohol content of such wines can vary from 15% to up to 50% [29]. For farmers, rice wine is produced as a supplementary source of income and wine dregs can be used to feed pigs [30]. In Vietnamese language, ruou means wine. Three main types of rice wines are produced in Vietnam: the conventional distilled variety known as "ruou gao" (rice alcohol), wine brewed in large ceramic jars without distillation called "ruou can" (stem wine or tube wine), and distilled alcohol pickled with plants and animals,



[Table/Fig-2]: Types of alcohol in Vietnam: a) Local home distillery used to produce rice wine at Cu Chi district near Ho Chi Minh City; b) Ruou can or tube wine, brewed in a large ceramic or earthenware jar and consumed using long slender bamboo straws, in a local festival; c&d). Varieties of ruou thuoc or medicine wine, which are made by infusing snakes or scorpions (usually venomous) in rice wines.

known as "ruou thuoc" (medicine wine) [Table/Fig-2b-d] [31].

Lachenmeier DW et al., conducted a first of its kind study to chemically analyse the quality of four homemade and seven commercial alcohol products in Vietnam. Homemade samples had notably high amount of alcohol content, with snake/scorpion alcohol (ruou thuoc) having alarmingly high strength of 78% vol. High concentration of alcohol could be needed to preserve the animals, to neutralize the poisons, and to increase the shelf life of the product [32]. However, the alcohol strengths are not labelled on the bottles of snake/scorpion alcohols and thus, could lead to severe intoxication and overdose and can cause marked detrimental effects on health. High level of methanol and 'possibly carcinogenic' substance, like

ethyl carbamate (urethane) were also detected [33].

In addition, an increase in the cases of alcohol related disorders due to alcohol abuse, mental disorders in particular, have been reported by hospitals in Vietnam during the past decade [34]. To date, there has been no published literature regarding the consumption of unregulated alcohol as a causative agent for oral cancers in the local population.

Prevalence and Characteristics of Betel Quid Chewing in Vietnam

Betel nut has been recognized by the WHO as an independent carcinogen [35]. Betel quid consists of a betel leaf wrapped around a mixture of areca nut, slaked lime, with or without tobacco. Nitrosamines released from alkaloids in areca nut along with reactive oxygen species have proposed as causative agents for the development of oral potentially malignant disorders such as oral submucous fibrosis and oral cancer [36]. Betel quid or *trau* in Vietnamese, a preparation of nuts and lime, has a long history in Vietnamese culture. According to Vietnamese legends, chewing betel quid has been a custom since the time of Hùng Vương, ancient Vietnamese rulers, ~2879 BC [37].

In Vietnam, a dish of betel quid is commonly seen at wedding ceremonies where they are offered to invited guests and at festivities for making acquaintances [Table/Fig-3a,b]. Betel and areca nuts are also used as offerings while worshipping ancestors. Betel and areca nuts are usually dried [Table/Fig-3c], shredded into smaller pieces or powdered using a mortar and pestle, and mixed with white or pink lime, which has high pH value of up to 10 [Table/Fig-3d]. This mixture is then wrapped in a betel leaf and placed, sometimes overnight, between the cheek and tongue. After chewing the betel quid, some chewers use a piece of tobacco leaf to rub on the teeth and gingiva, and subsequently, place the tobacco at a corner of the mouth, a usual site of buccal squamous cell carcinoma [16]. Tobacco is also frequently added to the quid in the form of 'rustic' tobacco (*thuốc lào*) [15]. *Thuốc lào* is a very potent form of tobacco with nicotine content much higher than the normal tobacco. It is also used as an

years is mostly confined to elderly women [13]. The decreasing trend of betel chewing habit in population could be attributed to the changes in culture and life styles that have been witnessed lately.

Implementation of the policies to limit oral habits are impeded by the deep-rooted social and traditional/cultural practices in Vietnam, especially in its rural communities. A possible approach is to provide population-based research focusing on the effects of these habits on disease prevalence in the community to raise awareness. Through a recent support from the Terry Fox Research Institute, the Canadian Chamber of Commerce Vietnam, and the tens of thousands of participants and donors in Vietnam for the Terry Fox Run in HCMC, a project, titled 'Prevention Strategies in Early Detection and Diagnosis of Oral Cancer in Vietnam', has been developed and community oral cancer screening teams have started screening patients in the identified communities that have high risk oral habits. In near future, these collaborative efforts of the UBC, the NHOS, the University of Medicine and Pharmacy, and the Oncology Hospital in HCMC can help to identify the changes in demographics and risk factors related to oral lesions, including oral premalignant and malignant lesions, then use that knowledge to design an effective program in oral cancer screening in this diverse and geographically dispersed population.

CONCLUSION

Although the habit of betel quid chewing is declining in Vietnam, there has been a significant increase in smoking and alcohol drinking habits, particularly in youth and women, for the past few decades. Government has lately introduced strict policies to improve this situation, such as prohibiting smoking at public places, increasing the prices of tobacco products, and printing health warning labels on the cigarettes packets. More efforts are needed to effectively implement these strategies, especially in the rural and remote areas where the knowledge about the serious health consequences of smoking and alcohol consumption is largely lacking.

List of Abbreviations

- University of British Columbia- UBC
- National Hospital of Odonto-Stomatology- NHOS
- Ho Chi Minh City- HCMC
- World Health Organization- WHO
- National Tobacco Control Policy- NTCP

Ethics and Consent to Participate

The people in the figures gave verbal consent to participate. None of the images used now have recognizable complete faces presented.

Consent for Publication

The final version has been seen and approved by the authors and there is agreement to transfer all the copyrights to the journal.

ACKNOWLEDGEMENTS

Terry Fox Research Institute, the Canadian Chamber of Commerce Vietnam, and the University of British Columbia (UBC)-Oral Cancer Research Fund. All authors would like to acknowledge the contribution of Dr. P. Michele Williams for her contribution in manuscript preparation at its initial phase.

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[Table/Fig-3]: Betel quid chewing habit in Vietnam: a) Fresh areca nuts (white asterisk) and betel leaves (red arrow); b) Betel quid and cut fresh nuts served in a wedding ceremony. (Inset) Betel quid, wrapped in a form of wings of a flamboyant flower, represents charming and skillful Vietnam women; c) A package of Cau Khongluoc- dry areca nuts; d) Example of a betel quid: fresh betel leaf, (from left, clockwise) dry peels of cinammon tree, white or red lime, roots from *Artocarpus-tonkinensis*, and fresh or dry areca nut.

ingredient while smoking *diều bát* (water pipe- [Table/Fig-1b]) or *diều cây* (bamboo pipe).

Fortunately, betel quid chewing in Vietnam has been reported to be on a decline [11]. A survey of 2,179 persons in HCMC in 1993, including 1,096 females, showed that practice of this habit in recent

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Date of Submission: **Apr 04, 2017**
Date of Peer Review: **Jun 07, 2017**
Date of Acceptance: **Sep 13, 2017**
Date of Publishing: **Nov 01, 2017**

FINANCIAL OR OTHER COMPETING INTERESTS: None.