



Editorial

Emerging Trends in Nicotine Consumption[☆]

Formas emergentes en el consumo de nicotina

José Javier Lorza Blasco

Complejo Hospitalario de Navarra, Pamplona, Navarra, Spain



Humans have been inhaling substances since civilization began. The cultivation of the tobacco plant has spread from its native South America to the rest of the world, and the regular consumption of cigarettes and other forms of tobacco has become an unprecedented universal health problem. The intensely addictive nature of nicotine and the economic interests of the tobacco industry have united to perpetuate this serious, apparently unresolvable problem. The association of tobacco with various respiratory diseases is well known,¹ including chronic obstructive pulmonary disease, lung cancer, asthma, infections (pneumonia, viral infections, tuberculosis), pneumothorax, Langerhans cell histiocytosis, respiratory bronchiolitis with or without interstitial disease, desquamative interstitial pneumonia, pulmonary fibrosis, rheumatoid arthritis-associated interstitial lung disease non-specific interstitial pneumonia, acute and chronic eosinophilic pneumonia, pulmonary hemorrhage, combined pulmonary fibrosis and emphysema, asbestosis, and even vascular diseases, such as stroke or pulmonary hypertension. The possible protective effect of tobacco in the development of sarcoidosis or hypersensitivity pneumonitis is of little relevance in epidemiological terms.

In the last few years or decades, we have seen changes in the way that nicotine is consumed. Some forms have emerged de novo, hand in hand with technological advances, while others have been recovered from ancient traditions. We report here on some of the most relevant and controversial factors of these new tobacco habits.

Vaping using electronic cigarettes (e-cigarettes). Use of these devices among both adults and young people is increasing.² They include a battery and, usually, but not always, release nicotine (Electronic Nicotine Delivery Systems or Electronic Non-Nicotine Delivery Systems). They generally consist of a cartridge that contains the “e-liquid” which is heated by an element activated by inhalation to release an aerosol (vapor). We speak then of “vaping” rather than smoking, because strictly speaking, it is not smoke that is inhaled. The e-liquid of the cartridge may contain nicotine (tobacco extracts with different degrees of purity), propylene glycol, vegetable glycerin and hundreds of flavors, and other substances, generally at low concentrations. Transforming the liquid

into vapor by the action of heat breaks down some of its elements. Thus, the composition of the vapor can be very variable, as it is dependent on factors such as the initial composition of the e-liquid, the temperature, the manufacture and design of the device (metals, plastics, rubber, etc.) or the individual’s way of inhaling. The substances that enter the airway include acetaldehyde, formaldehyde, acrolein, carbonyls, and even benzenes, all known human carcinogens. Although toxic exposure with electronic cigarettes is lower than that of conventional cigarettes, the real effects of active or passive consumption on human health are yet to be demonstrated, especially in the long term, so these devices cannot be regarded as safe. With regard to respiratory health, in addition to cough and local irritation, a short-term increase in resistance and respiratory impedance were found³ with no apparent associated obstruction.⁴ Further studies are needed if this practice is to be considered a useful alternative in the reduction of toxic, clinical or epidemiological harm. Nor is there sufficient evidence to confirm the superiority of the e-cigarette as a tool for stopping smoking, compared to currently available resources. The Spanish Society of Pulmonology and Thoracic Surgery has published a document in which they air their doubts about the safety of e-cigarettes, and call for them to be regulated.⁵

Waterpipe. This system has numerous names, for example, “hookah”, “shisha”, “narghile”, or “kalian”. It works similarly to a tobacco smoking machine for food. When you inhale through a tube, a coal ember heats the mixture of tobacco, molasses and flavoring placed in a bowl at the top of the machine. The smoke passes through a stem into a container of water that acts as a seal. In the past few years, use of this ancient custom from Asia and Africa has spread all over the world among young people and adults.⁶ The inhaled aerosol contains very high levels of CO (resulting from the combustion of coal), hundreds of known toxins, and dozens of human carcinogens. Addiction to nicotine administered through a waterpipe can be very intense and is measured specifically on the validated Lebanon Waterpipe Dependence Scale-11. Acute respiratory effects of consumption include increased respiratory rate, reduction of distal flows on spirometry, peak flow reduction, and dyspnea measured on the Borg scale. The long-term effects have not been clearly established, as this is an emergent phenomenon, but an association has already been proven with polycythemia, reduced distance in the 6-minute walk test, lung cancer, and chronic obstructive pulmonary disease.^{7,8}

[☆] Please cite this article as: Lorza Blasco JJ. Formas emergentes en el consumo de nicotina. Arch Bronconeumol. 2019;55:71–72.

E-mail address: jj.lorza.blasco@navarra.es

Rolling tobacco (roll-your-own cigarettes). The number of people using tobacco in this form has multiplied exponentially in the past few years.⁹ The economic crisis may have fueled this phenomenon, since many users report that the main reason for changing from conventional cigarettes is the price. The argument that hand-rolled tobacco is less harmful, creates less addiction, or is easier to cut down or give up are simply myths that must be disproved.¹⁰

Swedish snus (Swedish-type oral moist snuff). This form of consumption is traditional in Sweden, where it is even more prevalent than conventional cigarettes. It has also been promoted in some countries including the United States,¹¹ but has been banned in Spain and other countries of the European Union. *Snus* is a tobacco product obtained by pasteurization which is placed under the upper lip, either in a little bag like a teabag, or else loose, where it releases nicotine. The major arguments in defense of *snus* include its lower overall toxic potential compared to conventional tobacco, and its probable contribution to the low prevalence of smoking in Scandinavian countries. Recommendations for its use as an epidemiological tool for harm reduction have been inhibited by the significant increase in its use, particularly among young smokers and non-smokers, the addictive and somatic effects of nicotine, the questions surrounding safety (oral and pancreatic disease, for example), and marketing concerns.

Chewing tobacco (smokeless tobacco). This is a smokeless tobacco product obtained by fermentation which is used in many regions of the world, although it is also banned in the European Union. As with *snus*, the oral route of administration significantly reduces the risk of causing respiratory illness. However, in addition to the effects of nicotine itself, its causal relationship with extrapulmonary disease, including cardiovascular disease and cancer of the head and neck,¹² make it a high-risk practice for health.

Bidi. We speak little and know less in our setting about the consumption of *bidi*. These cigarettes are widely smoked in countries such as India.¹³ They are usually rolled in a non-porous leaf and burn slowly, thus increasing pulmonary toxicity. Its composition is very variable, and the addition of flavorings and aromatic agents is uncontrolled. *Bidis* are often made by family businesses without any sort of regulation or legislation for preparation and packaging. It has been associated¹⁴ with respiratory symptoms (dyspnea, cough, expectoration, and chest pain), with spirometric changes, and even with respiratory deaths.

Smokeless cigarettes (Heat not burn). The recent introduction of this product deserves special attention. Although there are currently at least 3 types, the *I Quit Ordinary Smoking* brand is being promoted in Spain. In this case, an electronic device (different from the e-cigarette) warms the mixture of tobacco, glycerin, fibers, and guar gum to a temperature of 300–350 °C without reaching the combustion temperature of conventional cigarettes, that occurs at 800–1000 °C. In this way, the steam that supposedly contains fewer toxic substances than tobacco conventional is generated. Once again, we currently do not have reliable information to confirm the usefulness of this product in harm reduction.¹⁵

In conclusion, it is clear that the use of inhaled substances other than conventional tobacco in our setting has increased. The variability in processing or manufacture, and the emergent and changing character of the different forms of use limit understanding of the effects on respiratory health in the short, medium and long term. It is possible that some forms are less toxic than conventional tobacco, but in no case can they be considered secure, because abstinence is 100% safe. We need quality scientific and epidemiological studies to clarify if we can speak of an acceptable risk. We must also remember that the search for tools that promise harm reduction must always come in second place to policies aimed at preventing starting and helping give up any substance that is harmful to our health.

References

1. U.S. Department of Health and Human Services. The Health Consequences of Smoking—50 Years of Progress: A Report of the Surgeon General. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health; 2014.
2. Anic GM, Holder-Hayes E, Ambrose BK, Rostron BL, Coleman B, Jamal A, et al. E-cigarette and smokeless tobacco use and switching among smokers: findings from the national adult tobacco survey. *Am J Prev Med.* 2018;8:742–9.
3. Vardavas CI, Anagnostopoulos N, Kougias M, Evangelopoulou V, Connolly GN, Behrakis PK. Short-term pulmonary effects of using an electronic cigarette: impact on respiratory flow resistance, impedance, and exhaled nitric oxide. *Chest.* 2012;141:1400–6.
4. Flouris AD, Chorti MS, Poulianiti KP, Jamurtas AZ, Kostikas K, Tzatzarakis MN, et al. Acute impact of active and passive electronic cigarette smoking on serum cotinine and lung function. *Inhal Toxicol.* 2013;25:91–101.
5. Jimenez Ruiz CA, Solano Reina S, de Granda Orive JI, Signes-Costa Minaya J, de Higes Martinez E, Riesco Miranda JA, et al. Declaración oficial de la Sociedad Española de Neumología y Cirugía Torácica (SEPAR) sobre la eficacia, seguridad y regulación de los cigarrillos electrónicos. *Arch Bronconeumol.* 2014;50:362–7.
6. Shihadeh A, Schubert J, Klaiany J, El Sabban M, Luch A, Saliba NA. Toxicant content, physical properties and biological activity of waterpipe tobacco smoke and its tobacco-free alternatives. *Tob Control.* 2015;24:22–30.
7. Waked M, Khayat G, Salameh P. Chronic obstructive pulmonary disease prevalence in Lebanon: a cross-sectional descriptive study. *Clin Epidemiol.* 2011;3:315–23.
8. El-Zaatari ZM, Chami HA, Zaatari GS. Health effects associated with waterpipe smoking. *Tob Control.* 2015;24:31–43.
9. Sureda X, Fu M, Martínez-Sánchez JM, Martínez C, Ballbé M, Pérez-Ortuño R, et al. Manufactured and roll-your-own cigarettes: a changing pattern of smoking in Barcelona, Spain. *Environ Res.* 2017;155:167–74.
10. De Granda-Orive JI, Jiménez-Ruiz CA. Algunas consideraciones sobre el tabaco de liar. *Arch Bronconeumol.* 2011;47:425–6.
11. Araghi M, Galanti MR, Lundberg M, Lager A, Engström G, Alfredsson L, et al. Use of moist oral snuff (snus) and pancreatic cancer: pooled analysis of nine prospective observational studies. *Int J Cancer.* 2017;9:144.
12. Nair S, Datta S, Thiagarajan S, Chakrabarti S, Nair D, Chaturvedi P. Squamous cell carcinoma of the upper aerodigestive tract in exclusive smokers, chewers, and those with no habits. *Indian J Cancer.* 2016;53:538–41.
13. Jitender S, Sarika G, Sharma P, Mishra P. Bidi smoking: an underestimated issue of Indian society. *J Exp Ther Oncol.* 2017;12:73–81.
14. Duong M, Rangarajan S, Zhang X, Killian K, Mony P, Swaminathan S, et al. Effects of bidi smoking on all-cause mortality and cardiorespiratory outcomes in men from south Asia: an observational community-based substudy of the Prospective Urban Rural Epidemiology Study (PURE). *Lancet Glob Health.* 2017;5:56–9.
15. Auer R, Concha-Lozano N, Jacot-Sadowski I, Cornuz J, Berthet A. Heat-not-burn tobacco cigarettes: smoke by any other name. *JAMA Intern Med.* 2017;177:1050–2.