

Commentary: Smokeless tobacco: seeing the whole picture

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Background

A window of opportunity?

The tobacco industry, with chameleon like qualities, has continuously and successfully adapted to the changing policy environment. Witness, for example, how it has maintained a growth in profits in much of the developed world despite falling sales. With greater understanding of the hazards of second-hand smoke identified as long ago as the 1970s as 'the most dangerous development yet to the viability of the tobacco industry',¹ the tobacco industry now faces a further threat as one country after another introduces smoke-free legislation. Once again it is adapting, pursuing opportunities to diversify its product in ways that might avoid the negative effects of this legislation on profits. Several leading tobacco companies are test-marketing new smokeless tobacco (ST) products in a number of countries and articles are appearing in newspapers extolling the benefits of ST as an aid to quitting smoking.

In Europe, however, the industry faces a formidable obstacle. In 1992, the European Commission introduced a ban on the sale of oral tobacco products 'except those intending to be smoked or chewed'—effectively a ban on snuff (powdered tobacco) but not chewing tobacco.² The ban followed concerns about the addictive nature of nicotine, the potential carcinogenicity of oral snuff and the industry's targeting of young people with new smokeless products. Only one EU Member State, Sweden, is exempted from the rule (as is Norway, a member of the European Economic Area). Both therefore retain the right to sell 'snus', a form of moist snuff most commonly used in Sweden and often wrapped like tea bags, and held under the upper lip until the active ingredients are absorbed.

The industry now has a window of opportunity to bring about change. The European Commission is reviewing the ban and its Scientific Committee on Emerging and Newly Identified Health Risks has called for scientific evidence on the safety of ST, with June 2007 set as the deadline for submissions.³ In this context, the appearance of the accompanying article by Lee⁴ on the association between ST and circulatory disease is unlikely to be coincidental; Lee is a long-term consultant to the tobacco

industry⁵ and the industry's own documents outline how it has sought to influence science and policy in its favour.⁶

Unfortunately, Lee's article provides only one very limited insight into what is a complex and controversial debate. Pressure for the Commission to review the ban on ST has come not only from the tobacco industry, but also, and perhaps surprisingly, from some tobacco control advocates. The latter criticize the current situation in Europe in which the most harmful form of nicotine (cigarette smoking) is the least regulated and the least harmful (pharmaceutical nicotine) the most heavily regulated, and in which the least harmful form of ST, snus, is illegal while more harmful forms are not.⁷ Few would disagree with their analysis that the situation is anomalous. Many would probably also support a tobacco harm reduction strategy which aims to minimize the net damage to population health resulting from the use of tobacco products or their substitutes. More contentious, however, is the suggestion that the legalisation of snus should form part of such a strategy. However, the unique and uncontrolled experiments taking place in Sweden, where an increase in male snus use has coincided with a fall in smoking rates such that Swedish men now have the lowest smoking and smoking-related mortality rates in the world⁸ has stimulated calls for just such an approach.⁹

Discussion

Smokeless tobacco: the effects on health

Drawing conclusions about the health effects of ST is complicated by the wide range of products covered by this label and by the variety of compounds with which tobacco may be mixed, some of which themselves are harmful to health¹⁰. The forms of ST used in South Asia differ in numerous important aspects from the chewing tobaccos and snuff used in America, which in turn differ from Swedish snus. Differences include the types of tobacco used as well as the curing, manufacturing and storage methods. These differences mean that Swedish snus contains considerably lower levels of toxins, including the carcinogenic tobacco specific nitrosamines (TSNA), than the south Asian products and lower levels even than the equivalent US products.¹¹ The manufacturer of snus has also created a quality standard for its products that sets maximum limits for 'undesirable substances' and levels of TSNA have fallen in Swedish snus over recent years.^{11,12}

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It is now beyond doubt that the ST products used in South Asia increase the risk of oral cancer substantially.¹³ The International Agency for Research on Cancer (IARC) has twice reviewed evidence on the carcinogenicity of STs and concluded that the available evidence links ST to both oral and pancreatic cancer,^{14,15} but did not specifically compare Swedish snus with other forms of moist snuff. A more recent review focusing more specifically on Swedish snus concludes that it is carcinogenic but notes there is some uncertainty around its propensity to cause oral and pancreatic cancers.¹⁶

Lee, however, reminds us that a possible link with cancer is only one concern. A recent analysis of data from the 52-country INTERHEART study established that individuals who used ST, and did not smoke, had a significantly increased risk of myocardial infarction [Odds ratio (OR) 2.23, 95% Confidence interval (95% CI) 1.41–3.52].¹⁷ Once again, the impact of one form of ST could not be differentiated from another. Lee's study goes some way towards addressing this by examining the cardiovascular impacts of the narrower range of smokeless products sold in the west. As he notes, the available evidence is limited. It is also complex, with the answer depending on the question asked. One key comparison from a policy perspective is between current ST users and never users. Lee's broader analysis (including the use of 'near equivalents' such as ever ST users instead of current users and the use of non-current rather than never users in the comparison group) will therefore likely underestimate any impact on ischaemic heart disease. The most relevant figure he gives (easily overlooked in the text) shows a small, but significant increase in the risk of ischaemic heart disease/acute myocardial infarction (OR 1.15, 95% CI 1.03–1.19) in current ST users compared with never and non-current smokers. The risks of stroke (OR 1.42, 95% CI 1.29–57) and all circulatory disease events or mortality were also significantly increased (OR 1.25, 95% CI 1.13–1.37). The end points examined included both events and mortality which is interesting given that previous reviewers have suggested that snus may increase mortality from cardiovascular disease without increasing event rates, perhaps by virtue of nicotine's effect of increasing the risk of arrhythmias and infarction size, as documented in animal experiments.¹⁶

Tobacco is a complex substance. The active ingredients to which users are exposed vary greatly depending on where and how it is produced and how it is used. When smoked, it has been shown to be associated with many disorders, the mechanisms for which are only slowly being unravelled. This is equally true with ST. Thus, differences between the acute and long-term effects of ST on pulse rate and blood pressure are poorly understood. Lee outlines the differing results seen in studies examining the relationship between ST use and diabetes while a recent Swedish study reported a strong association between use of snus and metabolic syndrome.¹⁸ Research from India found that mothers who used ST had babies that were, on average, 105 g lighter than non-users, with a significant dose–response relationship,¹⁹ although an association with reduced birth weight was not found in South Africa.²⁰ Other than adverse outcomes in pregnancy,²¹ little is yet known of the health impacts of snus in women.

Thus, while the negative health impacts of ST, and snus in particular, are clearly far less than smoking tobacco, the picture remains far from completely understood, with the authors of two recent systematic reviews, one on ST and the other on snus, noting that the existing research suffers from inadequately powered studies, weak adjustment for confounding and the funding of much of the available research by the tobacco industry. Authors of both reviews conclude that rigorous studies with adequate sample size are still needed.^{21, 22} Some will, therefore, feel it is premature to introduce a substance into the market when there are so many questions about its safety still to be answered.

It has, however, been argued that, given that the evidence of harm is clearly far less than with smoking, the benefits of ST as an aid to stopping smoking or as an alternative to smoking outweigh concerns about any deleterious effects on health. What is the evidence?

An aid to quitting?

Snus has been used for many decades in Sweden. Once the preferred tobacco product among working class men, its use declined during the 20th century as cigarettes were popularized. However, from the early 1970s, following intense marketing to young men and athletes, sales increased.²³ It has been suggested that the availability of snus has contributed materially to the low rates of male smoking in Sweden.^{7,11} The majority of data cited in support of this argument are cross sectional in nature. One of the few studies to scrutinize these data in more detail, using birth cohort analysis, shows that those taking up snus (young men) were not those quitting (older men), suggesting that cross-sectional analyses may be misleading.²⁴ Some cross-sectional²³ and cohort studies²⁵ do suggest that snus helps smokers quit, although some are small studies with limited analyses.^{8,24} Moreover, most people quit without using snus and it is clear that other factors in Sweden, including effective tobacco control policies, have also played a key role in determining current smoking patterns.^{23,24}

Gateway effect or deterrent to smoking?

A further area of interest is whether snus acts as a gateway or deterrent to taking up smoking. Although there is some evidence from the USA²⁶ and Sweden²⁷ that adolescents using ST progress to cigarettes, the use of both products may simply be markers for risk-taking behaviours generally;¹¹ most Swedish studies and data suggest there is no gateway effect.²⁵ Moreover, if snus use did lead to smoking then rates of smoking among young Swedish men would be increasing; they are not.¹¹ Another possibility is that ST offers an alternative to adolescents that would otherwise take up smoking. Yet, here too the evidence remains uncertain.

Other concerns

There are concerns that go beyond the direct health effects of snus. Snus is addictive; could its introduction create a new epidemic? Would public health messages about the harm associated with tobacco use become confused, as the

tobacco industry would no doubt hope (the 'lights' debacle should serve as a warning)? Would legalizing snus reduce the incentive to develop new and more effective pharmaceutical or 'clean' nicotine products? Is it ethical to introduce a potentially harmful product when an unambiguously safe alternative, nicotine replacement therapy (NRT), demonstrated to be effective as an aid to smoking cessation,²⁸ already exists? Or is it unethical not to give smokers who have failed to quit using NRT an alternative? Is the Swedish experience generalizable or culturally specific? Whilst there is a clear need for evidence-based nicotine and tobacco product regulation, and while harm reduction has obvious potential to reduce the burden of tobacco-related disease, these and other issues must first be debated and, ideally, resolved. Meanwhile, it is essential to understand the intentions of the tobacco industry, so often one step ahead in any debate.

The tobacco industry

Why is there so much apparent enthusiasm for a change in the EU's policy? It is difficult to ignore the fact that the sums of money at stake are considerable. The enlarged EU now has a population that is 55% greater than that of the US. This is a huge and so far almost entirely untapped potential market. In 2001, in the US, the leading five manufacturers of ST received \$2.13 billion in receipts from wholesalers and retailers, explaining their willingness to spend \$236 million on promoting ST.²⁹ Indeed, they were even willing to spend almost \$18 million in giving their products away for free. Of course, when you are selling an addictive substance, such a strategy makes perfect sense, something long understood by the pushers of narcotics who hang around outside schools.

However, this may only be part of the reason why manufacturers, and especially those companies such as British American Tobacco and Philip Morris that are recent entrants into this market, are pushing for change. Restrictions on smoking in public places provide strong encouragement for smokers to quit, offering them an opportunity to overcome their addiction to nicotine. ST offers a perfect means of keeping them hooked, something that NRT, with its lower levels of nicotine, would not do.³⁰ Indeed, the introduction of these restrictions in many countries creates an entirely new situation, and one in which the role of snus may be quite different from what it has been in the past.

When vested interests on this scale are involved, readers are entitled to ask 'why this paper, and why now?' Each will have to make up their own mind but when doing so they are unlikely to be oblivious to the fact that the work reported by Lee, focusing on only one of the potential health effects of ST, was funded by two of the companies with most to gain from any change in the European Commission's position.

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