

Can Smokeless Tobacco Rid Us of Tobacco Smoke?

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We have been asked to put the somewhat controversial ideas of the study by Tilashalski et al (1) about smokeless tobacco into a positive perspective. To avoid possible misunderstanding, it should be mentioned that none of the authors are or have been users of smokeless tobacco. Nowhere is use of smokeless tobacco more prevalent than in our home country, Sweden. Seventeen percent of the male population 16 to 79 years of age indulge daily in oral use of the Swedish variety of smokeless tobacco, ie, moist nonfermented grained tobacco (*snus*). This prevalence is just a little lower than for daily smoking among men, 20%. Among male physicians, smokeless tobacco use is more common than smoking: 9% are daily users of smokeless tobacco compared with 5% who are daily smokers (2). The Swedish variety of smokeless tobacco is generally forbidden in the European Union, so the Swedish government had to intervene for it to be allowed when Sweden joined the Union (3).

Tilashalski et al discuss the use of smokeless tobacco as an aid to smoking cessation. The feasibility of this option will depend on the answers to at least four questions:

1. Is smokeless tobacco use acceptable to a considerable number of smokers?
2. Can smokeless tobacco use increase smoking cessation rates?
3. Are the health risks of smokeless tobacco use substantially lower than those of smoking?
4. Is there a risk that health benefits from smoking cessation by smokeless tobacco use are offset by increased tobacco use among otherwise tobacco-free individuals?

Experiences from Sweden can address, at least in part, each of these questions.

USER ACCEPTABILITY OF SMOKELESS TOBACCO

The first condition for feasibility of a cessation aid is that the product in question is acceptable to many potential users. Historically, before cigarettes were widespread, smokeless tobacco was the predominant form of tobacco

use in many countries. Recent experience suggests that smokeless tobacco is quite acceptable among Swedish men. Among Swedish females, however, few use smokeless tobacco, and those who do are young. It is possible that women would view smokeless tobacco differently, if it was presented as an aid for smoking cessation, as found in the study by Tilashalski et al.

POWER OF SMOKELESS TOBACCO AS A CESSATION AID

Smokeless tobacco could work in a similar fashion to other nicotine replacement therapies since it delivers nicotine even more efficiently than the patches or gum (4). The study by Tilashalski et al gives support to such an assumption although it cannot serve as a basis for any solid conclusions because of its small size and methodological shortcomings. Swedish males, on the other hand, serve in some way as a large long-term study population for investigating these matters: The pertinent observation is that among those who have ever been daily smokers, 66% have quit smoking in the subgroup *with* a history of smokeless tobacco use but only 45% in the subgroup *without* a history of smokeless tobacco use (unpublished data from the Institute for Tobacco Studies). This difference of 21 percentage points (95% CI 12 to 30; $P < 0.001$) suggests that smokeless tobacco use has a power to increase quit rates without being part of a formal cessation program.

Swedish *snus* has particularly enabled higher-dependency smokers to quit smoking. Among low-dependency smokers, quit rates do not differ between users and non-users of smokeless tobacco, but with increasing dependence quit rates go down a lot among those without a history of smokeless tobacco use (Figure). The mean dependence score on the Fagerström Test for Nicotine Dependence among ex-smokers without smokeless tobacco use was 2.8 versus 3.4 among those who had used smokeless tobacco. This difference of 0.62 score points (95% CI 0.09 to 1.15; $P < 0.03$) suggests that smokeless tobacco use has been specifically helpful to highly dependent smokers. The more regulated and most likely safer nicotine replacement medications may not be as effective among the highest dependency smokers because of the slower absorption and lower dose of nicotine they provide (5).

A striking feature of the Tilashalski study is the high dependence of the participants, approximately 6.8 on the somewhat different Fagerström Tolerance Questionnaire scale, on which the average of US smokers would be ap-

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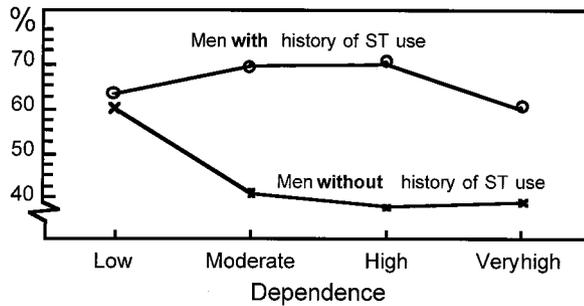


Figure. Quit rates (ex-smokers as percent of ever daily smokers) by degree of nicotine dependence. Swedish men with or without history of ST use.

proximately 5 points. In this highly dependent group there was a good outcome: 35% not smoking at 1 year (6) (25% using smokeless tobacco and the other 10% without smokeless tobacco use).

HEALTH RISKS OF SMOKELESS TOBACCO USE VERSUS SMOKING

Even if smokeless tobacco use were proven to be an efficient means of stopping smoking, it would not be acceptable unless it was certain that smokeless tobacco use is substantially less harmful to health than smoking. In 1996 a commission under the National Board of Health and Welfare in Sweden concluded, with the help of a broad range of scientific evidence including two new well-controlled studies (7,8) that Swedish *snus* did not seem to increase the incidence of upper airway cancer. Furthermore, from an international perspective, Swedish males have low rates of oral cancer despite their high level of smokeless tobacco use. Since Swedish smokeless tobacco use is a very specifically male practice, a smokeless tobacco-related increase in the risk for oral cancer would be expected to make the male/female incidence ratio higher in Sweden than in other countries. However, the opposite is true. The 1990 incidence figures for cancer of lip and oral cavity (age standardized to world population) published by the national cancer registries in the neighboring Nordic countries give the following male/female ratios: Sweden 2.0, Denmark 2.7, Finland 2.6, and Norway 2.5 (9).

The role of smokeless tobacco in cardiovascular disease is somewhat less certain. Two studies on hemodynamic/atherogenic risk factors found no effect of smokeless tobacco use (10,11). Two studies on cardiovascular mortality are less consistent, one study showing no risk increase (12) and another showing an increased risk for smokeless tobacco users although smaller than for smokers (13).

The Swedish National Board of Health and Welfare concluded in its report that "the health risks related to

smokeless tobacco are with great probability lower than those related to smoking" (14). This conservative statement appears to be supported by the observation that smoking-related mortality among Swedish men is extremely low in an international comparison. The proportion of smoking-related deaths among Swedish men is just 11%, which is the lowest proportion noted for any Western country (15) and would not be expected if smokeless tobacco use had health effects as deleterious as those of smoking.

SMOKELESS TOBACCO: GATEWAY TO SMOKING OR VACCINATION AGAINST SMOKING?

Smokeless tobacco may be more controversial in the US than in Sweden, partly because of the way it has been marketed but also because of the higher concentrations of nitrosamines in US smokeless tobacco (16). Even in Sweden, however, one of the main questions is whether smokeless tobacco may serve as a gateway to smoking.

Swedish survey studies have found that more users go from smoking to smokeless tobacco than from smokeless tobacco to smoking so that smokeless tobacco use would generally influence smoking rates in a downward direction (17). Further, in Sweden the prevalence of smoking daily or almost daily is lower among boys than among girls at the age of 16 years. From an international perspective, this rather unique situation might be seen as a consequence of some boys choosing smokeless tobacco instead of cigarettes. In the last 10 years' annual surveys this boys/girls difference has varied between 2 and 8 percentage points (18). This difference at the age of 16 does not disappear over the next few years as would be expected if smokeless tobacco at the age of 16 was a gateway to cigarette smoking. However, Swedish experiences may not be valid for the United States and other countries.

SHORTCOMINGS OF THE TILASHALSKI STUDY

The quality and internal validity of the Tilashalski pilot study are not very high. However, even in a pilot study with a limited number of subjects, the Methods section lacks important information. Why did the subjects have to be recruited over a period as long as 6 months? Is the acceptance of this treatment low? Were the subjects consecutively recruited or selected? Did the subjects know in advance of the carbon monoxide check at 12 months? What were the causes of the two deaths? It would have been informative to know when quitting occurred, to have measurements of nicotine and cotinine to know the amount of smokeless tobacco used, to know what 2.3

cans per week may mean in terms of nicotine intake, and to know if abstinence from smokeless tobacco also was encouraged. However, the major shortcoming is the lack of a control group.

CONCLUSIONS

In summary, despite the limitations of this study, we would like to encourage further research with smokeless tobacco because Swedish epidemiological data show that it may be used in a risk reduction approach, and United Nations Focal Point on Tobacco on Health has released a report (19) from a meeting of experts who recommended the use of alternative and safer forms of nicotine to reduce smoking. Such studies should recognize that smokeless tobacco may work well and better than current nicotine replacement medications for highly dependent smokers who are at greatest risk for developing tobacco related diseases (20) and that, by working with relatively minimal intervention, it may be cost effective.

The caveat with these recommendations is that one must be ready to trade a diminished risk for death and disease for continued dependence on nicotine. Such a tradeoff should not be accepted in cases where elimination of nicotine is possible, but we should accept it in people who cannot or do not want to live without nicotine. Since smokeless tobacco is not entirely free from health risks, we would advise that development of more acceptable, stronger, and widely available nicotine replacement medicines could be an even better alternative for those with strong nicotine dependence.

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