

Carbon monoxide in the expired air of smokers who smoke so-called "light" brands of cigarettes

EDITOR.—Tobacco smoke is an important source of carbon monoxide (CO). Smokers with expired CO values of 11–21 parts per million (ppm) are defined as mild smokers, whereas those with expired CO values of more than 21 ppm are defined as heavy smokers.¹ We report on the expired CO readings of smokers who smoke "light" brands compared to those who smoke regular brands. The approach chosen was designed to reflect real smoking habits, and was not laboratory based. Many health agencies measure tar and CO values using smoking machines under standardised laboratory conditions.² However, cigarettes are not smoked by machines, and smokers may titrate their nicotine intake by varying their smoke inhalation and cigarette consumption.^{3,4} Here we show that there is no difference in CO concentrations in the expired air of smokers who smoke "light" brands versus smokers who smoke regular brands.

The study assessed 178 smokers (83 males, 95 females; mean age 49.05 years), whose cigarette consumption was diagnosed according to the Vienna Standard Protocol.⁵ (This protocol includes the measurement of CO in expired air). The sample consisted of first visit clients attending publicised information meetings held by the Nicotine Institute, Vienna during a three week sampling period. The smokers were divided into two groups: those who smoked a brand of cigarette with the word "light" indicated on the packaging ($n = 63$), and those who smoked a brand that did not carry this message ($n = 115$). This information was gained by asking smokers whether they smoked "light" cigarettes, and by checking their cigarette packs. There was no difference in sex distribution between the two groups. Tobacco dependence was measured by the Fagerström test for nicotine dependence (FTND).⁶ The two groups ("light" and regular smokers) did not differ in this respect. Expired CO measurements were obtained with the Bedfont EC-50-Micro Carbon Monoxide Monitor. The smokers were not informed of the test before the measurement, which was performed at 5 pm. None of the smokers refused this measurement, and none were excluded from the analysis. None of them had changed their cigarette brand during the previous three months.

Analysis of the data focused on the relation between the "light" claim and the expired CO measurement, intentionally not taking into account the (relatively unreliable) information on cigarette consumption reported by the smokers. Reported cigarette consumption is not very reliable compared to objective measurements of CO concentrations, because these concentrations depend on the puff rate and inhalation habits of the individual. No significant difference ($p > 0.55$) was found in the distribution of CO readings of the "light" cigarette smokers compared to regular cigarette smokers (fig 1). The mean CO value achieved by the regular cigarette smokers was 27.85 ppm (SD 12.34, SE 1.15), and the mean value of the "light" cigarette smokers was 29.63 ppm (SD 10.90, SE 1.37). These results support the findings of other studies that questioned the possible advantage of cigarette brands claiming to be "light".^{7,8}

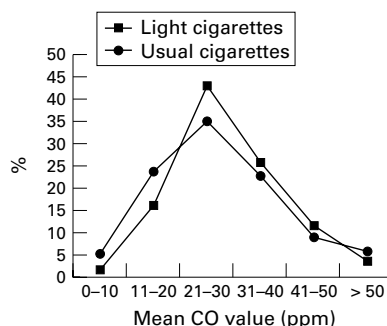


Figure 1 Distribution of carbon monoxide (CO) readings of "light" cigarette smokers and regular cigarette smokers.

The method used in this study was very much related to the situation in real life, where consumers might be attracted by "light" cigarettes because they assume these will reduce their health risk.⁹ Other variables may affect the present results, but it is likely that further studies will confirm the present assumption that tobacco consumers are misled by the information on the packages. If expired CO values are indicative of the intake of harmful substances, this might indicate some limitations in the CO haemoglobin saturation curve. (From the machine measurement of these values there is a correlation between tar and expired CO—letter from laboratory government chemist, London). Different tobacco markets may also differ in the labelling of cigarette brands, but as the smokers in this study were all exposed to the same information about cigarettes (in Austria), these findings are at least reliable for this market. These results support the suggestion that smokers titrate their nicotine intake by varying their inhalation habits.

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BOOKS

Book reviews and books of interest to "Tobacco Control" should be sent to the editor at the address given on the inside front cover.

Tobacco war

Tobacco war: inside the California battles. Stanton A Glantz, Edith D Balbach. Berkeley, California, University of California Press, 2000. ISBN 0-520-22285-7. 469 pages.

For a decade, since voters there approved a referendum question raising the state's cigarette excise tax and assigning a portion of the revenue to a campaign to reduce tobacco use, California has been a cockpit of conflict between public health forces and the tobacco industry. For most of that time, Stanton Glantz, Professor of Medicine at the University of California, San Francisco, has been an important figure in the struggle. This is his history of it, written with Edith Balbach, Director of the Community Health Program at Tufts University in Boston.

For readers of this journal, *Tobacco war* is most useful not for its accounts of tobacco industry perfidy, but for describing the evolution of tactics used by health advocates to counter the industry's political strategy. In California, the war has been fought at the local and state levels, and in the electoral, legislative, and administrative arenas.

The authors' main theme is that tobacco control advocates most effectively influence public policy by mobilising public opinion, rather than employing traditional lobbying techniques. Glantz and Balbach repeatedly demonstrate that the conventional insider tactics of influence, persuasion, and compromise result in setbacks for tobacco control, while an aggressive public posture that confronts not only the tobacco industry but also its political allies leads to victory.

Their argument is that public health agencies, which do not make political campaign contributions or employ influential lobbyists,

