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Smoking and Pregnancy

Almost 20 years have passed since the publication of the first epidemiologic reports that implicated cigarette smoking as an etiologic factor in lung cancer and other diseases. During these years cigarette smoking by men has declined appreciably, proportionately less so in women. According to current estimates, almost one third of the adult women in this country smoke cigarettes*.

For obvious reasons early studies were largely based on the smoking experience of men. For this sex the association of multiple disease states with cigarette smoking is now well documented. More recently it has become clear that women, as well as men, expose themselves to increased risk of disease and death by smoking. Diffuse pulmonary fibrosis in women has been shown by X ray (1), lung cancer rates in women are going up rapidly (2), and there is evidence of an increase in sudden death among young women (3). All these changes seem to be associated with smoking.

For women smokers in their childbearing years, there is concern about the offspring as well as the smokers themselves. Numerous studies have shown that the babies of smokers are smaller at birth than those of nonsmokers. But there has been controversy over the occurrence of effects on the offspring other than mere lowering of birth weight. Some studies have shown such effects, others have not. To evaluate the conflicting evidence, Rush and Kass (4) recently reviewed the English language literature on this subject. Their summation of reports, based on over 12 000 perinatal deaths and abortions, yielded an excess perinatal loss of 34.4% in babies of smokers.

This evidence of increased risk to infants of smoking mothers has now been further expanded by a prospective survey of almost 7000 women who received obstetrical care in 13 Paris hospitals between 1963 and 1969 (5). As expected, this study too found that the babies of smokers were lower in birth weight than those of nonsmokers. In addition, however, the smokers had a stillbirth rate more than three times as high (28 versus 8 per 1000 births); the neonatal death rates were almost the same for smokers and nonsmokers. Interestingly, a gradient in stillbirth rate among smokers was related to inhaling smoke rather than to the number of cigarettes smoked.

Although the literature on smoking and perinatal loss may seem confusing and contradictory, an overall pattern of increased fetal loss that is related to smoking has emerged. It is not surprising that not all studies have shown this relationship. Differences in rates of loss between nonsmokers and smokers appear to be greater in the prenatal than the postnatal period. Yerushalmy's figures (6) are based on neonatal mortality only. Further, many forces affect perinatal mortality. Among them are ethnicity and social class, age, parity, and prior fetal loss of the mother, multiple versus single birth, and the sex of the infant. One would not expect to find marked differences in perinatal mortality between smokers and nonsmokers unless the effect of the other factors associated with fetal loss had been neutralized by analytic procedures. Several studies in which no differences were found have not been corrected for the multifactorial nature of perinatal mortality. For example, one of the larger studies (7) did not bring any factor other than smoking into the analysis, even though the authors themselves noted that the proportion of smokers was higher among the white than the black women in their study population, a difference that could mask any increase in perinatal mortality caused by smoking. Possible biases in selection as well as the necessity for correct analytic techniques have been discussed by Meyer and Comstock (8).

The upshot of all this is that here, as in so many areas, physicians have to make decisions and advise patients on the basis of apparently conflicting evidence from observational studies, many of them seriously flawed. The words of Bradford Hill (9), spoken at the Royal Society of Medicine in 1965 in reference to earlier discoveries about the effects of cigarette smoking are still pertinent.

> All scientific work is incomplete—whether it be observational or experimental. All scientific work is liable to be upset or modified by advancing knowledge. That does not confer upon us a freedom to ignore the knowledge we already have, or to postpone the action that it appears to demand at a given time.

On balance, it would seem prudent at this time t treat the relation between smoking and perinatal mo tality as causal. The need for intensified efforts to r duce smoking among women, especially those of repr ductive age, is urgent. (Judith S. Mausner, *The Medic College of Pennsylvania, Philadelphia, Pennsylvania*)

* Unpublished data, Department of Health Education, and Welfare, Health Services and Mental Health Administration, National Clearinghouse for Smoking and Health, CDC, Bethesda, Maryland.

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