

Abstract: From theories that suggest behavior is influenced by direct observation of personal and immediate consequences of the behavior, we hypothesized that public prenatal patients would reduce their smoking if they observed the level of carbon monoxide in their own alveolar air. An experimental design was used that involved 170 subjects, multiple measures of smoking, and data collection before the intervention and six weeks later. It was concluded that the intervention had either a small or no influence on cigarette smoking. (Am J Public Health 1983; 73:1089-1091.)

Introduction

Research suggests that cigarette smoking during pregnancy can harm the fetus, infant, and child. 1-4 Five earlier studies have assessed the influence of interventions intended to reduce smoking during pregnancy. 7-10 A substantial body of theory and research suggests that behavior will be influenced if negative consequences of the behavior are: 1) displayed rather than presented in the abstract; 2) clearly linked to the person and not only to others; and 3) shown to exist in the present rather than offered as a possibility for the distant future. 11-22 Given this guidance, we might expect that telling prenatal patients their smoking will cause lung cancer and heart disease would be ineffective because few could be shown that they have those consequences. In contrast, their behavior might be influenced if they see the level of carbon monoxide (CO) in their alveolar air because that is a concrete demonstration of a current and personal consequence of smoking. Thus, we hypothesized that cigarette smoking would be reduced among public prenatal patients who are shown the level of CO in their alveolar air.

Methods

The orientation sessions to be attended by all women admitted to prenatal care in the Guilford County (North Carolina) Health Department from February 9 to August 4, 1981, were allocated by a table of random numbers to experimental and control groups. During orientation all women in the experimental group sessions were given a breath specimen that was entered into a machine to register by needle the level of CO in parts per million (ppm). The women observed their own CO level and the levels of all others in the session. Smokers and nonsmokers did this together so that their different CO levels could be clearly observed. To make this intervention meaningful, a 135-word script that described the relationships among cigarette smoking, carbon monoxide, and the harmful consequences of smoking during pregnancy was read. Women in the control sessions did not receive the CO intervention, but they were read the script so that CO intervention and script effects could be separated when comparing experimental and control groups. All of these procedures were implemented by the regular health educators at the maternity clinics.

A one-page questionnaire was completed in the clinic at orientation and six weeks later to measure smoking status, and CO level was measured in both groups. In the analyses, CO was measured both as a continuum in ppm, and as related to the commonly used level of CO $\geq$9 ppm to identify recent smokers. 24-30

The findings are for 170 of the 226 women who entered the prenatal program. To assess the possibility of attrition bias, we compared the 170 women in these analyses with those lost to study on 12 variables. 31 Since there was no statistically significant difference between the groups, we conclude that, for these variables, there was no attrition bias. There was also no statistically significant difference

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**The 12 variables were: age, race, marital status, education, parity, gestation, pregnancy risk status, number of weeks between measurements, clinic location, day of study, per cent of session members who were current smokers, and number of women in the orientation session. Risk status was coded on clinic records by clinic professionals as "no risk," "at risk," "high risk." Details of coding scale are available on request to author.
between the experimental and control groups on those 12 variables and smoking behavior at orientation.

Forty-seven per cent of the 170 women studied were current smokers when they entered the prenatal program. They averaged 20 years of age, 40 per cent were married, 43 per cent had completed high school or more education, and 56 per cent were Black. Forty-four per cent were having their first baby and 80 per cent were classified as having no pregnancy risk attributes other than smoking. Thirty-eight per cent were in their first trimester of pregnancy and 46 per cent were in their second trimester.

Results

In Table 1, for current smokers at orientation we show the smoking behavior of experimental and control groups six weeks after the intervention. There was no statistically significant difference in behavior between the groups.

To minimize chance fluctuations across experimental and control groups, we compared the experimental and control groups on the continuous measures of smoking six weeks after orientation when adjusting for smoking behavior at the time of orientation by analysis of covariance. We repeated those analyses when also adding as covariates the 12 variables we used to assess attrition effects and comparison group equivalence. The only difference that emerged with these adjustments was that the level of CO in ppm was lower (p < .04) for the experimental group (X = 14.6) than for the control group (X = 20.1) when all variables entered the model.

Since the intervention might have prevented the initiation of smoking, for those who were not current smokers at orientation we compared experimental and control groups according to the per cents who were smokers six weeks later (not shown). There was no significant difference in smoking behavior between the experimental and control groups.

Discussion

As with any study, the findings might have been different for other populations. Perhaps a large effect would have been observed if the subjects had been private patients, if the intervention had occurred earlier or later in pregnancy, or if the intervention had been combined with physician encouragement or an explicit plan for smoking cessation. Or, substantial effects might have appeared after the six-week measurements. Our findings should not be generalized to all populations, interventions, and conditions.

We found evidence consistent with an effect for only one of many smoking behavior measures and therefore it could be a chance occurrence, produced by introducing so many covariates. If it is an intervention effect, then it must be considered minor because it required our finest measurement scale and inclusion of the covariates. We conclude that the worth of the intervention we evaluated remains to be demonstrated for public prenatal patients.

REFERENCES

Is the Period of Rapidly Declining Adult Mortality in the United States Coming to an End?

RICHARD COOPER, MD, ROBERT COHEN, MD, AND ABAS AMIRY, MD

Abstract: Age-standardized death rates from all causes for persons age 35–74 fell 23 per cent, 1968–1979. The monotonic decline was interrupted by only one period of excess influenza mortality. In the late 1970s, however, the decline in mortality decelerated and no further decrease was observed, 1979–1981. The recurrence of epidemic influenza contributed significantly to this trend although it would appear that the underlying mortality pattern has begun to change. (Am J Public Health 1983; 73:1091–1093.)

Introduction

As is now well recognized, the United States entered a period of rapidly declining adult mortality at the end of the 1960s.1–5 Contrary to much previous public health experience, the gains in adult mortality exceeded those for infants.6 Given a finite life expectancy, the period of rapidly declining mortality must necessarily be limited. Short of that absolute limit, however, it should be possible to identify specific obstacles to improved health. If the end of the period of declining mortality is being reached prematurely, identifying such obstacles becomes particularly urgent.

Methods and Materials

Mortality data were obtained from the National Center for Health Statistics; the 1981 data are provisional. Age-standardization was accomplished by averaging 10 year age groups between 35 and 74.

Results

Trends in the death rates, for adults, ages 35–74, from 1960–1981 are presented in Table 1 and Figure 1. Age-specific death rates for adults remained stable from 1960 until 1969, with the exception of the age group 35–44 which did not begin to decline until the early 1970s. By the late 1970s, the rate of decline had begun to decelerate and no further decrease was recorded 1979 to 1981. The impact of epidemic influenza is also apparent in 1960, '63, '66, '68 and '72 (Figure 1); the relatively mild flu years of the mid-late 1970s ended with a significant return of flu in the winter of 1980–81.4 Smoothing the mortality curves for the impact of epidemic flu, however, does not eliminate the general trend demonstrated by individual years. Dividing the period in four-year segments through 1980, and utilizing a three-year moving average as the data point at the beginning and end of each period, the same pattern obtains (Figure 2). From 1970 through 1976, the average yearly decline for the age groups 35–74 was 2.1 per cent; from 1976 through 1981 the decline was 1.6 per cent per year.

Life expectancy from age 45, reflecting the contribution of declining adult mortality, began to increase after 1968 (Table 2). From 1972 to 1976, an additional 1.2 years were added, while from 1976 to 1980 an increase of 0.6 years was recorded.

The observed trends in mortality rates have not been consistent for all sex-race groups. Unfortunately, age-sex-race specific data are not available for the most recent years. Examining the period of rapid decline, 1968 to 1978, it is apparent that non-Whites enjoyed greater absolute and relative improvement than Whites (Table 3). Life expectancy from birth, which is available through 1980, also demonstrates the disproportionate gains experienced by Blacks (Table 4). The recent modest increase in death rates has affected non-Whites more than Whites (Table 5).

Discussion

Mortality rates among adults in the US began to fall precipitously in 1969; current data suggest that the mortality trend has begun to level off. The primary issue which limits