

# Effect of Pregnancy on Smoking Behavior: A Baseline Study

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The trend of increased smoking among young women has leveled off, yet 22 to 28 percent of pregnant women smoke. Aside from the usual risks of smoking, these women expose their fetuses to increased risk when they are pregnant. Pregnancy may motivate women to stop smoking because of potential adverse effects on their babies' health. A public health survey supported this claim, but no family practice studies have been reported. This is a retrospective study describing women's smoking behavior during pregnancy and at least six months after delivery. Self-administered questionnaires were given to 66 women in three family practices. Women were questioned regarding the number of cigarettes smoked before and during pregnancy and were asked their current level of smoking. Twelve women (18 percent) stopped smoking completely during pregnancy; however, of these 12, only seven (11 percent) were still not smoking at the time of the survey. Twenty-eight women (42 percent) cut down their smoking at least one-half pack per day during pregnancy. Six months to five years after delivery, only 18 of these 28 women were still smoking at least one-half pack per day less. Further study is needed to determine whether intensive antismoking efforts during routine prenatal care would be more effective and long-lasting.

Despite the recent massive public health campaigns against the dangers of tobacco, the incidence of smoking among women is high. Much of this high incidence is due to increased smoking among teenage girls and young women.<sup>1-3</sup> That 22 to 28 percent of American women smoke during pregnancy is even more alarming.<sup>4,5</sup> Yet preg-

nancy may be the ideal time for curing many of these young women smokers of their dangerous habit. Motivation and follow-up reinforcement are two essential elements of smoking cessation programs. Pregnancy provides an ideal opportunity to maximize both of these factors. Strong motivation may be provided by a pregnant mother's knowledge that smoking is hazardous to her baby's health as well as her own. The increased risks of perinatal death, spontaneous abortion, low-birth-weight infants, placenta previa, and abruptio placentae are well documented.<sup>6-8</sup> If these women can be convinced to stop smoking, opportunity for follow-up reinforcement is excellent because of the family physician's continuing contact both dur-

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ing pregnancy and after delivery at well-baby examinations.

With such strong detrimental effects and such a golden opportunity for intervention, one would expect this area to be thoroughly studied. On the contrary, very little has been written in US medical literature about women's attempts to stop smoking during pregnancy. A MEDLINE search of the past three years yielded no primary references studying smoking cessation during pregnancy. An older public health survey conducted in 1975 for the American Cancer Society showed that 35 percent of women stopped smoking during pregnancy.<sup>3</sup> In a 1979 New Zealand study, 23 percent of 503 smokers stopped either prior to or during pregnancy.<sup>9</sup> A smaller British study in 1976 revealed only 15 percent cessation among 134 pregnant smokers.<sup>10</sup> These studies were descriptive, with no special attempts other than routine prenatal care made to discourage smoking.

A small intervention trial by Danaher et al<sup>11</sup> published in 1978 in the *American Journal of Public Health* showed that, of 11 pregnant women participating in a special stop-smoking program, nine reported reduced smoking during pregnancy. Of these, four quit entirely during pregnancy, but there was no long-term follow-up. No recent articles on spontaneous smoking cessation or on long-term follow-up of smoking cessation during pregnancy were found in the US medical literature.

This paper reports a baseline study of smoking in pregnancy in which a simple retrospective family practice-based descriptive study was designed to discover what happens without special interventions to American women's smoking behavior during pregnancy. An attempt was made to discover whether there is any long-lasting effect of smoking cessation during pregnancy.

## Methods

Three Michigan family practice offices participated in a survey of pregnant women's smoking habits. The offices included the St. Lawrence Family Practice Residency in Lansing, a rural family practice clinic in Algonac, and a rural undergraduate model family practice clinic in Escanaba associated with the Michigan State University College of Human Medicine.

Women of childbearing age presenting to the office for any reason were screened for participa-

tion in the study. The total number of women screened was not tallied. Criteria for inclusion in the study were as follows:

1. The candidate must have been a smoker prior to her most recent pregnancy.
2. She must have had at least one full-term pregnancy, and the child of that pregnancy must be at least 6 months, but not more than 5 years old.
3. The candidate could not be pregnant at the time of the survey.
4. She must not have responded previously to the questionnaire.

Once a candidate had been identified, she was given a simple questionnaire to fill out regarding her most recent pregnancy. The questions were self-explanatory, and the receptionists were provided with procedure flow sheets to aid with any difficulties the respondents may have had. Twelve items were included in the survey: (1) age, (2) race, (3) employment outside the home, (4) highest level of education completed, (5) number of children living at home, (6) number of children delivered, (7) the age at which the patient began smoking, (8) the date on which her youngest child had been born, (9) the number of years she smoked prior to the most recent pregnancy, (10) the amount smoked immediately before her most recent pregnancy, (11) the amount smoked during the last month of her most recent pregnancy, and (12) the amount smoked currently.

The survey was conducted from June through November 1982. As implied above, women who had delivered within six months were excluded from the study, since an attempt was being made to see if decreased smoking during pregnancy had any lasting effect. To obtain a larger sample, several sites were used. No attempt was made to look for differences among sites. As this was a retrospective baseline study, no special attempts had been made to encourage the women to stop smoking. It is assumed that they all had routine prenatal care.

## Results

Though the total number of women screened was not tallied, all 66 women who met the criteria completed the questionnaire. Demographic data describing these women are given in Table 1. The average age at onset of smoking was 15 years old. The average amount smoked prior to the most re-

**Table 1. Demographic Description of the Women Smokers Studied (n=66)**

	No.	Percentage
Age (yr)		
18-19	6	9
20-24	31	47
25-29	20	30
30-34	5	8
35-40	4	6
Gravidity		
Primigravida	37	56
Two	16	24
Three	7	11
Four	2	3
Five	2	3
Over five	2	3
Race		
White	56	85
Black	4	6
Hispanic	2	3
Native American	4	6
Education (highest grade completed)		
Junior high	9	14
High school	44	67
College	13	19
Employment		
Full-time	8	12
Part-time	7	11
Unemployed	51	77

cent pregnancy was 1.3 packs per day. Of the 66 women, 12 (18 percent) stopped smoking completely during pregnancy, and seven of these women were still not smoking at the time of the survey six months to five years after delivery. Seven women (11 percent) did not quit during the pregnancy but were not smoking at the time of the study.

Twenty-eight women (42 percent) cut down their smoking at least one-half pack per day during the pregnancy, including the 12 women who stopped smoking. Eighteen women (27 percent) were still smoking at least one-half pack per day less at the time of the survey.

## Discussion

From this study pregnancy alone appears to have some effect on smoking behavior but does not appear to be a powerful motivator to stop

smoking. Only 18 percent of the women studied stopped during pregnancy, less than the 35 percent quoted in the US Public Health monograph cited earlier. These results are consistent with the New Zealand and British studies showing 23 percent and 15 percent spontaneous smoking cessation, respectively.<sup>9,10</sup>

Pregnancy seems to be an even less powerful motivator for long-term smoking cessation. Only seven women, or 11 percent, remained nonsmokers at six months to five years after delivery. Interestingly, seven women continued to smoke during pregnancy but had quit by the time of the study, leading one to suspect that seven women stopping during pregnancy could have occurred by chance. Without a nonpregnant control group, and with such small numbers, this question remains unanswered.

Nonetheless, pregnancy alone, in the absence of special interventions, does seem to provide motivation for women to cut down on cigarette consumption. Twenty-eight women (42 percent) were able to get by on at least one-half pack per day less than they smoked prior to pregnancy. Such a decrease is unlikely to occur spontaneously. Of those 28 women, 18, or 27 percent of the original sample, were still smoking at least one-half pack per day less than they had smoked prior to pregnancy when surveyed six months to five years later. Unfortunately, there was no control group for comparison.

As mentioned previously, no special attempt was made to discourage these women from smoking during pregnancy. Comparing these results with those of Danaher's intervention trial, one sees that one half of Danaher's positive results may have been the baseline effect of pregnancy (Table 2). The additional positive results are encouraging nonetheless. Further research is needed to determine whether such good or even better results could be obtained with a larger study group.

Despite the need for further data, clinicians should make every effort to encourage their pregnant patients to stop smoking. The Massachusetts Department of Public Health, in a 1978 *New England Journal of Medicine* article, made the following recommendations<sup>12</sup>:

1. Cigarettes should be included in the list of drugs known to adversely affect the outcome of pregnancy.

Table 2. Comparison of Results of an Intervention and a Nonintervention Trial		
	Nonintervention (Hickner et al) n = 66	Intervention (Danaher et al <sup>11</sup> ) n = 11
	No. (%)	No. (%)
Stopped smoking	12 (18)	4 (36)
Reduced smoking*	28 (42)	9 (82)
No change or increase	38 (58)	2 (18)

\*Includes those who stopped smoking

2. Pregnant women smokers should be told that they are at especially high risk if they have had a history of previous perinatal loss or placental complications, if they are anemic, or if they are in the older age group.

3. The physician should consider obtaining a carboxyhemoglobin level on pregnant smokers and show the abnormal results to the patient.

4. Any woman with bleeding during pregnancy should again be questioned regarding her smoking behavior and warned about the dangers of cigarettes.

5. The physician should have a list of local stop-smoking programs to give to pregnant smokers.

6. Smoking should not be allowed in patient care areas, and prominent "No Smoking" signs should be displayed in these areas.

7. Third-party payers should cover the cost of approved stop-smoking programs.

8. The cigarette package warning labels should be revised to include the statement "Smoking During Pregnancy Increases the Risk of Complications and the Risk of Death of the Unborn Baby or Newborn Infant."

In summary, this study provides some baseline data describing women's smoking habits during pregnancy. Women do smoke less during pregnancy, and the percentage who stop smoking completely is less than 20 percent. There is encouraging evidence from a small study that intensive effort during pregnancy may motivate more women to quit. A larger study is needed to determine the effectiveness of a stop-smoking program that can be incorporated into routine prenatal care, since only a minority of pregnant women seem motivated to attend special stop-smoking sessions.<sup>13</sup> As 22 to 28 percent of pregnant women

smoke, such a program would have wide application and excellent potential for preventive health care. The American Lung Association has developed a patient education kit specifically designed for pregnant smokers and their health care providers. This kit is now available to physicians, and tests of its effectiveness are needed.

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