ORIGINAL CONTRIBUTION

A Prenatal Hypnosis Smoking Cessation Program: A Preliminary Report.

John R. Colwell, B.Sc. and Donald C. Brown, M.D.

Dept. of Family Medicine, Faculty of Medicine, Dalhousie University, Halifax, Nova Scotia, B3H 4H7

This report presents results of a study on the effectiveness of a prenatal group hypnosis smoking cessation program. The postpartum smoking behaviours of those who stopped smoking during the pregnancy are also presented. The multifactorial inter vention emphasized is the use of multiple hypnosis sessions with accompanying information booklets and personal physician encouragement. This study group of 55 people included both pregnant women and their significant others who lived with them and smoked. Only 83% follow-up was achieved of the 47 patients eligible for analysis (n=39). Results showed a quit rate of 18% and positive smoking behaviour changes in 90% of the study group. Of those 7 individuals who quit during pregnancy, only two resumed smoking at three and six months, respectively. These preterm and postpartum preliminary results are promising given the small sample size of the study and the potential room for improvement of this intervention modality.

INTRODUCTION

Ill effects of maternal smoking to the fetus and the newborn are well documented in the literature. The most well-established of these is an increased risk of intrauterine growth retardation which has been recognized since 1957 (1,2). This is significant given that low birth weight (<2,500 g) is the chief predictor of infant death. Other consequences include a significant increase in the risk of stillbirth, spontaneous abortion, premature delivery, and neonatal death (3). Recent studies have found that maternal smoking also increases the risk of childhood cancer (4). In fact, smoking during pregnancy is the single most important preventable cause of fetal loss and prenatal mortality and morbidity (3). In addition, smokers produce less breast milk with higher levels of nicotine making babies prone to intestinal colic (5). There is also some evidence that maternal smoking may cause behavioural problems and less than optimal development of the child (2,6). These risks to the fetus are in addition to the considerable risks of smoking incurred by the mother herself. About 20% of all deaths in developed countries are caused by smoking (7).

Despite these known risks, the prevalence of prenatal smoking remains high. The proportion of North American women who smoke during pregnancy has been estimated to be around 25 percent (1). Some recent studies report the prevalence of prenatal smoking in women as high as 37%, 37.4%, and 45% (8). A recent study by Dodds (9) found that 32.4% of pregnant women less than 20 years of age smoke during pregnancy and this decreased with each increasing 5-year interval. However, the group with the highest rate (56.6%) was among unmarried women aged 25-29. The study also revealed that smoking rates in this population have decreased little between 1988 and 1992, suggesting that current strategies for smoking cessation in Nova Scotia have not been successful.

It is estimated that between 18 and 22% of smoking pregnant women will quit smoking by the time of their first antenatal visit (1,10). It is also estimated that 25% of women will continue to smoke

Address correspondence to:

Dr. Donald C. Brown, Dept. of Family Medicine, Faculty of Medicine, Dalhousie University, Halifax, Nova Scotia, Canada B3H 4H7

throughout pregnancy (1). Condon and Hilton (11), in a study comparing pregnant women's smoking and drinking behaviours, found that 100% reduced their drinking while only 57% lowered their cigarette consumption. The difference reflects the 40% who tried to smoke less but failed. An Ottawa study reports that 37.4% of women smoked before pregnancy. Overall, 61.1% of the smokers changed their smoking habits: 31.1% stopped, 28.1% smoked less, and 2% smoked more. Two thirds of the women who stopped smoking did so as soon as they realized they were pregnant (12).

A decade of research supports the conclusion that smokers, in general, need more than information and encouragement, even from their physicians, to succeed in quitting (3). It has also been recognized that health education methods specifically tailored to pregnant smokers are more effective than standard advice and information (e.g. booklets, use of smoking cessation materials) in changing smoking behaviour (1,13,14). A counselling approach (providing more time and physician-patient interaction than advice alone does) helps the smoker determine a plan for cessation and is associated with higher cessation rates (8). Overall, the most reliably effective intervention programs in the physician/health professional setting are those providing firm, consistent, and repeated help and advice to stop smoking (15).

One of the most successful means of treating a patient with the problem of cigarette smoking is with hypnosis (16). Although reports regarding the effectiveness of hypnosis as a means of smoking cessation are not consistent, hypnosis can help some smokers quit, particularly those who have tried other methods and need individual attention to succeed (14). In and of itself, hypnotherapy is not a treatment (17). Hypnosis is a modality that can be used with any other smoking cessation program. It is uniquely effective in helping individuals to achieve what they already want to do in that it is an adjunct to the patient's will to quit (14). As one might expect, there is no other patient that is more responsive to behaviour change than the expectant mother. This is illustrated in a study of 1900 women in which 41% of the women quit smoking just before becoming pregnant or when pregnancy was confirmed (18). Hypnosis produces only modest results when used alone, but when combined with other cessation methods, the success rates are enhanced (10). Frank (19) found that when hypnosis sessions were placed close together and multiple sessions were offered, 60% of the subjects had stopped smoking at the end of treatment. The use of hypnotherapy in a cessation program targeting smoking pregnant women is an area that has received little attention in the published literature.

Here, we present the results of a prenatal group hypnosis smoking cessation program. This approach emphasizes the use of a number of treatment modalities (the focus being hypnosis) and promotes multiple reinforcement sessions. Because this intervention strategy is available to women in their postpartum period as well, those who were able to quit for a period in their pregnancy until at least delivery were further evaluated in terms of their postpartum smoking behaviour.

METHODS

The prenatal group hypnosis smoking cessation program was made available at the Dalhousie University-affiliated Grace Maternity Hospital, Halifax, Nova Scotia. The program was initiated by Dr. Donald Brown in May of 1993. Patients were referred by their family physicians, obstetricians, friends, family, prenatal class instructors or by self-referral. Some patients obtained information from brochures and posters. Patients paid six dollars for the first session and five dollarsfor subsequent visits each lasting between 60 and 90 minutes. Although advertised as a group hypnosis program, only 56% of individuals attended the session with someone else. This was likely due to the "walk-in" nature of the program.

Treatment methods were similar to those described in Berkowitz *et al.* (20). Briefly, the hypnotherapy method began by taking a brief clinical and smoking history. The patient was then taught a number of inductions [e.g. three deep breaths (21) and the Spiegel technique (22)] as well as a number of deepening techniques depending on which helped each patient relax most effectively. Emphasis focused on learning how to relax, remaining in control, and replacing the old habit of smoking with a new habit of auto hypnosis. For example; visualizing one's self at the beach, seashore or favourite secret resting place where he or she feels comfortable, safe and secure. While in a trance the patient was taught three basic slogans: 1) for my body and my baby smoking is a poison; 2) my baby and I need our bodies to live in; and 3) I owe my body and baby this respect and protection. The patient was instructed to terminate the trance and encouraged to perform at least 3 trances per day indefinitely (22). Positive suggestions were offered emphasizing the individual's own responsibility for his/her success. Specific ego-strengthening techniques were used to facilitate a positive response to auto hypnosis (23). The entire approach emphasized the patients' active participation.

One of the elements of a successful cessation program is the number of reinforcing sessions (1). It was therefore suggested that the patient return later for another session and to bring an audiotape to record the session (to be used as further reinforcement thereafter). Also, after completing the first visit, information booklets regarding auto-hypnosis (24) and smoking cessation (25) were given to the patient. It was hoped that the family physicians and/or obstetricians of the patients assessed and encouraged their efforts to quit or reduce their smoking habit. Reinforcing sessions were used to review the patient's smoking status and to make

an audiotape with a specific stress prevention and stress management program.

At the first visit, each person recorded their name, address, telephone number and name of their family physician on a filing card. Follow-up data was collected by telephone via questionnaire interviews. Between 25 May 1993 and 30 March 1995, 55 people attended the hypnosis sessions. The program was open to anybody who wished to quit smoking during pregnancy. The study included only patients who were smokers and pregnant, or who were smokers and living with a pregnant woman (whose first visit was in the preterm period). Smokers living with a pregnant woman were included in the study because of the belief that they have a direct influence on successfully changing maternal smoking behaviour (26,27). Further, there is evidence that passive smoking is significantly associated with lower birth weight children in women who do not smoke (3,28). By these criteria, only 47 of the 55 people were eligible for the study. Reasons for exclusion included: non-pregnant women looking for smoking cessation therapy and not living with someone pregnant (n=3), non-smokers who came as support (n=3), the first visit occurred during postpartum period (n=1), and one woman seeking hypnosis for labour and delivery (n=1). Because of relocation of patients and unlisted or changed telephone numbers, only 83% follow-up of these 47 patients was achieved (n=39). Only the 39 contacted were included in the final analysis. Contact was made an average of 13.5 months after the initial session (range = 2 to 23 months). There were 33 women and 6 men with a mean age of 30 (range = 21 to 36 years) who had been smoking for a mean of 12.3 years (range = 2 to 25 years). Education, age, marital status, parity, and living with another smoker have been found to be predictors of smoking behaviour in pregnant women (18, 26, 27). It has also been stated that in the postpartum period, those who formula-fed their babies were more likely to relapse into smoking again (18). Predictors of smoking cessation using hypnosis include those who have previously quit smoking for greater than one month (17), motivated smokers (29), and those with a college education (30). Data was collected for the above variables but, due to the small sample size of this study, analysis was not done.

Because of the direct relationship between the number of cigarettes smoked and the risk of perinatal mortality and morbidity (1,3,32), any decrease in the amount of cigarettes smoked was considered a successful outcome. Knowing the number of cigarettes smoked is important but knowing when the reduction occurred during the pregnancy is also important (3). It has been shown that if a pregnant smoking woman quits before 16 weeks gestation then the infant birth weights are similar to those of non-smokers (33). Quitting after 16 weeks or stopping temporarily resulted in babies of intermediate birth weight (33). Studies show a large birth weight reduction when a woman smokes up to 15 cigarettes a day during pregnancy (32).

After the first hypnotherapy session until the follow-up contact, four separate categories of smoking behaviour were noted:

1. *Stoppers*: Those who quit at some point after the hypnotherapy and remained non-smokers until at least the delivery of their child.

2. *Temporary stoppers*: Those who quit at some point after the hypnotherapy but resumed smoking before delivery.

3. *Reducers*: Those who reduced the number of cigarettes they smoked per day relative to before they hypnotherapy and maintained this reduced number until at least delivery.

4. *Persistent smokers*: Those who did not change their smoking behaviour after the hypnosis.

RESULTS

Preterm:

Stoppers: This group contained seven people with a mean daily number of cigarettes smoked before pregnancy of 18.4 (range=nine to 25 per day). Of these, five stopped before 16 weeks gestation and one had not yet delivered at the end of the study period.

Temporary stoppers: The mean duration of abstinence was 6.2 weeks (range=two days to five months). Nine people stopped temporaily, with five being before 16 weeks and four after 16 weeks. The mean daily consumption on restarting was 12.4 cigarettes (range=two per week to 25 per day). Before hypnotherapy, mean daily cigarette consumption was 17.6 (range=eight to 25 per day).

Reducers: Mean daily cigarette consumption before hypnosis was 21.7 (range=10 to 50). Mean daily consumption after hypnosis was 10.3 cigarettes per day (range=three to 25). Of the 19 reducers, six had hypnotherapy before 16 weeks and 13 after 16 weeks.

Persistent smokers: Four people did not change their smoking behaviour after hypnosis. The mean daily consumption of cigarettes was 25 (no range).

Notably, three people, all of whom were temporary stoppers, in the study used adjunctive methods of smoking cessation (two of which used transdermal therapy [Habitrol] and one had acupuncture). Four people had changed their smoking behaviour prior to the hypnotherapy (one stopper and three reducers). They were still included in the study as they maintained their respective changes until at least delivery. The hypnosis can be seen as an adjunct to a strong will just as hypnosis is an adjunct to other external means of smoking cessation. Also, patients in this study who were heavier smokers had greater difficulty stopping smoking. This is further illustrated by their mean daily cigarette consumption (persistent smokers, 25; reducers, 21.7; temporary stoppers, 17.6; stoppers, 18.4).

The common approach used to interpret incom

plete follow-up after treatment with hypnosis is to count those who were not contacted as recedivists when doing the final analysis (20). This was not done in this case, however, because of the small sample size. Only those contacted were included in the final analysis.

Only 26% (n=10) of the participants attended more than one hypnotherapy session [30% of whom (n=3) used the audiotape] and only 28% of the study group did at least 3 trances per day for a mean length of 16 days (range=1 to 30 days). These results suggest that a higher success rate is plausible with more complete application of this intervention modality.

Most women felt that the hypnotherapy sessions were helpful to their goal of smoking cessation, even if they were not successful. Of those who were unable to quit, the most common reasons identified were a lack of motivation (i.e. not wholly committed to quitting), and the need to experience multiple therapy sessions.

Postpartum:

In the postpartum analysis, one woman was not included because, although she had quit, she had not yet delivered. Of those who had quit for a period during pregnancy until delivery, one of six (16%) had resumed smoking three months after delivery and two of six (33%) had resumed smoking six months after delivery. Of those who cut down for a period during pregnancy, 56% resumed smoking the number of cigarettes they had smoked before the hypnotherapy session immediately following delivery.

DISCUSSION

We found that the use of a multifactorial intervention focusing on hypnotherapy with adjunctive education and encouragement targeting smoking pregnant women resulted in a quit rate of 18% and positive smoking behaviour changes in 90% of the study group.

In 1986, Windsor and Orleans (34) evaluated eight intervention studies and found the most successful study used a multifactorial intervention program yielding a 28% quit rate. Another study by Li *et al.* (3) reviewed smoking cessation programs specifically designed for pregnant women. Among four randomized clinical trials, smoking cessation rates of 14% to 26% among pregnant smokers were documented (3). In a summary of quit rates of smoking cessation trials in the general population, Schwartz (14) found that individual hypnosis and group hypnosis had median quit rates of 25% and 34%, respectively.

Valbo and Nylander (35) reported the results of an intervention consisting of a self-help manual that involved a ten day program for smoking cessation, education regarding the negative effects of smoking in pregnancy, and reinforcement at ultrasound examinations. The result was a 20% cessation rate with 85% positively changing their smoking behaviour. Our results are similar to the rates reported in these previous studies. However, the intervention methods of all the studies mentioned above varied in form, intensity, periods of observation and smoking status, thereby making it difficult to compare them directly with this study.

Regarding postpartum smoking behaviour, in the U.S. about 50% of women who stop smoking during pregnancy resume the habit within three months after the baby is born and 70% restart within one year (1). Although our sample size is small, only 16% and 33% of those who quit during pregnancy had resumed smoking at three and six months postpartum, respectively.

The study design at present needs improving. The greatest drawbacks are that it is not controlled and the sample size is very small. As the study group enlarges, it is hoped that a suitable control group will be entered so as to statistically validate results in the future.

Three areas of this intervention also need improvement. First, the need for multiple sessions for reinforcement has to be emphasized as only 26% of the study group attended more than one session. Also, with multiple sessions, more people would be able to produce an audiotape. Interestingly, of the three people who used a tape, two quit smoking and one quit temporarily. The second area of improvement involves stressing the need for people to make a commitment to perform three trances per day. This is a crucial aspect of the intervention. With multiple sessions, compliance would likely improve. Thirdly, a means of ensuring support and encouragement from the family physician that can be quantified must be developed. One possibility includes the use of a "smoke card" (36) that could be made available to physicians so they can record the progress of the patient at each visit. This would at least offer proof of discussion and the number of discussions communicated.

Problems with the telephone follow-up method included a sometimes lengthy period of time between treatment and follow-up contact and the questionable accuracy of the patient's self-report. If the time before contact was lengthy, some respondents appeared to guess at questions that involved a time variable (e.g. When during your pregnancy did you quit or cut down? For how long did you quit? If you quit, how long after pregnancy did you resume smoking?). Also, biochemical measures (e.g. expired carbon monoxide, saliva thiocyanate, carboxyhemoglobin levels, urinary or sputum nicotine levels) of smoking status should be used during the follow-up period to corroborate reports of smoking abstinence (14, 30).

The present study is, to our knowledge, the first hypnosis multicomponent smoking cessation intervention targeting pregnant smokers. These preliminary results, both preterm and postpartum, are promising as they compare favourably with results from other smoking cessation methods despite the potential room for

improvement of this intervention modality.

REFERENCES

1. Floyd RLL, Zahnisser SC, Gunter EP*et al.* Smoking during pregnancy: prevalence, effects and intervention strategies. *Birth* 1991;18:48-53.
2. Moore KL, Persuad TUN. Clinically Oriented Embryology: The Developing Human. W.B. Saunders, Toronto, 5th Ed. 1993. p158.
3. Brown, D. Smoking cessation in pregnancy. *Can Fam Phys* 1995;41 (in press).
4. John EM, Savits DA, Sandler DP. Prenatal exposure to parent's smoking and childhood cancer. *Am J Epidemiol* 1991;133:123-132.
5. Matheson F, Nylander G. The effect of smoking on lactation and infantile colic. *JAMA* 1989;261:42-43.
6. Dunn HG, McBurney AK, Ingram S *et al.* Maternal cigarette smoking during pregnancy and the child's subsequent development: physical growth to the age of 6.5 years. *Can J Public Health* 1976;67:499-505.
7. Wald NJ, Hackshaw AK. Cigarette smoking: an epidemiological overview. *Br Med J* 1996;52:3-11.
8. Brown D. A medical hypnosis group prenatal smoking cessation program: proposal to the Grace Maternity Hospital research committee. Aptil 26, 1993.
9. Dodds, L. Prevalence of smoking among pregnant women in Nova Scotia from 1988 to 1992. *CMAJ* 1995;152:185-190.
10. Lumley, J. Stopping smoking. *BriJ Obs Gyn* 1987;94:289-294.
11. Condon JT, Hilton CA. A comparison of smoking and drinking in pregnant women: who abstains and why. *Med J Aust* 1988;148:381-385.
12. Stewart PJ, Dunkley GC. Smoking and health care patterns among pregnant women. *CMAJ* 1985; 33:989-944.
13. LeFevre M. Preventing the complication of preterm birth. *Am Fam Phys* 1992;46:441-448.
14. Schwartz, JL. Methods of smoking cessation. *Med Clin North Am* 1992;76:451-476.
15. Kottke TE, Battista RN, DeFriese GH *et al.* Attributes of successful smoking cessation interventions in medical practice. A meta-analysis of 39 controlled trials. *JAMA* 1988;259:2882-2889.
16. Crasilneck HB. Hypnotic techniques for smoking control and psychogenic impotence. *Am J Clin Hypnosis* 1990;32147-153.
17. Spiegel D, Frishcol EJ, Fleiss JL *et al.* Predictors of smoking abstinence following a single-session restructuring intervention with self-hypnosis. *Am J Psychiatry* 1990;150:1090-1097.
18. O'Campo P, Faen RR, Brown H *et al.* The impact of pregnancy on women's prenatal and postnatal smoking behavior. *Am J Prev Med* 1992;10:8-13.
19. Frank RG, Umlauf RL, Wonderlich SA *et al.* Hypnosis and behavioural treatment in a worksite smoking cessation program. *Addictive Behaviours* 1986;11:59-62.
20. Berkowitz B, Ross-Townsend A, Kohberger R. Hypnotic treatment of smoking: the single treatment method revisited. *Am J Psychiatry* 1979;136:83-85.
21. Alman BM, Lambrou PT. Self Hypnosis: the complete manual for health and self-change. 2nd Ed. Brunner/Mazel, New York; 1992, pp 39-48.
22. Spiegel H, Spiegel D. Trance and Treatment: Clinical Uses of Hypnosis. Basis Books Inc. Pub., New York; 1978. p76.
23. Hartland J. Further observations on the use of "ego-strengthening" techniques. *Am J Clin Hypnosis* 1971;14:1-8.
24. The Canadian Council on Smoking and Health: your guide to a smoke free future. 1993.
25. The Canadian Council on Smoking and Health: a new start in life -about pregnancy and smoking.
26. Madeley RJ, Gillies PA, Power FL*et al.* Nottingham Mothers Stop smoking project - baseline survey of smoking in pregnancy. *Community Medicine* 1989;11:124-130.
27. Cnattingius S, Lindmark G, Meirik O. Who continues to smoke while pregnant? *J Epidemiol Community Health* 1992;46:218-221.
28. Fortier I, Marcoux S, Brisson J. Passive smoking during pregnancy and the risk of delivering a small-for-gestational-age infant. *Am J Epidemiology* 1994;139:294-301.
29. Neufield V, Lynn SJ. A single-session group self-hypnosis smoking cessation treatment: a brief communication. *Int J Clinical Exp Hyp* 1988;15:75-79.
30. Lambe R, Osier C, Franks P. A randomized controlled trial of hypnotherapy for smoking cessation. *J Fam Prac* 1986;22:61-65.
31. Sexton M, Hebel JR. A clinical trial of change in maternal smoking and its effect on birth weight. *JAMA* 1984;251:911-915.
32. Goldstein H. Smoking in pregnancy: some notes on the statistical controversy. *Br H Prev Soc Med* 1977;31:13-17.
33. MacArthur C, Know DG. Smoking in pregnancy: effects of stopping at different stages. *Br J Obst Gyn* 1988;95:551-555.
34. Windsor RA, Orleans CT. Guidelines and methodological standards for smoking cessation intervention research among pregnant women: improving the art. *Health Educ Q* 1986;148:381-385.
35. Valbo A, Nylander G. Smoking cessation in pregnancy: intervention among heavy smokers. *Acta Obstet Gynecol Scand* 1994;73:215-219.
36. Solberg LI, Maxwell PL, Kottke TE *et al.* A systematic primary care office-based smoking cessation program. *J Fam Pract* 1990;30:647-654.