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# What Is The Most Effective Way To Help Pregnant Smokers Quit: Telephone Counseling Or Midwife Delivered Home Based Counseling?

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## Citation

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## Abstract

Currently 11% – 22% of pregnant women in the United States smoke throughout pregnancy. The effects that smoking has on the development of the fetus include low birth weight, preterm delivery and other serious problems. Peri-natal and neo-natal deaths increase by 33% in the offspring of smokers. Therefore, it is important as clinicians to determine which smoking cessation method will be most effective in the pregnant population. This article compares two methods of smoking cessation, telephone counseling and home based counseling. The purpose was to determine which method was most effective in the pregnant population. The results of this analysis clearly show that neither method significantly reduced the number of pregnant smokers as compared to their control group. This analysis proves that despite the importance of smoking cessation in pregnancy, there is no effective method to help pregnant smokers quit and more studies need to be completed.

## INTRODUCTION

This article will address two methods of smoking cessation; motivational counseling by midwives and motivational counseling by other professionals via telephone. The purpose of this article is to attempt to find an effective smoking cessation method for pregnant women, in turn, reducing the number of adverse affects to the fetus.

Television ads, magazine advertisements, and billboards all expose the adverse effects of smoking on the human body. Since, a fetus is part of a woman's body for nine months, it makes sense that there are similar health affects on that fetus. 11% to 22% of pregnant women in the United States smoke throughout pregnancy.<sup>1</sup> Tobacco use during pregnancy continues to be the leading preventable cause of low birth weight.

Overall, efforts to reduce smoking in the general population are growing. Despite these efforts, nearly 400,000 deaths still occur each year from the abuse of tobacco products.<sup>2,3</sup> New drugs are coming to market and smoking cessation programs are available in nearly every community. Less can be said, however, about efforts to reduce smoking in pregnancy. All of the new smoking cessation drugs are Category C drugs. Therefore, there is not enough information known about the drug to use it safely during

pregnancy. Nicotine replacement is also controversial. Regardless, the high number of pregnant smokers necessitates a more in depth look at these methods in pregnant women.

Current clinical practice guidelines to aid in smoking cessation suggest brief counseling of 3-5 minutes and supplemental written material; however, cessation rates generated by these recommendations are modest at best.<sup>1</sup> Although reducing smoking during pregnancy is a United States Public Health Goal for 2010, current research is lacking an effective, safe, and economical way to promote smoking cessation during pregnancy.<sup>1</sup> Brief counseling is ineffective and nicotine replacement and other pharmacologic methods are controversial. These issues provide pregnant smokers with very few options. In contrast, there is some current research on motivational counseling, a less controversial method of smoking cessation. <sup>1</sup> Its effectiveness will be discussed later in this article. Clearly, a better method must be found if the Public Health Goal for 2010 is going to be met.

## METHODS

A literature search was completed via computer within the following databases: CDC, PubMed, Ebsco, CINAHL, Science Full Text (Wilson), and Lexis-Nexis academic

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universe. The databases were searched for various combinations of the following search terms: smoking cessation, methods, pregnancy, midwife counseling, telephone counseling, effective, quit smoking, and pregnant smokers.

The best type of study to decide the most effective smoking cessation method would be a randomized controlled study. This type of study is best for answering a question about prevention and therapy. The type of therapy we are testing (counseling) does not allow for double-blinded studies. This is because the persons doing the counseling needed to know which intervention they would be giving. In fact, if the counselors did not know which group they were in, they could inadvertently bias the study by providing too little or too much counseling. The study could not be blinded because the counselors needed to know their boundaries. However, persons interpreting the results could be blinded so they are not aware of which group they are analyzing in order to eliminate bias.

These topics were lacking abundant, appropriate studies. However, two recent, relevant and statistically sound studies were found on the PubMed site. One study was on Midwife counseling (Aug 05) and the other on telephone counseling (July 06). These studies were chosen because they were the most up to date articles on this topic.

### **BACKGROUND**

Peri-natal and neonatal deaths increase by 33% in the offspring of smokers. <sup>4</sup> Nicotine is a powerful vasoconstrictor that reduces uterine and placental blood flow. This can lead to problems such as spontaneous abortion and placental abruption.<sup>4</sup>

It is a well-known fact that smoking causes low birth weight. The magnitude of the weight difference is directly proportional to the number of cigarettes the mother smoked. The mechanism for this decreased birth weight is unclear, but decreased nutritional intake, as a cause, has been ruled out. <sup>4</sup>

A study done by Scott Montgomery, PhD and colleagues has also linked obesity and diabetes in the offspring as long-term complications of in utero nicotine exposure. "The authors suspect that both diabetes and obesity may stem from 'lifelong metabolic dysregulation, possibly due to fetal malnutrition or toxicity caused by smoking during pregnancy.'" <sup>5</sup>

Other disorders that are shown to be increased in the offspring of pregnant smokers are childhood cancer, SIDS, and decreased intellectual functioning.<sup>3</sup> The specific pathophysiologies for these disorders has yet to be identified.

Given these well-documented detrimental effects of smoking, it is becoming more and more important as clinicians to decrease the number of pregnant women who smoke. We now know that smoking not only affects the fetus, but also affects the offspring for decades to come. The trouble is that smoking cessation methods continue to prove themselves inadequate in pregnant women.

One method that may increase smoking cessation in pregnancy is motivational counseling. Certified Nurse Midwives or other trained professionals can do this. It can take place in offices, patients' homes, or via telephone. Motivational counseling is a one to one counseling style that is used extensively in smoking cessation training courses.<sup>1</sup> It is a well-studied method of smoking cessation and has been proven effective for the general population. However, it has been proven ineffective in several dated studies with pregnant women.<sup>6</sup> Motivational counseling uses a non-paternalistic, non-judgmental method to facilitate the patient's independent initiative to positive health behaviors. When implemented correctly, it can be used to treat various substance abuse disorders, and influence diet and exercise.<sup>6</sup>

The use of nicotine replacement and bupropion or other pharmacological methods are relatively unstudied in the pregnant population and therefore cannot be recommended. Future studies need to explore this much needed area, since counseling methods of smoking cessation are challenging and time consuming. There are also homeopathic remedies to help persons quit smoking. Acupuncture and hypnosis have become more popular in the last few decades for smoking cessation. Evidence can be found both for and against the use of these two methods in pregnancy. These treatments are also unproven for smoking cessation in pregnancy and therefore, like the pharmacologic methods, need to be studied more thoroughly.

### **DISCUSSION**

#### **STUDY #1**

The first article is a study called "Efficacy of Telephone Counseling for Pregnant Smokers." It was published in *Obstetrics and Gynecology* in July of 2006 by Rigotti NA, et.al.<sup>1</sup> This study was a randomized controlled study

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performed from September 2001 to July 2004 in Massachusetts. It was one of only two up to date studies on this topic. This study was designed to compare proactive pregnancy tailored telephone counseling to “best practice” brief counseling (control). The outcome to be measured was cotinine-verified smoking cessation at the end of pregnancy. Cotinine is a metabolite of nicotine found in blood, urine and saliva and normally remains in the body for two to four days after exposure to nicotine.<sup>7,8</sup> Therefore, a way to assess study participants truthfulness about smoking cessation is to measure plasma or salivary cotinine levels.

Pregnant smokers were originally recruited from two separate sources: a managed care organization and a group of community based prenatal providers. However, since this did not yield a sufficient number of participants 140 other obstetric care providers were invited to refer patients and 35 of the providers referred one or more participants.

The study included 442 pregnant smokers. The pregnant women had a mean gestational age between 12 and 13 weeks. Participants were selected at their prenatal visits if they were older than 18, had smoked at least one cigarette in the past seven days, were English speaking and planned to live locally for the next year. The patients also had to be reachable by phone and willing to consider altering their smoking habits during pregnancy.

Women who had miscarried, had been smoke free for the past week and women who were referred after 26 weeks of gestation were not included. Of the 1,444 women referred, 657 were not eligible, 122 were unable to be contacted and 223 refused to participate.

Participants were not required to sign a commitment to quit. This was done in an attempt to include all smokers and broaden the study. It was thought that this would reduce the number of people who refused to participate because of the fear of not being able to quit.

The women were randomized by computer-generated randomization into two groups. They were matched for a multitude of factors including age, cigarettes per day, race, depressive symptoms and confidence in ability to quit as well as many others.

Intervention subjects received a series of telephone calls scheduled according to their needs. After each call, participants received a summary letter of the call and targeted written material. The intervention group received a

mean of five calls throughout the study. Participants were allowed up to a total of 90 minutes of counseling during pregnancy and a total of 15 minutes post partum. The participants in the intervention group received an average of 68 minutes of counseling.

The control group received a pregnancy tailored smoking cessation booklet. The control group was also offered the number to the local quit line. In addition, to ensure participants in the control group received at least the “recommended counseling” each enrollment call concluded with the American College of Obstetricians and Gynecologists (ACOG) recommended smoking cessation counseling. The ACOG recommended counseling lasted about 5 minutes for each control participant.

The control and intervention groups were similar in almost every category. There were over 20 categories, everything from age to depressive symptoms, cigarettes per day, and health insurance. This limited the significant differences that could have altered the study.

Every counselor in the study had a master's or bachelor's degree. These counselors were required to tape record one week of interviews each month. Impartial parties assessed these interviews to be sure the groups were receiving the required level of counseling.

The results of this study showed that 21% of the intervention group quit and 16% of the control group quit. The difference was not significant enough for the study to conclude that telephone counseling is superior to the control. One significant conclusion to this study was that telephone counseling proved to be effective for nearly two thirds of light smokers in the sample group. Light smokers were categorized as smoking less than 10 cigarettes per day.

The telephone study had some drawbacks. Smoking cessation was verified by salivary cotinine levels at the end of pregnancy. The study's participants had to mail in their saliva; however, only 67% of participants did so. The persons who did not mail their saliva were counted as smokers. This could have led to a higher reported number of smokers. Also, the study included 442 smokers, however, the actual number of smokers in the clinics was higher because about 34% refused to participate in the study and 50% were ineligible. Although these persons were not included in the study, it still limits the study since the results cannot be generalized to all pregnant smokers.

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Another drawback was that the control group members who wanted extra help could have called the number for a local quit line. The number of participants who called the quit line and how long they were counseled for, was not tracked in this study. This may have affected results in that the patients who called may have actually received more counseling than was recorded. One other thing that could have altered the results was that instead of using routine practice, which most pregnant women receive, they used “best practice” as control. Best practice is exactly what is recommended by the ACOG and likely exceeds the usual clinical care. If routine practices were used, telephone counseling would have probably proved to be more effective.

### **STUDY #2**

The second study was called “Randomized Controlled Trial of Home Based Motivational Interviews by Midwives to Help Pregnant Smokers Quit or Cut Down.” This trial was completed by Tappin DM, et al., and was published in August of 2005 by the British Medical Journal.<sup>9</sup> The study was a non-blinded trial analyzed by intent to treat.

This study included pregnant women who were regular smokers and presented to one of two hospitals in Glasgow, Scotland for routine prenatal care. The women were randomized into two groups according to how many cigarettes they smoked per day. Smokers were divided into three groups based on the amount they smoked: less than ten cigarettes per day, ten to twenty, and greater than twenty. The control and experimental groups were matched for the three different amounts of cigarettes per day.

Compliance data was collected by way of midwives taping counseling sessions. An unbiased group at the Center for Alcoholism, Substance Abuse and Addictions at the University of New Mexico assessed the interviews for proficiency. This group found that nearly all interviews were proficient and two-thirds were expert level according to the Motivational Interviewing Skills Code (MISC), which is used to assess the effectiveness of motivational counseling.

The study included 762 out of 1684 pregnant smokers in the Glasgow area. In order to be included in the study women had to be smokers at their initial visit and be less than twenty-four weeks gestation. The median age of gestation was 13 weeks.

The outcome measured was self-reported smoking cessation verified by plasma or salivary cotinine concentrations. These

plasma or saliva samples were collected and tested throughout pregnancy at prenatal visits.

In this study, data was also collected on adverse events, including antenatal admissions, miscarriage, termination of pregnancy, preterm delivery (< 37 weeks' gestation), very low birth weight (< 1500 g), neonatal death, assisted delivery (forceps or caesarean section), and admission to the neonatal unit.

All women received standard health promotion information and the intervention group was offered motivational interviewing at home. The intervention group received home visits by four dedicated nurse midwives who received 5 days of training before providing counseling. These midwives were required to record all interviews to be reviewed and assessed for adequacy. Each intervention group member received an average total of 56 minutes of counseling. The control received the standard health promotion information only.

The results were 4.8% of women in the intervention group had self-reported and cotinine verified cessation compared to the control group, which had 4.6%. The difference between the control and the intervention was not statistically significant. This proves that home based motivational counseling is just as effective as standard health promotion information.

The size of the study population was adequate; however, only 45% of pregnant smokers in the two hospitals studied actually joined the study. Therefore, this study cannot be generalized to all pregnant smokers in this area. Another drawback to the study is that the midwives and the participants knew which group they were in and this could have affected the results. A person blinded to both groups, however, analyzed the primary outcome data (quit, cut down, same, more). Also, the control and experimental groups were not matched for anything other than amount of cigarettes they smoked. The authors suggest that lack of similarities created a wide confidence interval and in turn suggests that because of this, other significant differences may be present.

Pregnant women who quit before the booking interview were not included in the study. The authors state this as a drawback to their study, citing that this meant their study included heavier, more dependant smokers, who could not quit via their own motivation.

## CONCLUSION

These studies failed to show a statistically effective method of smoking cessation in pregnancy. These studies found that telephone counseling and motivational counseling were not more effective for smoking cessation in pregnancy than brief, in office counseling. Therefore, it can be concluded that the interventional methods used did not significantly increase smoking cessation.

One interesting conclusion from the telephone counseling study is that telephone counseling is an effective method for light smokers and those who had tried to quit in the past. A repeat study including only this population should be done to verify that telephone counseling is an effective method to help light smokers quit.

Both studies verified smoking cessation with a cotinine level. One study used only salivary and the other used plasma or salivary. There is no proven difference in specificity or sensitivity that makes one method better than the other. The cotinine level in plasma and saliva can be affected by exposure to second-hand smoke and the use of a nicotine patch or other source of nicotine replacement<sup>1,4</sup>. This means that elevated cotinine levels in the participants is not necessarily accurate in verifying smoking cessation. Using this test could lead to smoking cessation being under-recorded. These variables were not accounted for in either of the above studies and may have slightly lowered the number of women counted as successful quitters.

These studies are the most up-to-date and their findings coincide with previous studies on the same topics. This

proves that these methods are not effective for the pregnant population. The continual lack of an effective method shows that we need studies to assess nicotine replacement and pharmacological methods in the pregnant population.

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