Provision and effect of quit-smoking counselling by primary care midwives

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ABSTRACT

Objective: we aimed to evaluate the provision of quit-smoking counselling by midwives in the Netherlands and its effect on smoking behaviour and birth weight.
Design: quasi-experimental study in which we collected information from pregnant women who smoke throughout their pregnancy by extracting data from electronic patient files.
Setting: primary care midwifery practices.
Participants: 851 pregnant women who smoke, treated between 2011 and 2014.
Intervention: quit-smoking counselling.
Measurements and findings: the midwives decided to provide quit-smoking counselling to the participant or not. Non-counselled women were used as the control group. The primary outcome parameter was quit smoking, defined as 'quit smoking by end of pregnancy'.

At intake, 67% of the women smoked 1–9 cigarettes a day, 23% smoked 10–20 cigarettes a day and 4% more than 20 cigarettes a day. The midwives began counselling with 42% of the participants, but seldom completed all the counselling steps. The average quit rate was 10% and average birth weight of the babies was 3200 g. We found no difference in quit rate or birth weight between counselled women and those who were not. However, the data suggested that counselling is more effective when more steps of counselling are completed.
Key conclusions: no effect was found of quit-smoking counselling on quit-smoking rate or birth weight. Possibly, counselling is effective when provided extensively throughout pregnancy.
Implications for practice: our study shows that provision of counselling can be improved.

Introduction

It is known that smoking during pregnancy is associated with a higher risk of fetal mortality and of adverse birth outcomes such as stillbirth, preterm birth, small for gestational age, intrauterine growth restriction, and congenital heart defects (Cnattingius, 2004; Leonardi-Bee et al., 2008; Roelands et al., 2009; U.S. Department of Health and Human Services, 2014; Yerushalmy, 2014). Nevertheless, 6% of women in the Netherlands smoke during pregnancy (Lanting et al., 2012). Among lower educated women, the prevalence of smoking during pregnancy is around 14% (Lanting et al., 2012). In the United States the smoking rate during pregnancy is around 10% (Centers for Disease Control and Prevention, 2014) and in the United Kingdom 12% (Health and Social Care Information Centre, 2014). Further reduction of smoking during pregnancy is of major importance for reducing perinatal mortality (Mohangoo et al., 2008).

Quit-smoking counselling during pregnancy has been shown to reduce numbers of smokers in late pregnancy, low-birthweight and preterm birth (Lumley et al., 2009). Nevertheless, the provision of counselling to pregnant women is often suboptimal (Price et al., 2006; Segaar, 2006; Sarna et al., 2009).

In the Netherlands, midwives play a central role in providing quit-smoking counselling for pregnant women who smoke, as they see 80% of all pregnant women at an early stage of pregnancy in their midwifery practices (Appendix 1). The counselling applies

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a minimal intervention strategy (V-MIS), based on the stages of change theory (Prochaska and DiClemente, 1983) and adapted for the midwifery care setting. V-MIS is effective in reducing smoking among pregnant women (de Vries et al., 2006). V-MIS comprises seven steps. In step 1, the midwife categorises the smoking behaviour of the woman and her partner. In step 2, the midwife tries to enhance the motivation to quit. In step 3, the midwife and woman discuss the barriers to successful quitting and how to mobilise social support. If the client is motivated to quit, they agree a quit date in step 4. In step 5, the midwife discusses additional self-help materials and gives them to the woman. In step 6, the midwife provides aftercare if required. In step 7, the midwife provides support to prevent relapse after delivery (de Vries et al., 2006).

A previous study on the implementation of V-MIS in midwifery practices found several differences between adherent users and non-adherent users (Segaar, 2006). Adherent users had significantly more knowledge about V-MIS, were more convinced of the importance of providing counselling, and were more likely to agree that counselling is a task of midwives. Adherent users had a more positive attitude towards the V-MIS and perceived less 'cons' than non-adherent users. Adherent users perceived more support from their social environment than non-adherent users. Finally, adherent users were more convinced that they had mastered the skills required to implement the V-MIS than non-adherent users (Segaar, 2006).

Multiple studies have addressed quit-smoking counselling of pregnant women who smoke (Lumley et al., 2009; Everett-Murphy et al., 2010; Filion et al., 2011; Naughton et al., 2012; Tappin, 2015). As the method of counselling is not the same across studies, also the effectiveness of the studied interventions is different. Furthermore, the reduction in smoking during pregnancy during the last decade might also have changed the population of pregnant women who smoke. The last time the effectiveness of V-MIS was studied, in a cluster randomised controlled trial (RCT) was more than 15 years ago (de Vries et al., 2006). Moreover, nothing is known about V-MIS implementation in clinical practice. As a result, it is uncertain whether this strategy is still effective.

Evidence for the provision and effectiveness of counselling would provide the opportunity to decrease numbers of pregnant women who smoke. Therefore we aimed to evaluate the provision of quit-smoking counselling by midwives and its effect on smoking behaviour and birth weight.

Methods

Study design and population

Our quasi-experimental study included pregnant women who smoke, registered in primary care midwifery practices who had smoked at least one cigarette after entering the practice between February 2011 and November 2013. The midwives decided to provide quit-smoking counselling to the participant or not. Non-counselled women were used as the control group.

The participants were under treatment between 12 and 30 weeks of gestation at least, for at least 8 weeks in total. Women were excluded if they had no intake date or consultations registered. Those without health insurance were also excluded, as coverage is obligatory in the Netherlands. Finally, those with HIV, hepatitis B or syphilis were excluded from the analysis.

The midwifery practices in our study all worked with the same patient registration system and used electronic patient records (EPR) to register quit-smoking counselling. Since all the practices did not start using EPR at the same time for registration of counselling, the inclusion of participants began on different dates for each practice.

Data collection

Throughout the pregnancy we collected data retrospectively from the EPR. All data was registered by midwives as part of normal care. We retrieved participant information only from the EPR, meaning we gathered no additional information about individuals through other channels. However, we did collect additional information on the practice through phone interviews with the midwife responsible for quit-smoking counselling.

Participating midwives received a small compensation in the form of a gift voucher for 25 Euros on completion of the entire study procedure. The ethics committee of x (Removed for double-blind peer review) waived ethical approval for this analysis. We obtained informed consent from all participating midwives.

Study variables and definitions

The primary outcome parameter was quit smoking, defined as 'quit smoking by the end of pregnancy', which was self-reported in the last consultation. Answer categories were 'non-smoking', 'smoking less than 10 cigarettes a day', 'smoking between 10 and 20 cigarettes a day' and 'smoking more than 20 cigarettes a day'. The secondary outcome parameter was birth weight of the child, taken directly after birth. The studied intervention was quit-smoking counselling, based on the various steps of V-MIS. To assess the effect of applying V-MIS more or less extensively, we used different cut-offs to define counselling as yes/no.

Most study variables were retrieved directly from the EPR and therefore definitions depended on the midwives who filled in the patient records. Other variables were defined according to information extracted from the EPR. Growth retardation was defined as a score below the 5th percentile in an ultrasound of head circumference, abdominal circumference or femur length. Gestational hypertension was defined as before 20 weeks normotensive and after 20 weeks diastolic blood pressure equal or greater than 90 mmHg, or systolic blood pressure equal or greater than 140 mmHg. Pre-eclampsia was defined as hypertension and presence of albumin in laboratory urine test. Infectious diseases were defined as present when the EPR recorded a positive lab test. Diabetes was defined as present when a diabetes lab test above the cut off level of that laboratory was recorded. The socio-economic status (SES) of the participants was based on the status of the participants' home neighbourhood. This score was obtained from a government agency (Netherlands Institute for Social Research) (Netherlands Institute for Social Research (Sociaal en Cultureel Planbureau)) and ranged from −10 to +10, where higher scores represent higher SES. Ethnicity was defined as Western when the woman was Dutch, European or other Western, and defined as non-Western when the woman was North African, other African, Turkish, South-Asian, East and South-East Asian, other Asian or other non-Western.

Statistical analysis

Characteristics of the clients and their pregnancy were described on the patient level. The provision of counselling was described on the practice level, to assess differences between practices. The effect of counselling on quit-smoking rate and birth weight was evaluated using hierarchical linear and logistic regression models with a random intercept for practices. Clustering of clients within practices is taken into account in hierarchical models (Verbeke and Molenberghs, 2009).

The dependent variables were quit smoking and birth weight. For the analysis of birth weight, we excluded women without partum. The independent variable was quit-smoking counselling (yes/no), defined using different cut-offs.