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The use of midwife-led primary antenatal care by obese women in The Netherlands: An explorative cohort study

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ABSTRACT

Objective: to study the effect of body mass index (BMI) on the use of antenatal care by women in midwife-led care.
Design: an explorative cohort study.
Setting: 11 Dutch midwife-led practices.
Participants: a cohort of 4421 women, registered in the Midwifery Case Registration System (VeCaS), who received antenatal care in midwife-led practices in the Netherlands and gave birth between October 2012 and October 2014.
Findings: the mean start of initiation of care was at 9.3 (SD 4.6) weeks of pregnancy. Multiple linear regression showed that with an increasing BMI initiation of care was significantly earlier but BMI only predicted 0.2% (R^2) of the variance in initiation of care. The mean number of face-to- face antenatal visits in midwife-led care was 11.8 (SD 3.8) and linear regression showed that with increasing BMI the number of antenatal visits increased. BMI predicted 0.1% of the variance in number of antenatal visits. The mean number of antenatal contacts by phone was 2.2 (SD 2.6). Multiple linear regression showed an increased number of contacts by phone for BMI categories 'underweight' and 'obese class I'. BMI categories predicted 1% of the variance in number of contacts by phone.
Key conclusions: BMI was not a relevant predictor of variance in initiation of care and number of antenatal visits. Obese pregnant women in midwife-led practices do not delay or avoid antenatal care.
Implications for practice: Taking care of pregnant women with a high BMI does not significantly add to the workload of primary care midwives. Further research is needed to more fully understand the primary maternal health services given to obese women.

Introduction

Maternal obesity during pregnancy and childbirth presents a significant challenge to maternal health services. Obesity is associated with an increase in adverse outcomes and interventions (Sebire et al., 2001; O'Brien et al., 2003; Usha Kiran et al., 2005; Chu et al., 2007a, 2007b, 2007c; Heslehurst et al., 2008; Stothard et al., 2009; Torloni et al., 2009a, 2009b; Flenady et al., 2011) creating demands for additional care and resources. To address the need for maternal health care of obese women it is important to be able to estimate the magnitude of the additional health care services required. Earlier studies have identified the relationship between obesity and increased use of in-hospital facilities such as obstetrical ultrasonography and more interventions including inductions of labor, instrumental and cesarean deliveries, longer hospital stays, antenatal fetal tests, and neonatal intensive care; all of which result in higher maternity costs

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(Galtier Dereure et al., 2000; Heslehurst et al., 2008; Chu et al., 2008; Trasande et al., 2009; Denison et al., 2014).

However, little is known about obese women's use of primary maternal care services: do they use more, less, or the same amount of primary care? In an earlier study we found that Dutch midwives are able to safely assign obese women who started in primary care to either midwife-led or obstetrician-led care, resulting in 62% of the obese women with a midwife-led pregnancy and 33% with a midwife-led pregnancy and childbirth (Daemers et al., 2014).This model of maternity care – providing primary care when possible and specialized care only when necessary – offers possibilities for cost reduction without losing quality of care.

Some studies suggest that obese women use *more* primary care than women with normal weight. Chu et al. (2008) registered a higher amount of medication dispensed from the outpatient pharmacy, more telephone calls and more antenatal visits with physicians for US pregnant women with BMI ≥35 without high-risk conditions. Denison et al. (2009) found an increase in minor complications and complaints such as symphysis pubis dysfunction, heartburn, and chest infection in pregnant women with BMI ≥30 in the UK. In a qualitative study on the impact of obesity on UK maternity services, midwives reported increased use of glucose tolerance tests, ultrasounds to determine fetal size and presentation, and more referrals to dieticians and to physiotherapists for their obese patients (Heslehurst et al., 2007).

On the other hand, obese women may be reluctant to access services and thus use *less* care. The qualitative study of UK primary health care users by Brown et al. revealed that obese patients' feelings about their personal responsibility, their sense of stigma, and their expectation of negative stereotypes seemed to interact with their use of primary care services: a lack of services tailored to obese women and negative communication affected access to care and good experiences with primary care professionals only partly ameliorated the effects of stigma cognitions (Brown et al., 2006). We also know that obese white women participate less frequently in breast and cervical cancer screening (Wee et al., 2004; Wee et al., 2005; Ostbye et al., 2005; Bussiere et al., 2014). As far as we know, no studies in maternal care revealed this effect.

To further complicate this picture, there are studies that show that obese women use maternity care services at the same rate as non-obese women. Levine et al. (2013) found no difference in the initiation of care in the first trimester, in total number of antenatal visits or in adequacy of antenatal care between pregnant women with and without obesity in the United States. Satisfaction with medical and emotional aspects of maternity care in general and overall satisfaction of antenatal (midwifery) care did not differ between obese and non-obese pregnant women in Sweden (Hildingsson and Thomas, 2012). In a Dutch study on determinants of antenatal healthcare utilization by women in primary midwife-led care BMI ≥30 did not predict inadequate use of antenatal care (Feijen-de Jong et al., 2015).

In conclusion, the few studies carried out on the use of primary maternal care services by obese women showed contradictory results. The goal of our study of 11 midwife-led primary care practices across The Netherlands was to determine the effect of body mass index (BMI) on the use of antenatal care in a midwife-led care population.

Methods

Study population and data collection

An explorative cohort study was conducted based on data from the Midwifery Case Registration System (Verloskundig Casusregistratie Systeem, VeCaS). This Dutch database initiated by the Research Centre for Midwifery Science Maastricht – (Zuyd University) continuously extracts digital obstetrical files from 25 Dutch midwife-led practices (Wijnen et al., 2013; Zeegers et al., 2015). Midwives who cooperate in the VeCaS project register their care using their own electronic patient record system (EPRS). Two different EPRS are used by the midwife practices participating in VeCaS: Vrumun and Orfeus. To optimize validity and completeness of the data a Consensus Manual for Data Registration was constructed as a guide for midwives' registrations and midwives participated in activities such as consensus meetings and feedback sessions (Bastiaans and Wijnen, 2013). When the midwifery practice participates in the VeCaS project, all women are asked for permission to use their anonymized records with 1–3 refusals per practice per year. We used data gathered between October 2012 and October 2014 of pregnant women registered using the Orfeus system because of the completeness of the required data for our study. In this study period the Orfeus system represented 11 practices which were spread across the Netherlands and differed on degree of urbanization, size of practice and number of practising midwives. We included all pregnant women who consented, received antenatal care, and gave birth in the period of the data collection. We excluded women who were not eligible for primary care and were referred to secondary care immediately after their booking and women with missing data on prepregnancy BMI. Prepregnancy BMI was calculated as weight before pregnancy (kg) divided by squared height (m^2). Weight was self-reported by the pregnant women, height was measured by the midwives. We classified BMI according to the WHO- classification (WHO, 2000). The VeCaS project was approved by the regional Medical Research Ethics Committee Maastricht (nr 09-4-061) and is admitted in the public register of the Dutch Data Protection Authority (nr 1489634).

Outcome measures

To assess the use of primary maternal care services, we considered two main outcomes: the initiation of antenatal care and the total number of antenatal visits in primary care. We recorded the total number of antenatal consultations and the number of antenatal contacts by phone as secondary outcomes. We defined initiation of antenatal care as the moment (in weeks of pregnancy) of first contact with the midwife-led practice, in person or by phone. We considered a antenatal consultation as any antenatal contact between the midwife and the pregnant woman in person or by phone. We defined an antenatal visit as a face-to-face contact between midwife and woman.

Statistical analyses

To test the association between BMI and the initiation of antenatal care, the number of antenatal visits, and the number of contacts by phone we performed separate fixed effects multiple linear regression analyses with a stepwise backward predictor selection strategy (Field, 2009). BMI as a continuous variable, age, parity and SES (dummies) were included in the model for initiation of antenatal care. We used an algorithm made by the Netherlands Institute for Social Research as a proxy for socio-economic status (SES), allowing us to correct for this variable (SCP, 2009). Categories of SES were based on this algorithm. The regression model on the number of antenatal visits included BMI as a continuous variable, age, parity, SES, referral to secondary care during pregnancy, initiation of care and duration of antenatal care. We also included the interaction between initiation and duration of antenatal care because the number of visits intensifies towards the end of the pregnancy. Thus the association between duration of antenatal care and the number of visits might differ depending on initiation of care early in pregnancy versus later in pregnancy. Since the mean number of visits distributed over the BMI categories could show a U-shaped relation, we performed a multiple linear regression including BMI categories and found no significant effect of the underweight category. This allowed us to integrate BMI as a continuous variable in the regression models of initiation of care and number of antenatal visits. The regression model on the number of contacts by