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Erratum

Change in primary midwife-led care in the Netherlands in 2000–2008: A descriptive study of caesarean sections and other interventions among 807,437 low risk births

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ABSTRACT

Objective: to study whether an increase in intrapartum referrals in primary midwife-led care births in the Netherlands is accompanied by an increase in caesarean sections.
Design: nationwide descriptive study.
Setting: The Netherlands Perinatal Registry.
Participants: 807,437 births of nine year cohorts of women with low risk pregnancies in primary midwife-led care at the onset of labour between 2000 and 2008.
Measurements: primary outcome is the caesarean section rate. Vaginal instrumental childbirth, augmentation with oxytocin, and pharmacological pain relief are secondary outcomes. Trends in outcomes are described. We used logistic regression to explore whether changes in the planned place of birth and other maternal characteristics were associated with the caesarean section rate.
Findings: the caesarean section rate increased from 6.2 to 8.3 per cent for nulliparous and from 0.8 to 1.1 per cent for multiparous women. After controlling for maternal characteristics the year by year increase in the caesarean section rate was still significant for nulliparous women (adj OR 1.03; 95% CI 1.02–1.03). The vaginal instrumental birth declined from 18.2 to 17.4 per cent for nulliparous women (multiparous women: 1.7–1.5 per cent). Augmentation of labour and/or pharmacological pain relief increased from 23.1 to 38.1 per cent for nulliparous women and from 5.4 to 9.6 per cent for multiparous women.
Conclusion: the rise in augmentation of labour, pharmacological pain relief and electronic fetal monitoring in the period 2000–2008 among women in primary midwife-led care was accompanied by an increase in caesarean section rate for nulliparous women. The vaginal instrumental deliveries declined for both nulliparous and multiparous women.
Implications for practice: primary care midwives should evaluate whether they can strengthen the opportunities for nulliparous women to achieve a physiological birth, without augmentation or pharmacological pain relief. If such interventions are considered necessary to achieve a spontaneous vaginal birth, the current disadvantage of discontinuity of care should be reduced. In a more integrated care system, women could receive continuous care and support from their own primary care midwife, as long as only supportive interventions are needed.

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Introduction

Internationally there is concern about the rising caesarean section (CS) rate in high income countries since the 1970s. In 1985, the World Health Organisation (WHO) assessed a CS rate of 10–15 per cent as justifiable (WHO, 1985). Caesarean sections are associated with serious maternal morbidity and mortality when compared to vaginal births (Zwart et al., 2008; Gregory et al., 2012). It has been suggested that CS rates of more than 15 per cent may lead to increased risks for reproductive health outcomes that outweigh benefits (Betran et al., 2007). However, most high income countries nowadays have CS rates that are much higher than the WHO recommendation (Betran et al., 2007). Although in the Netherlands the CS rate has also risen substantially since the 1980s, it has not risen above 15 per cent until now (Elferink-Stinkens et al., 1995; Kwee et al., 2007; EURO-PERISTAT, 2013; Stichting Perinatale Registratie Nederland, 2011b).

An important factor contributing to this relatively low CS rate is the maternity care model in the Netherlands (Bais et al., 2001; Kwee et al., 2007; Christiaens et al., 2013). Non-medicalised childbirth is organised in primary care for healthy women with low risk pregnancies. Secondary obstetrician-led care is mainly provided for complicated pregnancies and births. Healthy women with an uncomplicated pregnancy usually receive care from independent primary care midwives in the community. When problems arise during pregnancy, a referral to the obstetrician-led team in secondary care takes place. As a result of this risk selection process, women who are in primary midwife-led care at the onset of labour can be considered as low risk. They may choose home birth or planned hospital birth accompanied by their own midwife. Regardless of the chosen birth location, obstetrical interventions such as pharmacological pain relief, continuous fetal monitoring, augmentation of labour and instrumental birth are available to them, but only after an intrapartum referral to obstetrician-led care in the hospital. During the past decade, more than half of all pregnant women in the Netherlands were in primary midwife-led care at the onset of labour (Stichting Perinatale Registratie Nederland, 2011a).

In this maternity care model caesarean sections are less common for women who start labour in primary midwife-led care compared to women with a comparable risk profile who are in secondary obstetrician led-care at the start of labour (Berghs et al., 1995; Maassen et al., 2008). In 2003 the overall CS rate for low risk women was 5.0 per cent. For women who started labour in primary midwife-led care this was 3.4 per cent, and 12.2 per cent among those that started in obstetrician-led care (OR 3.97, CI 3.15–5.01) (Maassen et al., 2008).

In recent observational studies in other developed countries, midwife-led care for low risk women is also associated with low CS rates (Janssen et al., 2009; Birthplace in England Collaborative Group, 2011). The lowest CS rate in these studies was found in planned home births. In a systematic review of randomised controlled trials, midwife-led care was not associated with lower CS rates in comparison with other models of care (Sandall et al., 2009). Other obstetric interventions such as pain relief and augmentation of labour were less common in midwife-led care models than in other models. Birth locations other than the conventional hospital labour ward are also associated with lower intervention rates.

However, primary midwife-led care in the Netherlands is changing. The referral rate from primary midwife-led care to obstetrician-led care is rising, both during pregnancy and during labour. Since the start of the national registration of primary midwife-led care on a national basis in 1988, the percentage of women cared for in primary midwife-led care who were referred to obstetrician-led care at some point during pregnancy or labour increased substantially: from 37 per cent in 1988 to 51 per cent in 2004 (Amelink-Verburg et al., 2009). In 2007 less than half of all women only received primary midwife-led care (Wiegers, 2009). In the same time period the home birth rate declined from more than 38 per cent in 1990 to less than 24 per cent in 2008 among all 180,000–200,000 births in the Netherlands (Houben-van Herten, 2011).

As both obstetrician-led care and planned hospital birth are associated with higher intervention rates, these changes might lead to an increasing CS rate for women in primary midwife-led care at the onset of labour. Considering the international concern about rising CS rates, it is important to find out whether the rise in referrals leads to a higher CS rate.

Therefore we investigated whether these changes in primary midwife-led care are accompanied by a rise in CS rate among women in primary midwife-led care at the onset of labour.

Methods

In the Netherlands data on pregnancy, birth and neonatal care are available in a national database, the Netherlands Perinatal Registry (PRN). These data are routinely collected by midwives, general practitioners active in primary maternity care, obstetricians and neonatologists in separate professional registries and combined via a validated linkage method (Meray et al., 2007; Tromp et al., 2008). The PRN contains approximately 95 per cent of all births in the Netherlands (Stichting Perinatale Registratie Nederland, 2011b). For our study, data were available for the years 2000–2008. We analysed 1,650,802 records. Births of women who were in primary midwife-led care at the onset of labour and who were therefore considered low risk were included. Births of women who were in obstetrician-led care at the onset of labour were excluded, for example women with a prior caesarean section. We excluded cases of fetal death before the onset of labour. In total 807,437 births of women in primary midwife-led care, with a low risk pregnancy and a live fetus at the onset of labour were included. The inclusion is described in the flow chart in Fig. 1.

Outcome measures and other variables

Primary outcome is the intrapartum caesarean section rate. Vaginal instrumental (vacuum or forceps) birth, pharmacological sedation or analgesia, epidural anaesthesia, and augmentation of labour with oxytocin are secondary outcomes.

Intrapartum referrals are categorised in this study as non-urgent during first stage of labour, non-urgent during second stage of labour, or urgent intrapartum referral. The level of urgency is based on the reason for referral as coded by the attending midwife. This categorisation in urgency levels was defined by Amelink-Verburg et al. (2008). Referrals for fetal distress, suspected placental problems, or other complications that require immediate investigation or treatment at the secondary care level are coded as urgent. Other intrapartum referrals for reasons such as failure to progress, need for pain relief, or meconium stained liquor, are coded as non-urgent. Referrals during the third stage of labour or directly post partum are coded as ‘no intrapartum referral’ as these referrals have no impact on interventions during labour or the mode of birth.

Antenatally planned place of birth (home, hospital primary care) and actual place of birth (home, hospital primary midwife-led care, hospital obstetrician-led care) are recorded by the primary care midwife (de Jonge et al., 2009). If the planned place of birth was missing, we recoded this as ‘unknown’. Maternal age, parity, and ethnic background are possibly related with the planned birth location or intrapartum referral (Anthony et al., 2005) and are