



Intrapartum and neonatal mortality in primary midwife-led and secondary obstetrician-led care in the Amsterdam region of the Netherlands: A retrospective cohort study

M.M.J. Wiegerinck, MD, MSc (Registrar Obstetrics and Gynaecology, PhD student)^{a,*}, B.Y. van der Goes, MSc (Midwife)^a, A.C.J. Ravelli, PhD (Epidemiologist, Assistant Professor)^{b,c}, J.A.M. van der Post, MD, PhD (Professor)^a, J. Klinkert, RM, MPH (Midwife)^d, J. Brandenbarg, RM, LLM, MSc (Midwife)^e, F.C.D. Buist, RM, MBA (Midwife)^f, M.G.A.J. Wouters, MD, PhD (Gynaecologist)^f, P. Tamminga, MD (Neonatologist)^g, A. de Jonge, RM, PhD (Midwife)^h, B.W. Mol, MD, PhD (Professor)ⁱ

^a Academic Medical Center, Department of Obstetrics and Gynaecology, Meibergdreef 9, 1105 AZ Amsterdam, The Netherlands

^b Academic Medical Center, Department of Medical Informatics, 1100 DE Amsterdam, The Netherlands

^c Academic Medical Center, Department of Obstetrics, PO Box 22700, 1100 DE Amsterdam, The Netherlands

^d Midwives in Primary care Amsterdam and Amstelland (EVAA), Rijtuigenhof 105, 1054 NC Amsterdam, The Netherlands

^e Practice for Obstetrics, Dietetics and Coaching, Margaretha van Borsselelaan 39, 1181 CZ, Amstelveen, The Netherlands

^f VU University Medical Center, Department of Obstetrics and Gynaecology, PO Box 7057, 1007 MB, Amsterdam, The Netherlands

^g Emma Children's Hospital AMC, Neonatal Intensive Care, Meibergdreef 9, 1105 AZ Amsterdam, The Netherlands

^h AVAG/ EMGO+, VU University Medical Center, Department of Midwifery Science, Van der Boechorststraat 7, 1081 BT Amsterdam, The Netherlands

ⁱ The Robinson Institute, School of Paediatrics and Reproductive Health, University of Adelaide, K William Street 72, 5000SA Adelaide, Australia

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ABSTRACT

Objective: to compare intrapartum- and neonatal mortality and intervention rates in term women starting labour in primary midwife-led versus secondary obstetrician-led care.

Design: retrospective cohort study.

Setting: Amsterdam region of the Netherlands.

Participants: women with singleton pregnancies who gave birth beyond 37+0 weeks gestation in the years 2005 up to 2008 and lived in the catchment area of the neonatal intensive care units of both academic hospitals in Amsterdam. Women with a primary caesarean section or a pregnancy complicated by antepartum death or major congenital anomalies were excluded. For women in the midwife-led care group, a home or hospital birth could be planned.

Measurements: analysis of linked data from the national perinatal register, and hospital- and midwifery record data. We assessed (unadjusted) relative risks with confidence intervals. Main outcome measures were incidences of intrapartum and neonatal (< 28 days) mortality. Secondary outcomes included incidences of caesarean section and vaginal instrumental delivery.

Findings: 53,123 women started labour in primary care and 30,166 women in secondary care. Intrapartum and neonatal mortality rates were 37/53,123 (0.70‰) in the primary care group and 24/30,166 (0.80‰) in the secondary care group (relative risk 0.88; 95% CI 0.52–1.46). Women in the primary care group were less likely to deliver by secondary caesarean section (5% versus 16%; RR 0.31; 95% CI 0.30–0.32) or by instrumental delivery (10% versus 13%; RR 0.76; 95% CI 0.73–0.79).

Key conclusions: we found a low absolute risk of intrapartum and neonatal mortality, with a comparable risk for women who started labour in primary versus secondary care. The intervention rate was significantly lower in women who started labour in primary care.

Abbreviations: CI, confidence interval; NICU, neonatal intensive care; PCG, Perinatal Co-operation Group; PRN, National Perinatal Register (Netherlands); RR, relative risk

* Corresponding author.

E-mail addresses: m.m.wiegerinck@amc.uva.nl (M.M.J. Wiegerinck), b.y.vandergoes@amc.uva.nl (B.Y. van der Goes), a.c.ravelli@amc.uva.nl (A.C.J. Ravelli), j.a.vanderpost@amc.uva.nl (J.A.M. van der Post), jokeklinkert@gmail.com (J. Klinkert), jokebrandenbarg@xs4all.nl (J. Brandenbarg), fcd.buist@vumc.nl (F.C.D. Buist), mga.wouters@vumc.nl (M.G.A.J. Wouters), p.tamminga@amc.uva.nl (P. Tamminga), ank.dejonge@vumc.nl (A. de Jonge), b.w.mol@amc.uva.nl (B.W. Mol).

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Implications for practice: these findings suggest that it is possible to identify a group of women at low risk of complications that can start labour in primary care and have low rates of medical interventions whereas perinatal mortality is low.

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Introduction

Safety of place of birth in term pregnancies has been subject of international debate. Dutch studies have found a comparable risk of perinatal mortality among low risk planned home versus planned hospital births (de Jonge et al., 2009; van der Kooy et al., 2011; de Jonge et al., 2015). Studies in Canada, North America and Britain showed similar results and moreover a lower intervention rate in the home birth group (Johnson and Daviss, 2005; Janssen et al., 2009; Birthplace in England Collaborative Group, 2011). However, these studies did not research whether women who start labour in primary care, regardless of their planned place of birth, have higher perinatal mortality risks than women who start labour in secondary care.

Obstetric care in the Netherlands is characterised by a formal distinction between primary care (led by midwives or general practitioners) and secondary care (led by obstetricians). Pregnant women who are considered low risk are usually looked after in primary care, although they can choose to be in secondary care. When complications or risk factors occur either during pregnancy or labour, women are referred to secondary care.

In 2010, a Dutch cohort study performed in the Utrecht region among women who gave birth after 37 weeks gestation to children without congenital abnormalities showed a significantly higher birth related perinatal mortality rate among women starting labour in primary midwife-led versus secondary obstetrician-led care (1.4‰ versus 0.6‰ respectively, (unadjusted) RR 2.3; 95% confidence interval (CI) 1.1–4.8) (Evers et al., 2010). It was unexpected that the population at highest risk (secondary care group) had a lower perinatal mortality rate in this cohort study (Evers et al., 2010) and additional research was recommended. To our knowledge, the study of Evers et al. was the first comparing pregnancy outcomes for women starting labour in primary versus secondary care in the Netherlands. However, concerns have been raised about its methodology (de Jonge et al., 2010). First, the numerator and denominator were not taken from the same geographical region. Second, the study has not clearly distinguished ante- or intrapartum perinatal death, which is (sometimes) difficult but important when conducting a study on birth related perinatal mortality. Third, registration inaccuracies in the definition of 'level of care at the onset of labour' in the national database were not taken into account.

We aimed to conduct a study in a comparable Dutch region with a similar design, taking the points of criticism into account. The study was conducted in the Amsterdam region, where 19% of all women in the Netherlands give birth. Over a three year period, we compared intrapartum and neonatal mortality and intervention rates among women who started labour in primary midwife-led versus secondary obstetrician-led care.

Methods

We performed a retrospective cohort study with use of linked data from the national perinatal register (PRN), together with additionally retrieved data from hospitals and midwife practices. The PRN database is a national database in which births of approximately 96% of primary care midwifery practices (national perinatal database-1 form) and of 99% secondary care units are

registered (national perinatal database-2 form) (Méry et al., 2007). 'It contains population based information on all pregnancies, births from 22 weeks onwards and (re)admissions occurring until 28 days after childbirth. This includes reason for referral to secondary care, medical indication, birth characteristics, complications, neonatal outcome and many other variables.'

We studied women with singleton pregnancies who gave birth beyond 37+0 weeks gestation and excluded women with a pre-planned caesarean section and women with a pregnancy complicated by congenital anomalies or antepartum fetal death. Congenital anomalies were considered to be present if antenatal testing had demonstrated a significant chromosomal anomaly, if multiple anomalies were established at physical examination suggesting an underlying syndrome, or if an underlying syndrome was documented in the autopsy report. Level of care distinguished primary care (led by midwives or general practitioners) and secondary care (led by obstetricians). Women in tertiary care were included in the secondary care group. Groups were constituted by level of care at the onset of labour. Women who were transferred to secondary care during labour were analysed in the primary care group, thus mimicking an intention-to-treat approach. All women were included regardless of their risk profile. Antepartum death was defined as intrauterine death before the onset of labour. We defined start of labour as having uterine contractions every five minutes for at least one hour, or ruptured membranes, or dilatation of the cervix of 3 cm or more.

From the PRN database, we selected data from all women who gave birth at term between 2005 and 2008 in 'the perinatal region of Amsterdam' (women's zipcode between 1000 and 2159, 8200 to 8245 and 8300 to 8324). This is one of the nine perinatal health care regions in the Netherlands that have neonatal intensive care (NICU) facilities. It consists of 18 hospitals with obstetric/paediatric care facilities, which form Perinatal Co-operation Groups (PCG's) with their surrounding community practices of independent midwives and general practitioners (Eskes et al., 2014). The study was limited to women with a home postal code within the perinatal health care region of Amsterdam regardless whether they gave birth within the study region or in another postal code region. Women who lived outside the catchment area of Amsterdam, but who gave birth within this area (irrespective of the birth outcome), were not included in the study.

Identification of perinatal deaths

The selection of cases of perinatal mortality was limited to women who were registered in the cohort defined above. First, we selected all perinatal deaths that were registered in the PRN. In addition, all 18 hospitals (both obstetric and neonatal departments) in the region were requested to supply data about their perinatal deaths at term in the study period. The retrieved supplementary data were added to the cases identified in the PRN. Also, cases classified in the PRN as antenatal stillbirth, congenital anomalies or multiple pregnancy, although not subject of this study, were audited for eligibility to double-check the classification from the PRN and the annual reports.

Patient records were retrieved from the hospitals and midwifery practices, and were examined by an expert panel for detailed classification.

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