UNIVERSITY OF AMSTERDAM

UvA-DARE (Digital Academic Repository)

Improving perinatal outcome: towards individualized care

Kazemier, B.M.

Publication date
2015
Document Version
Final published version

Link to publication

Citation for published version (APA):
Kazemier, B. M. (2015). *Improving perinatal outcome: towards individualized care*. [Thesis, fully internal, Universiteit van Amsterdam].

General rights
It is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), other than for strictly personal, individual use, unless the work is under an open content license (like Creative Commons).

Disclaimer/Complaints regulations
If you believe that digital publication of certain material infringes any of your rights or (privacy) interests, please let the Library know, stating your reasons. In case of a legitimate complaint, the Library will make the material inaccessible and/or remove it from the website. Please Ask the Library: https://uba.uva.nl/en/contact, or a letter to: Library of the University of Amsterdam, Secretariat, P.O. Box 19185, 1000 GD Amsterdam, The Netherlands. You will be contacted as soon as possible.

UvA-DARE is a service provided by the library of the University of Amsterdam (https://dare.uva.nl)

Download date:17 Nov 2026

CHAPTER 1

General introduction

GENERAL INTRODUCTION

Unfortunately not all pregnancies and deliveries take place without complications. Complications during pregnancy or delivery can lead to maternal morbidity and poor perinatal outcomes such as perinatal mortality or (severe) neonatal morbidity.

During pregnancy, most women receive regular check-ups from either a midwife or a gynaecologist. These check-ups are used to prepare them for birth and being a parent, promote healthy behaviour, prevent and detect infections or congenital anomalies and complications of pregnancy itself and manage pre-existing conditions that can worsen during pregnancy. The goal of antenatal care is therefore to get woman and her baby from start of pregnancy till birth and puerperium with the least morbidity and mortality. In addition, antenatal care is known to reduce the risk of perinatal mortality[1].

There are large differences in perinatal outcomes worldwide, even within developed countries. The EURO-PERISTAT compares numbers on foetal and neonatal mortality. They ranked the Netherlands as one of the highest countries among Europe when it comes to perinatal mortality[2]. In the Netherlands; 85% of perinatal deaths are associated with one of the Big 4 determinants: preterm birth, small for gestational age, congenital abnormalities and/or low Apgar score[3].

First assessment in antenatal care is to distinguish women who require standard care from those requiring special attention. For instance, most women with a previous preterm birth receive the first part of their antenatal care in a hospital instead of a midwifery practice. Although women with a previous preterm birth are at increased risk, not all women with a previous preterm birth will deliver preterm a second time. We can make some global risk assessments but are not able to give a women a risk assessment that is especially for her. Our assessments are based on group observations instead of individualized assessments. At the moment, we can only tell a woman what the chance of a second preterm delivery is for all women with a previous preterm birth, not her specific risk in this pregnancy. For instance, foetal characteristics and pregnancy specific/environmental factors are often not incorporated in the risk assessment these days, even though they play a role. If we can predict more precisely who is at risk (for preterm birth or any other pregnancy complication) preventive strategies can be used to decrease complications and improving poor perinatal outcomes.

This thesis will focus on preterm birth, small for gestational age, asymptomatic bacteriuria (ASB) and management of pregnancies in the term period to improve perinatal outcome.

Preterm birth

Preterm birth is defined as birth occurring prior to 37 weeks of gestation and is one of the largest obstetric problems. In 2010, an estimated 14.9 million babies were born preterm, which was 11% of all live births worldwide[4]. Preterm birth can be subdivided in different subgroups depending on the severity of preterm birth. Extremely preterm births are births before 28 weeks of gestation, very preterm are births between 28 to 32 weeks and moderate to late preterm births are births between 32 and 37 weeks.

The neonatal consequences of preterm birth depend on the severity; the earlier the birth, the bigger the consequences. Annually, preterm birth is responsible for the death of 1.1 million neonates worldwide[5]. In addition, many health and social problems can be attributed to preterm deliveries; 70% of neonates born before 25 weeks who survive, will have long-term neurologic or developmental disabilities[6]. Infants born late preterm are also at increased risk of cerebral palsy, respiratory problems, visual disorders, developmental delay and chronic diseases in adulthood[7-11].

Preterm birth can either start with premature contractions (45-50%), or with preterm pre-labour rupture of membranes (PPROM, 30%) or can be medically induced (15–20%)[12], also called iatrogenic preterm birth.

In the Netherlands, the risk of preterm birth in singleton pregnancies is around 6%[13]. The exact cause and mechanism of spontaneous preterm birth is in most cases unknown. Despite years of research and experience, we are still unable to identify all women at risk of spontaneous preterm birth. Although some women can be identified by known risk factors as a previous preterm birth, a large remainder of preterm births occur in women without any of the known risk factors. This emphasizes how little we know about the whole cascade involved in spontaneous preterm birth.

Asymptomatic bacteriuria

Asymptomatic bacteriuria (ASB) is the presence of a certain amount of bacteria in urine without the symptoms of a urinary tract infection. ASB is present in 2-10% of pregnant women [14]. It is associated with an increased risk of pyelonephritis during pregnancy, low birthweight and possibly preterm birth[15]. Studies concerning ASB in pregnancy are outdated, most of them performed in the 70ies and 80ies, even before introduction of ultrasound for pregnancy dating. In addition, most existing studies are of low quality. Despite this low grade evidence, most countries routinely screen and treat all women for ASB in pregnancy. In the Netherlands no routine screening and treatment is currently performed for ASB. It is unknown what the prevalence and risk factors for ASB in the Netherlands are. In addition, it is unknown whether it is really necessary to screen all pregnant women for ASB or if we can identify a certain group that is at increased risk for ASB. Because the alleged complications of ASB can have serious consequences for maternal and perinatal outcomes, additional, good quality research is necessary.

Management of (near) term pregnancy

In near term women, the onset of delivery is determined by spontaneous start of labour, or by induction of labour based on medical decisions. It is unknown what the best moment of delivery is in the term period, in order to minimize maternal and neonatal complications. Currently there is not much insight in the diversity of the risks of perinatal mortality in the term period. Proper weighing of the risk of continuing pregnancy versus the risk of delivery is only done in one or two studies. In addition, incorporating certain maternal factors as ethnicity in the decision to continue pregnancy or to pursue labour are new concepts.

Objectives and outline of this thesis.
Obviously many different factors are related to poor perinatal outcomes. The objective of this thesis was to identify women at risk in order to improve perinatal outcomes. In order to do that we focused on three subjects with separate aims:

- study screening options for spontaneous preterm birth at different time points during pregnancy in order to identify risk factors and gain insight in pathophysiologic mechanisms
- investigate the association between asymptomatic bacteriuria and poor perinatal and maternal outcome to investigate the necessity of a screen and treat program in the Netherlands
- explore differences in perinatal mortality near term in certain subgroups in order to individualize management of these pregnancies.

REFERENCES

1. Ray AM, Salihu HM. The impact of maternal mortality interventions using traditional birth attendants and village midwives. J Obstet Gynaecol 2004; 24(1):5-11.
2. Zeitlin J, Mohangoo AD, Delnord M, Cuttini M. The second European Perinatal Health Report: documenting changes over 6 years in the health of mothers and babies in Europe. J Epidemiol Community Health 2013; 67(12):983-985.
3. Bonsel GJ, Steegers EA. [Differences in perinatal mortality between provinces: dependence on many factors]. Ned Tijdschr Geneeskd 2011; 155:A3112.
4. Blencowe H, Cousens S, Oestergaard MZ, Chou D, Moller AB, Narwal R et al. National, regional, and worldwide estimates of preterm birth rates in the year 2010 with time trends since 1990 for selected countries: a systematic analysis and implications. Lancet 2012; 379(9832):2162-2172.
5. Liu L, Johnson HL, Cousens S, Perin J, Scott S, Lawn JE et al. Global, regional, and national causes of child mortality: an updated systematic analysis for 2010 with time trends since 2000. Lancet 2012; 379(9832):2151-2161.
6. Marlow N, Wolke D, Bracewell MA, Samara M. Neurologic and developmental disability at six years of age after extremely preterm birth. N Engl J Med 2005; 352(1):9-19.
7. Engle WA, Kominiarek MA. Late preterm infants, early term infants, and timing of elective deliveries. Clin Perinatol 2008; 35(2):325-41, vi.
8. Petrini JR, Dias T, McCormick MC, Massolo ML, Green NS, Escobar GJ. Increased risk of adverse neurological development for late preterm infants. J Pediatr 2009; 154(2):169-176.
9. Ramachandrappa A, Jain L. Health issues of the late preterm infant. Pediatr Clin North Am 2009; 56(3):565-77, Table.
10. Barker DJ. The developmental origins of chronic adult disease. Acta Paediatr Suppl 2004; 93(446):26-33.
11. Goldenberg RL, Culhane JF, Iams JD, Romero R. Epidemiology and causes of preterm birth. Lancet 2008; 371(9606):75-84.
12. Beck S, Wojdyla D, Say L, Betran AP, Merialdi M, Requejo JH et al. The worldwide incidence of preterm birth: a systematic review of maternal mortality and morbidity. Bull World Health Organ 2010; 88(1):31-38.
13. Schaaf JM, Mol BW, Abu-Hanna A, Ravelli AC. Trends in preterm birth: singleton and multiple pregnancies in the Netherlands, 2000-2007. BJOG 2011; 118(10):1196-1204.
14. Nicolle LE, Bradley S, Colgan R, Rice JC, Schaeffer A, Hooton TM. Infectious Diseases Society of America guidelines for the diagnosis and treatment of asymptomatic bacteriuria in adults. Clin Infect Dis 2005; 40(5):643-654.
15. Smaill F. Antibiotics for asymptomatic bacteriuria in pregnancy. Cochrane Database Syst Rev 2000;(2):CD000490.