Midwifery 30 (2014) 919–925

Contents lists available at ScienceDirect

Midwifery

journal homepage: www.elsevier.com/midw

The role of depressive symptoms in the pathway of demographic and psychosocial risks to preterm birth and small for gestational age

Chantal Quispel, MSc (Researcher)[a,b,*], Meike Bangma, MD (Gynaecologist (in training))[b], Brenda M. Kazemier, MD (Gynaecologist (in training))[c], Eric A.P. Steegers, MD, PhD (Gynaecologist)[b], Witte J.G. Hoogendijk, MD, PhD (Psychiatrist)[a], Dimitri N.M. Papatsonis, MD, PhD (Gynaecologist)[d], K. Marieke Paarlberg, MD, PhD (Gynaecologist)[c], Mijke P. Lambregtse-Van Den Berg MD, PhD (Psychiatrist and Child- and Youth Psychiatrist)[a,e], Gouke J. Bonsel, MD, PhD, MPH (Epidemiologist, Senior Researcher)[b,f]

[a] Department of Psychiatry, Erasmus Medical Centre Rotterdam, Rotterdam, The Netherlands
[b] Department of Obstetrics and Gynaecology, Division of Obstetrics & Prenatal Medicine, Erasmus MC, University Medical Centre Rotterdam, Rotterdam, The Netherlands
[c] Department of Obstetrics and Gynaecology, Gelre Teaching Hospital, Apeldoorn, The Netherlands
[d] Department of Obstetrics and Gynaecology, Amphia Hospital, Breda, The Netherlands
[e] Department of Child and Adolescent Psychiatry, Erasmus Medical Centre Rotterdam, Rotterdam, The Netherlands
[f] Department of Public Health, Erasmus Medical Centre Rotterdam, Rotterdam, The Netherlands

ARTICLE INFO

Article history:
Received 31 October 2013
Received in revised form
24 January 2014
Accepted 10 March 2014

Keywords:
Pregnancy
Preterm birth
Depressive symptoms
Risk factor

ABSTRACT

Objective: depressive symptoms during pregnancy are associated with preterm birth (PTB) and small for gestational age (SGA). Depressive symptoms and PTB and SGA, however, share similar demographic and psychosocial risk factors. Therefore, we investigated whether depressive symptomatology is an independent risk factor, or a mediator in the pathway of demographic and psychosocial risks to PTB and SGA.
Design: multicentre follow-up study.
Participants and setting: pregnant women ($n=1013$) from midwifery practices, secondary hospitals and a tertiary hospital in three urban areas in the Netherlands.
Measurements: initial risk factors and depressive symptoms were assessed with the Mind2Care instrument, including Edinburgh Depression Scale (EDS) during early pregnancy. Pregnancy outcomes were extracted from medical records. A formal mediation analysis was conducted to investigate the role of depressive symptoms in the pathway to PTB and SGA.
Findings: a univariate association between depressive symptoms and PTB (OR:1.04; 95% CI:1.00–1.08) was observed. After adjusting for the risk factors educational level and smoking in the mediation analysis, this association disappeared. One educational aspect remained associated: low education OR: 1.06; 95%–CI:1.02–1.10.
Key conclusions: depressive symptomatology appeared no mediator in the pathway of demographic and psychosocial risks to PTB or SGA. The presumed association between depressive symptoms and PTB seems spurious and may be explained by demographic and psychosocial risk factors.

* Correspondence to: Department of Psychiatry, Erasmus Medical Centre Rotterdam, University Medical Centre Rotterdam, Room Wk-221, PO Box 2040, 3000 CA Rotterdam, The Netherlands.
E-mail addresses: c.quispel@erasmusmc.nl (C. Quispel), m.bangma@erasmusmc.nl (M. Bangma), brendakazemier@gmail.com (B.M. Kazemier), e.a.p.steegers@erasmusmc.nl (E.A.P. Steegers), w.hoogendijk@erasmusm.nl (W.J.G. Hoogendijk), hoog.pap@wxs.nl (D.N.M. Papatsonis), kmpaarlb@xs4all.nl (K.M. Paarlberg), mijke.vandenberg@erasmusmc.nl (M.P. Lambregtse-Van Den Berg), g.bonsel@erasmusmc.nl (G.J. Bonsel).

http://dx.doi.org/10.1016/j.midw.2014.03.008

Implications for practice: for the prevention of PTB and SGA, interventions directed at demographic and psychosocial risk factors are likely to be of primary concern for clinicians and public health initiatives. As depressive symptoms and PTB and SGA share similar risk factors, both will profit.

Introduction

Adverse pregnancy outcomes, like preterm birth (PTB, < 37 weeks of gestation) and small for gestational age (SGA, < 10th percentile) have short and long-term consequences for both mother and child (Ashdown-Lambert, 2005; Gibson, 2007; Saigal and Doyle, 2008). As PTB and SGA are related to 80% of perinatal deaths, the prevention of PTB and SGA has become a key target (Bonsel et al., 2010; Howson et al., 2012; Liu et al., 2012).

Many risk factors have been associated with PTB and SGA, including a set of initial demographic and social risk factors, e.g. non-Western ethnicity, young maternal age (< 20 years), smoking and nulliparity (Blumenshine et al., 2010; Shah and Knowledge Synthesis Group on Determinants of LBW/PT Births, 2010; Black et al., 2012; Schaaf et al., 2013), and more specific risks such as depressive symptoms during pregnancy (Alder et al., 2007; Grote et al., 2010).

Depressive symptoms and the adverse pregnancy outcomes PTB and SGA share many initial demographic and social risks, as e.g. non-Western ethnicity, young maternal age, smoking and nulliparity also have been identified to be strong predictors for depressive symptoms during pregnancy (Lancaster et al., 2010).

This common explanatory background raises the question whether depressive symptoms increase the risk of PTB and SGA as an independent risk factor (covariate), or whether depression is part of the causal pathway from initial demographic and social risk factors (X) towards these adverse outcomes (Y).

Depressive symptoms cannot only interfere in this pathway as a mediator, but also as a confounder or moderator (effect modifier). We speak of a mediator if initial risk factors (X) cause depressive symptoms during pregnancy, and depressive symptoms consecutively lead to PTB and SGA (Y); we speak of a confounder if depressive symptoms cause both X and Y. We speak of a moderator if depressive symptoms alter the relation of X to Y at different levels of the variable of interest (Mackinnon et al., 2007). With a formal mediation analysis the explicit role of depressive symptoms can be tested.

The more depression acts as a true mediator, the more important is the screening for and treatment of depressive symptoms during pregnancy. If depressive symptoms, however, do not mediate the demographic and social pathway to PTB and SGA, it may be more efficient to screen for initial risk factors and to focus on relevant interventions in that regard, rather than to screen for depressive symptoms alone, if the primary goal is to prevent the associated adverse pregnancy outcomes. With a formal mediation analysis, the role of depressive symptoms in the pathway to PTB and SGA was tested in a multicentre follow-up study.

Methods

Data were generated using the Mind2Care screen-and-advice instrument (formerly known as GyPsy instrument) (Quispel et al., 2012), including the validated Edinburgh Depression Scale (EDS) (Bunevicius et al., 2009), demographical, obstetrical, social, and psychiatric risk factors including substance use, for adverse pregnancy outcomes. This instrument was developed by the Erasmus Medical Centre and the Rotterdam Municipality in 2008. Mind2Care has good psychometric properties with a positive predictive value of 86% and a negative predictive value of 97% (Quispel et al., 2012). As recommended by the ACOG and the NICE guidelines (American College of Obstetricians and Gynecologists Committee on Health Care for Undeserved Women, 2006; National Collaborating Centre For Mental Health, 2007), this digital screen instrument aims to detect mental health problems among pregnant women and to provide tailored intervention advices for women-at-risk instantly.

In this multicentre follow-up study, the Mind2Care instrument was implemented from October 2009 to April 2011 in three Dutch urban areas, covering the three levels of care: three midwifery practices in Rotterdam (primary level of care), two general hospitals in Apeldoorn and Breda (secondary level of care) and the Rotterdam academic hospital (tertiary level of care). In the Netherlands, obstetric health care has a unique organisation. All healthy women with no history of medical or obstetrical complications are monitored by independent midwives (primary level of care). If complications occur or interventions are required during pregnancy or childbirth, women are monitored by obstetricians at a general hospital (secondary level of care) or an academic hospital (tertiary level of care).

The Mind2Care-procedure started at the booking visit or any subsequent pregnancy check-up before the 20th week of gestation. A clinician's assistant asked all pregnant women to complete the Mind2Care questionnaire on a personal digital assistant (handheld computer) in the waiting room in privacy, as part of routine practice.

Exclusion criteria for participation in this study were insufficient command of the Dutch language and insufficient mental capability to complete the questionnaire independently, as judged by the clinician's assistants. As this study was part of routine care, the number of excluded women was not recorded in all practices. On the basis of similar studies with Mind2Care in Rotterdam we estimate that 3% of women were excluded due to a language barrier and 0.2% due to an insufficient mental capability.

Participants with more than 10 missing data in total, or with missing data on the Edinburgh Depression Scale were excluded too ($n = 59$).

Adverse pregnancy outcomes of interest included preterm birth (< 37 weeks of gestation) and small-for-gestational-age (birth weight < p10, adjusted for gestational age at birth, parity and gender of the infant). Post partum, adverse pregnancy outcomes were extracted from medical records.

The set of initial demographic and (psycho)social risk factors was measured by Mind2Care and included socio-economic status (based on postal/ZIP-code; < 20th percentile/20th–80th percentile/ ≥ 80th percentile; < 20th is low), ethnicity (Dutch/Mediterranean/Antillean/Surinamese/Asian/Black/other European/other non-European; further grouped into Dutch/non-Dutch), educational level (low/moderate/high), maternal age (continuous; 16–20/21–25/26–30/31–35/36–40/41–45), gestational age (continuous), primigravidity (yes/no), nulliparity (yes/no), psychiatric history (yes/no), history of psychotropic medication use (yes/no), smoking (yes/no), alcohol consumption (yes/no), and illicit drug use (yes/no).

Socio-economic status data was obtained from the Dutch Social and Cultural Planning Office (Social and Cultural Planning Office, 2010).

Depressive symptoms during pregnancy were considered as a potential mediator of the effect of initial risk factors on PTB and