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SHORT COMMUNICATION

Type of delivery is not associated with maternal depression

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Abstract

Although many women experience depressive symptoms during the first year after childbirth, the relationship between type of delivery and maternal depression is not clear. The purpose of this study is to evaluate relationship between type of delivery and maternal depression, between 6 to 16 months after childbirth. We performed a prospective cohort study of 558 low–socioeconomic status pregnant women without depression. All participants were recruited from primary care clinics of the public sector in three administrative districts in the Western area of the city of São Paulo, Brazil. Depressive symptoms were assessed using the Self-Report Questionnaire (SRQ-20). Type of delivery was classified as uncomplicated spontaneous vaginal delivery (UVD) (no episiotomy and no more than a first-degree perineal laceration), complicated vaginal delivery (CVD) (episiotomy or more than a second-degree perineal laceration), and cesarean delivery (CD). Data about type of delivery were extracted from medical charts. Crude and adjusted risk ratios with 95% confidence intervals were estimated using Poisson regression with robust variance estimates to examine the association between type of delivery with maternal depression. Among 482 women reassessed during 6 to 16 months after delivery, 18% had symptoms of depression. According to the type of delivery, 250 (51.8%), 85 (21.7%), and 147 (30.5%) were UVD, CVD, and CD, respectively. There was no association between type of delivery and maternal depression. In comparison with women submitted to uncomplicated vaginal, women who had a cesarean or perineal trauma/episiotomy did not show greater risk of maternal depression, in the medium to long term after delivery.

Keywords Maternal depression · Pregnancy · Postpartum · Mental disorder · Mode of delivery · Type of delivery

Introduction

Depression in mothers after childbirth is a serious public health problem, with deleterious impact to mother and child (Stuart-Parrigon and Stuart 2014). Depressive symptoms affect 14% of mothers (O'Hara and McCabe 2013) and may persist over the first years after childbirth (Matijasevich et al. 2015). The consequences of chronic or recurrent maternal depression on offspring mental health are well-known (Brennan et al. 2000). There are a number of risk factors in the etiology of postpartum depression (Fisher et al. 2012) but the role of type of delivery remains controversial. There is evidence that postpartum depression is associated with perineal trauma (Dunn et al. 2015), but not with cesarean section (Carter et al. 2006). Studies evaluating operative against spontaneous vaginal deliveries have found positive (Yang et al. 2011) and negative (Patel et al. 2005) associations with depressive symptoms. Most studies evaluated the association between type of delivery and depression during the first few weeks (Dunn et al. 2015) or months (Adams et al. 2012) (Ducarme et al. 2017) after childbirth. The aim of the present study is to evaluate the relationship between type of delivery, considering the presence of perineal injury and/or episiotomy, and depression in mothers between 6 to 16 months after childbirth.

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Material and methods

Study design and sample

This is a secondary data analysis from a prospective cohort study that evaluated the association between antenatal and

postnatal depression (Faisal-Cury and Menezes 2012). The original study was conducted between May 2005 and March 2007, with pregnant women recruited from primary care clinics of the public sector in three administrative districts in the Western area of the city of São Paulo, Brazil. Pregnant women between 20 and 30 weeks of pregnancy, whose conception occurred naturally, aged 16 years or older and with singleton pregnancies, who were receiving antenatal care in primary care clinics in the study area, without a history of psychosis, were considered eligible. For the current study, pregnant women with depression, as assessed by a SRQ-20 score of 8 or more (see below), were excluded.

Instruments

Main outcome

Main outcome was the presence of maternal depression. Antenatal and postnatal depression was assessed with the Self-Report Questionnaire (SRQ-20), which was developed for screening common mental disorders in patients treated in primary care settings. The instrument consists of 20 questions about symptoms and problems (ex. Do you have trouble thinking clearly? Do you feel unhappy?) which have to be answered by yes or no. The SRQ-20 was validated in primary care centers in Brazil, with 85% sensitivity and 80% specificity, using the cutoff point 7/8 (Mari and Williams 1986), which was the cutoff point used in the present study. The SRQ-20 has good psychometric properties for diagnosing perinatal mental disorders, performing even better than instruments specifically designed for this purpose (Pollock et al. 2006; Hanlon et al. 2008)

Main exposure variable

Main exposure variable was type of delivery. Data on method of birth and degree of perineal trauma were combined to provide a single variable. Three categories were used: uncomplicated vaginal delivery (UVD—no episiotomy and no more than a first-degree perineal laceration); complicated vaginal delivery (CVD—episiotomy or more than a second-degree perineal laceration); and cesarean delivery (CD). Data about type of delivery were extracted from medical charts. Selective rather than routine episiotomy has been proposed as best obstetric practice (Carroli and Mignini 2009).

Other variables

A questionnaire applied during pregnancy evaluated sociodemographic and obstetric characteristics. The following variables were collected: mother's age, years of schooling, marital status, skin color, and monthly family income (in tertiles). Obstetric data included number of previous pregnancies, planning of the pregnancy, and previous miscarriage.

Procedures

During the study period, trained research assistants went to the primary care clinics and approached all pregnant women. Eligible women who agreed to participate signed an informed consent form and answered the SRQ-20 and the questionnaire between 20 and 30 weeks of pregnancy. The same group of research assistants applied the SRQ-20 to these women at home after childbirth (mean time of interview after delivery, 11.1 months; standard deviation, 2.3 months; range, 6–16 months). Timing of interviews was divided in three groups: group 1, 6 to 8 months (67 participants, 13.9%); group 2, from 9 to 12 months (275 participants; 57.0%); and group 3, from 13 to 16 months (140 participants, 29.1%).

Statistical analysis

All variables were categorized. The proportion of women reporting maternal depression was calculated. Crude and adjusted risk ratios (RRs) with 95% confidence intervals (95% CIs) were estimated using Poisson regression with robust variance (Coutinho et al. 2008) estimates to examine the association between type of delivery with maternal depression. In the adjusted analyses, we examined the effects of type of delivery on maternal depression accounting for potential confounders. Statistical associations were assessed with chi-square and chi-square for trend. A P value of < 0.05 was considered statistically significant. Statistical analyses were performed using STATA version 12 (StataCorp, College Station, TX, USA).

Results

Five hundred fifty-eight eligible pregnant women were included in the study during the antenatal care period. Of these, 482 (86.4%) women were re-assessed during the postnatal period (see participants flow chart in Fig. 1). Participants had a mean age of 25 years (range 16–44) and most were living with a partner (77.4%). In addition, 46.4% had completed 9 years of education. Regarding to the family income, almost 1/3 of women had a family per capita monthly income below 276 USD. According to the type of delivery, 250 (51.8%), 85 (21.7%), and 147 (30.5%) were UVD, CVD, and CD, respectively (Table 1). Women who were evaluated between 6 to 16 months after childbirth were of similar age, had the same family income and the same number of children but were more educated, and had more singles than the group of 76 women who could not be reached after delivery. Among 482 postpartum women, 87 (18%) had maternal depression. In the bivariate analysis, type of delivery was not associated with maternal depression. None of the sociodemographic or obstetric variables was associated with maternal depression (Table 1). After adjustment for potential

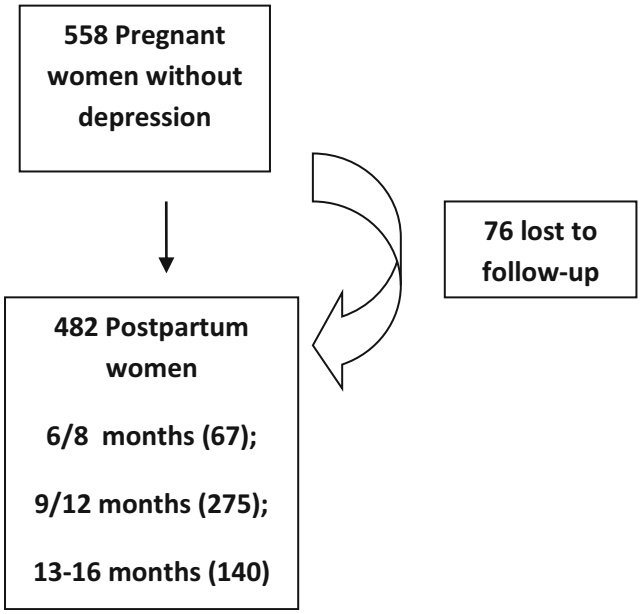

Fig. 1 Participant flowchart

negative confoundings, the lack of association between type of delivery and maternal depression remained unchanged (Table 2).

The type of cesarean (elective or emergency) was not associated with maternal depression either (results not shown).

Discussion

In this cohort study of pregnant women from low socioeconomic status, we found that type of delivery was not associated with depressive symptoms between 6 and 16 months after delivery. Neither cesarean nor vaginal delivery (complicated or not by perineal laceration and episiotomy) increased the risk of depression months after childbirth. Postpartum depression has been associated with several psychosocial risk factors, including antenatal depression, socioeconomic disadvantage, unintended pregnancy, being younger, and being unmarried (Fisher et al. 2012). However, there is limited evidence of a relationship between maternal depression and type of delivery (Adams et al. 2012; Ducarme et al. 2017; Carter et al. 2006). Moreover, many studies did not differentiate the degree of laceration or the use of episiotomy among women submitted to vaginal delivery. The occurrence of perineal trauma might have more impact on women's mental health regardless of being an

Table 1. Type of delivery, sociodemographic, socioeconomic, and obstetric characteristics of the sample, number and percentage of PPD ($n = 482$), relative risk ratios, 95% confidence intervals, and p values

	Type of delivery			
	UVD *N* (%)	CVD *N* (%)	CD *N* (%)	*p* value
Family income (tertiles USD)				< 0.001
0–276	95 (66.4)	14 (9.8)	34 (23.8)	
277–455	77 (47.8)	38 (23.6)	46 (28.6)	
456–2780	77 (43.5)	33 (18.6)	67 (37.8)	
Mothers age				
16–19	48 (51.6)	25 (53.2)	20 (49.2)	
20–29	141 (53.2)	45 (17.0)	79 (29.8)	
30–>	61 (49.2)	15 (12.1)	48 (38.7)	
Skin color				0.015
White	105 (45.1)	46 (19.7)	82 (35.2)	
Black/mixed/other	145 (58.2)	39 (15.7)	65 (26.1)	
Education (years)				0.001
0–4	52 (65.8)	8 (10.1)	19 (24.0)	
5–9	77 (60.1)	20 (15.6)	31 (24.2)	
> 10	119 (43.6)	57 (20.9)	97 (35.5)	
Planned pregnancy				0.053
No	175 (56.0)	50 (16.0)	88 (28.1)	
Yes	75 (44.4)	35 (20.7)	59 (34.9)	
Marriage status				0.04
Not married	65 (55.1)	27 (22.9)	26 (22.0)	
Married	185 (50.8)	58 (15.9)	121 (33.2)	
Previous miscarriage				0.20
No	193 (50.9)	73 (19.2)	113 (29.8)	
Yes	57 (55.3)	12 (11.6)	34 (33.0)	
Previous pregnancies				< 0.001
1	72 (38.9)	57 (30.8)	56 (30.2)	
2	76 (52.4)	17 (11.7)	52 (35.8)	
3 or more	102 (67.1)	11 (7.2)	39 (25.6)	
Time after delivery (months)				0.65
6–8	33 (49.2)	14 (20.9)	20 (29.9)	
9–12	143 (52.0)	43 (15.6)	89 (32.3)	
> 12	74 (52.8)	28 (20.0)	38 (27.1)	

Table 2 Multivariable analysis with crude and adjusted relative risk for PPD, 95% confidence intervals and *p* values

	Maternal depression							
	Total	Yes (%)	*p* value	Unadjusted RR	95% CI	Adjusted RR	95% CI	*p* value
Type of delivery			0.79		0.59			0.68
UVD	250	48 (19.2)		1		1		
CVD	85	14 (16.4)		0.86	(0.49:1.47)	0.84	(0.49:145)	
CD	147	25 (17.0)		0.88	(0.57:1.37)	0.91	(0.59:1.41)	

Adjusted by all variables: family income, mother's age, skin color, planned pregnancy, marriage status, education, previous miscarriage, previous pregnancies, and time after delivery (in months)

unassisted or instrumental vaginal delivery. A cohort study with 153 women over 6 months after delivery found that second-degree laceration or more severe lacerations were associated with maternal depression (Dunn et al. 2015). Another study found that perineal pain, but not attempted operative vaginal delivery, increased the risk of maternal symptoms of maternal depression at 6 months (Ducarme et al. 2017). Our results failed to show this association even though we evaluated women between 6 and 16 months after delivery. In the present study, the length of time between delivery and assessment of maternal depression is longer than in most previous studies, and it is possible that the longer the time since delivery, the weaker is the impact of type of delivery upon women's mental health.

The strengths of our study include a longitudinal assessment of maternal depression up to 16 months after delivery and the representative nature of our sample of pregnant women attending antenatal care in Primary Care Units in the city of São Paulo, a large urban center in a middle-income country. Additionally, data on type of delivery was retrieved from public teaching hospital charts where registration of this type of information is reliable. Finally, we excluded from our analysis antenatal depression, which is a strong predictor of postnatal depression.

Our study has also some limitations. First, the assessment of outcome was based on a screening instrument and some non-differential misclassification is expected in this type of evaluation. However, the SRQ-20 has been validated and is widely used in research (Pollock et al. 2006; Hanlon et al. 2008). Second, we have complete data about maternal depression for 86% (482 of 558) of the original sample of pregnant women, but it is unlikely that the losses would change significantly our estimates, since it is expected that the association between type of delivery and maternal depression among them would be similar to that observed in our analysis. Lastly, our results were obtained from low–socioeconomic status women attending primary care units from the public sector and may not be generalized to postpartum women from higher socioeconomic status, where the determinants of type of delivery differ.

Overall, our study did not show greater risk of depression among women submitted to cesarean or perineal trauma/episiotomy, compared to uncomplicated vaginal delivery in the medium to long term after delivery. This lack of association may be explained by the diversity of psychological, behavioral, and cultural factors that influence women's mental health after delivery. Our finding may have implications for women that request a cesarean section.

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Compliance with ethical standards

The Ethics Committee of the University of São Paulo, School of Medicine, approved the research project (Number 206/2004—approval date 07/2004).

Conflict of interest The authors delcare that they no conflicts of interest.

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