



Very low birth-weight as a risk factor for postpartum depression four to six weeks postbirth in mothers and fathers: Cross-sectional results from a controlled multicentre cohort study

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ABSTRACT

Background: Preterm birth and survival rates of very low birth-weight (VLBW: < 1500 g) infants have increased. Although new parents are frequently affected by depressive symptoms, little is known about prevalence, risk, and predictors of parental postpartum depression (PPD) following VLBW birth. Furthermore, most studies assessing PPD in parents of preterm children relied on self-report only.

Methods: As part of the HaFEn cohort-study, data from the index groups of parents with VLBW infants and the control group of parents with term infants were cross-sectionally analysed. Families were recruited at the three largest centres of perinatal medical care in Hamburg, Germany. PPD was evaluated one month postpartum using standardized questionnaires and clinical interviews. Socioeconomic status, social support, risks during pregnancy, and psychiatric lifetime diagnoses were also assessed. A multiple random coefficient model was used to examine predictors of PPD in both parents simultaneously.

Results: 230 mothers and 173 fathers were included. Depending on the measure, the risk of being postnatally depressed was 4 to 18 times higher in mothers and 3 to 9 times higher in fathers from the index group. The most relevant risk factor for PPD was the birth of a VLBW infant, followed by female sex, lifetime psychiatric disorder, and low social support.

Limitations: Results presented here, are based on cross sectional data. Therefore no temporal relationships can be established.

Conclusions: Our findings highlight the importance of early screening for PPD in both parents of VLBW infants. Factors contributing to developing depression should also be considered in neonatal care.

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1. Introduction

Every year, 15 million infants are born prematurely (< 37 weeks of gestation), and preterm birth rates are increasing worldwide (Blencowe et al., 2013; Howson et al., 2013). In high-income countries, progress in medical care has led to improved survival and long-term outcome among preterm infants with very and extremely low birth weight (very low birth weight < 1500 g: VLBW, extremely low birth weight < 1000 g: ELBW), but considerable risks for child health and development remain a matter of concern

(Saigal and Doyle, 2008). For parents, the birth of a preterm infant is considered as a challenging life event (Arockiasamy et al., 2008; Singer et al., 1999) that has been linked to acute and sustained mental health impairment, including postpartum depression (PPD) (Carter et al., 2005; Miles et al., 2007; Rogers et al., 2013; Treyvaud, 2014; Vigod et al., 2010). For mothers, the perceived loss of parental role (e.g., separation from the infant) was found to be the most stressful aspect in the Neonatal Intensive Care Unit (NICU) (Alkozei et al., 2014; Woodward et al., 2014).

PPD affects an average of 13% of all women in western countries and has long been recognised as a major public health concern (O'Hara and Swain, 1996). Evidence about paternal depression in transition to parenthood is still limited, however, a recent review reported a pooled mean prevalence of 10.4% (Paulson and Bazemore,

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2010). Women are known to be more vulnerable to depression than men (Deecher et al., 2008). In general, a past history of maternal psychiatric illness, depression or anxiety as well as stressful life events during pregnancy and low levels of social support have been identified as the strongest risk factors (Robertson et al., 2004). A pregnancy with multiples (Ross et al., 2011) or with high medical risk (Blom et al., 2010) may also increase the risk for depressive symptoms. Commonly identified factors associated with postpartum depressed mood in fathers are poor relationship satisfaction, low social support, depressive symptoms during pregnancy, neuroticism, stressful life events, socio-economic and demographic factors (Bradley and Slade, 2011; Wee et al., 2011). PPD of one partner was found to be an important predictor of PPD in the other (Escriva-Aguir and Artazcoz, 2011).

Compared with mothers of term infants, mothers of VLBW infants are at higher risk for PPD with a prevalence of up to 40% (Vigod et al., 2010). Evidence about the condition in fathers of VLBW infants is scarce, but relative to fathers of term infants, fathers of preterm infants showed higher levels of depressive symptoms (Carter et al., 2005). Risk factors for PPD in mothers and fathers of VLBW infants are largely unknown. In mothers of VLBW infants, low birth weight and long hospital stay (Herguner et al., 2013) and in mothers of very preterm infants, previous mental health problems (Korja et al., 2008) were associated with increased PPD. In mothers of newborns in the NICU as well as in the general postpartum population, antenatal and/or pre-pregnancy depression (Bergström et al., 2012), depression during a previous pregnancy and difficulties related to delivery were predictive of PPD (Vasa et al., 2014). Unexpectedly, the extent of health impairment in the preterm neonate could not be clearly identified as a potential risk factor for maternal PPD (Vigod et al., 2010). To our knowledge, predictors for PPD in fathers of VLBW infants have not yet been reported.

It is important to note that several risks associated with PPD are also associated with premature births. Depression during pregnancy, SES, social support, stress, antenatal anxiety and stressful events affect both time of delivery (Blencowe et al., 2013; Halbreich, 2005) and PPD rates (Beck, 2001; O'Hara and Swain, 1996; Robertson et al., 2004).

PPD is a well confirmed cause of individual distress and suffering, impairs parenting and increases the risk of cognitive, emotional, behavioural and other health problems in the offspring (Goodman et al., 2011; O'Hara and McCabe, 2013; Ramchandani and Psychogiou, 2009). Similar associations have also been found in preterm and VLBW infants (McManus and Poehlmann, 2012; Treyvaud et al., 2010), although data for the latter are scarce. Furthermore, PPD results in elevated economic costs due to increased utilisation of community care services (Edoka et al., 2011; Petrou et al., 2002). Consequently, PPD requires early detection and intervention. This may certainly hold true for depressed parents of VLBW infants, who have to cope with birth risks and NICU treatment, and simultaneously form positive relationships with their fragile offspring, that has been found to be especially sensitive to parental affective cues and vulnerable to depressed mood (Bugental et al., 2008).

Studies on PPD after the birth of a VLBW infant, using control groups and questionnaires as well as clinical interviews in both parents, are rare. Diverging results of prevalence and risks for PPD reflect the application of different instruments, cut-off scores, timing, and inclusion of dissimilar syndromes or disorders (O'Hara and Swain, 1996; Vigod et al., 2010). Given this relative paucity of research in the field, the aim of our study was 1.) to determine the prevalence and risk of PPD four to six weeks postpartum in parents of a VLBW infant compared to parents after birth at term and 2.) to identify relevant predictors for this condition. We hypothesised that the prevalence and risk of PPD is significantly higher in parents of VLBW infants, and that, besides female sex, VLBW itself as well as a lifetime psychiatric diagnosis are the most important predictors for PPD.

2. Methods

2.1. Study design

The data reported here derive from a larger ongoing longitudinal study, the "Hamburg study of VLBW- and full-term infant development" (HaFEn-Study). From the postpartum period up to eight years of children's age, a cohort of families with VLBW infants and a control group with term infants from the greater area of Hamburg, Germany, is prospectively followed to investigate associations of parental mental health and the physical and mental development of the children. Sources of information are mothers, fathers, medical records, expert examinations, the children themselves and their teachers. The study utilises standardized questionnaires, clinical interviews, development testing and structured assessment of the parent-child relationship. Here we present cross-sectional data from the baseline assessment four to six weeks postpartum. The study was approved by the Ethics Committee of the Chamber of Physicians in Hamburg, Germany. Informed consent was obtained from both parents, and if indicated, all families were offered psychological counselling throughout the study.

2.2. Variables and instruments

2.2.1. Outcome variables

To assess the full range of emotional and physical depression symptoms four to six weeks postpartum, two psychometric questionnaires and a structural clinical interview as gold standard to obtain a valid diagnosis, were used:

The Edinburgh Postnatal Depression Scale (EPDS, (Cox et al., 1987), German version (Herz et al., 1997)) is a widely used and well validated specific screener for PPD. It assesses the severity of 10 emotional depressive symptoms during the past seven days. The four response categories generate a score ranging from 0 to 30. According to the recommendation of Matthey et al. (2006), the validated cut-off score ≥ 13 in mothers was used. For direct comparisons of mothers and fathers, we decided to use the same cut-off score.

The Beck Depression Inventory (BDI, (Beck and Steer, 1987), German version (Hautzinger et al., 1995)) is a 21-item screener for depression that is well established and validated (Beck et al., 1988). The four response categories generate a score ranging from 0 to 63. A score ≥ 18 indicates a clinically relevant depression, including physical symptoms (Beck and Steer, 1987).

The Structured Clinical Interview for Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (SCID-I, (First et al., 1996), German version (Wittchen et al., 1997)) is a widely used interview to obtain current and lifetime diagnoses of DSM-IV Axis I disorders. Validation studies reported sufficient reliability and validity (Lobbestael et al., 2011). For the present analyses, diagnoses of the following modules were used: mood disorders (current and lifetime) and anxiety disorders (lifetime).

2.2.2. Predictor variables

Based on the empirical evidence of risk factors for PPD in mothers and fathers of preterm and term infants, the following predictors were included in the analyses: sex, lifetime psychiatric diagnoses (depressive disorders and anxiety disorders), birth status (VLBW/term), socio-economic status (SES), social support, risks during pregnancy, primipara and multiples.

Lifetime psychiatric diagnoses were assessed with the SCID-I. SES was assessed with the German Winkler-Index (Winkler and Stolzenberg, 1999) that refers to education, occupation and income (parental self-report). Each dimension can be scored

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