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Research paper

Perinatal mood episodes in fathers with bipolar disorder

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ABSTRACT

Background: No published research into perinatal mood episodes (PMEs) among fathers with bipolar disorder (BD) exists despite the perinatal period being a time of high-risk for mothers with BD. This study aims to determine the frequency, polarity and timing of onset of PMEs in a large sample of fathers with BD.
Method: Data on PMEs were collected from 196 fathers with a DSM diagnosis of BD. Participants were asked via a self-report questionnaire about the occurrence, type and timing of PMEs during pregnancy up to 6 months postpartum. Findings were compared to data on PMEs collected from mothers with BD using the same method (n = 597).
Results: 36.2 % of fathers with BD reported experiencing PMEs, with similar proportions reporting depression and high/mixed mood/psychosis (17 % and 18.6 % respectively). Episode onset was most common during pregnancy (41.9 %) (compared to within 1-week, 1 to 6-weeks, and 6 weeks to 6 months postpartum respectively). Rate of PME in mothers was higher (73.0 %), with high/mixed mood/psychosis more common than depression (44.5 % v 28.1 %), and most common onset within 1-week postpartum (41.3 %).
Limitations: Rates of paternal PMEs in BD in this study are likely inflated due to methodology.
Conclusions: PMEs were commonly reported among fathers with BD. Fathers do not undergo the same biological changes as mothers during the perinatal period which may partly explain the different patterns observed in the type and timings of PMEs between fathers and mothers with BD. Prospective longitudinal studies are needed to explore specific potential risk factors.

1. Introduction

For women who have bipolar disorder (BD), the perinatal period (during pregnancy and up to 12 months post-delivery) is a time of high risk for recurrence of mood episodes. A meta-analysis by Masters et al. (2022), estimated that 54.9 % of women with BD experience one or more mood episodes during the perinatal period. Episodes of post-partum non-psychotic depression (PPD) are common in women with BD, occurring in 19–60 % of deliveries (Mandelli et al., 2016; Viguera et al., 2011). In particular, women with bipolar I disorder (BDI) are at high risk of developing mania/psychosis with episodes occurring following approximately 20 % of deliveries (Perry et al., 2021a). The majority of these episodes onset in the first six weeks postpartum (Perry et al., 2021a). Severe postpartum mood disorders are associated with adverse consequences for the mother, child and wider family; placing the mother at increased risk of suicide (Gressier et al., 2017) and the infant at risk of developmental impairment (Hoffman et al., 2017). The causes of maternal perinatal recurrence of BD are complex, multifactorial and poorly understood. Neurobiological factors including genetic factors (Jones and Craddock, 2001; Perry et al., 2021b; Robertson et al., 2005), hormonal changes and immunological factors have all been implicated (Jones et al., 2014; Perry et al., 2021b). Other proposed risk factors include psychosocial stress (Hazelgrove et al., 2021), sleep loss (Lewis et al., 2018; Perry et al., 2024) and primiparity (Di Florio et al., 2014; Munk-Olsen et al., 2014) as well as psychotropic medication change or withdrawal, and obstetric complications (Jones et al., 2014; Perry et al., 2021b).

The transition to parenthood is a period of significant adjustments

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not only for mothers but also fathers. In recent years there has been growing awareness and research into paternal perinatal mental illness (Fisher et al., 2021; Wong et al., 2016). To date this research has mainly focused on paternal postpartum depression in general population samples indicating approximately 1 in 10 fathers experience postpartum depression (Cameron et al., 2016; Paulson and Bazemore, 2010; Rao et al., 2020). Paternal mental illness has been shown to have a wide range of negative effects on the father, child development and whole family (Cui et al., 2020; Fisher et al., 2021). A previous systematic review and meta-analysis reported history of mental illness as the strongest of nine factors influencing paternal postpartum depression (Wang et al., 2021). There are a limited number of case reports of individual fathers experiencing BD mood episodes in the perinatal period (Shahani, 2012; Stevens et al., 2014). However, to date there is no published research into the frequency of perinatal mood episodes (PMEs) among fathers who have BD.

This study aims to determine the frequency, polarity and timing of onset of PMEs in a large sample of fathers with BD, and to compare these findings to data on maternal perinatal BD mood episodes from the same sample, collected and measured using the same method.

Understanding the frequency, presentation and timing of PME recurrence in fathers with BD may be useful for early identification and future prevention of paternal BD episodes, and may inform perinatal healthcare provision for fathers with BD. Moreover, as investigation of BD perinatal recurrence in men controls for female-specific biological factors associated with pregnancy and delivery, this study may improve understanding of the aetiology and triggers of perinatal BD episodes.

2. Method

This study was part of an on-going research programme into the genetic and non-genetic aetiology of BD (Bipolar Disorder Research Network). The research programme has UK National Health Service (NHS) Health Research Authority (HRA) approval - Research Ethics Committee (REC) reference (MREC/97/7/01) and local approvals in all participating NHS Trusts/Health Boards.

2.1. Participants

Participants were recruited into the research programme from across the UK using both systematic and non-systematic recruitment methods. Participants were recruited systematically via National Health Service (NHS) psychiatric services (community mental health teams and lithium clinics). Non-systematic recruitment methods included advertising for volunteers using local and national media and through UK-based charities for individuals with BD, for example Bipolar UK.

The research programme inclusion criteria were: i) DSM-IV/DSM-5 diagnosis of bipolar disorder (bipolar disorder type I, bipolar disorder type II, schizoaffective disorder bipolar type or bipolar disorder not otherwise specified) (American Psychiatric Association, 2013, 2000), ii) aged at least 18 years, iii) mood symptoms to have started before the age of 65 years, iv) able to provide written informed consent, and v) of European ancestry due to the focus of the research programme on genetic risk factors. Potential participants were excluded if they: i) had only experienced affective illness in relation to, or as a consequence of, alcohol or substance abuse or dependence; ii) had only experienced affective illness as a consequence of medical illness or medication; iii) were biologically related to another study participant.

This study was carried out using a subset of BDRN participants who were fathers of biological children and provided data about mood episodes in relation to the perinatal period ($n = 196$). All fathers included in this study identified as men and reported male sex recorded at birth, and lived with the birthing parent of the child during pregnancy and 6 months postpartum. Data were also collected on 597 birthing parents, who all identified as women/mothers, who were part of the BDRN research programme at the same time.

2.2. Psychiatric assessment of bipolar disorder

A trained BDRN interviewer collected lifetime clinical data on participants using the semi-structured Schedules for Clinical Assessment in Neuropsychiatry (SCAN) interview (Wing et al., 1990). Available psychiatric case notes were used to corroborate and supplement interview data, with best-estimate main lifetime DSM diagnosis and lifetime clinical ratings (such as age of illness onset and number of mood episodes) derived from all clinical data available. Inter-rater reliability was high. Mean kappa statistic was 0.85 for DSM diagnosis.

2.3. Mood episodes in perinatal period

Data regarding the occurrence of PMEs were collected using a bespoke self-report questionnaire administered as part of a larger questionnaire mailout (overall response rate 28 %). Participants who had children were asked to report if they had ever experienced an episode of mood illness starting during pregnancy or within 6 months postpartum. If yes, participants were asked to indicate the type of mood episode experienced (depression/mania/hypomania/mixed mood/psychosis without mood symptoms with brief definitions provided) and the timing of the onset (during pregnancy/within 1-week postpartum/between 1- and 6-weeks postpartum/between 6-weeks and 6-months postpartum) focusing on the most severe episode.

2.4. Data analysis

Data were analysed using SPSS version 29. Demographic variables and the frequency, polarity and timing of onset of PMEs were compared between fathers and mothers. Non-parametric statistical tests were used (chi-square tests for categorical data and Mann-Whitney *U* tests for continuous data) as data were not normally distributed.

3. Results

Table 1 describes the demographic and clinical characteristics of fathers and the comparison sample of mothers. Fathers ($n = 196$) had a median current age of 60 years, 56.1 % had completed higher education and 27.4 % had been recruited systematically. The majority had a DSM diagnosis of bipolar I disorder (66.3 %) or bipolar II disorder (29.6 %). The median age at onset of BD was 25 years. The median number of episodes of depression and (hypo)mania per illness year was 0.26 and 0.20 respectively. In comparison to fathers, mothers ($n = 597$) were significantly younger ($p = 0.001$), were less likely to have completed

Table 1
Demographic and lifetime clinical characteristics of fathers with bipolar disorder and comparison sample of mothers with bipolar disorder.

	Fathers (n = 196)	Mothers (n = 597)	*p*
Current age, years, median (IQR)	60 (14)	56 (17)	**0.001**
Higher education, % (n)	56.1 (96/171)	46.3 (252/544)	**0.025**
Systematically recruited, % (n)	27.4 (51/186)	24.1 (140/580)	0.368
Bipolar type:			
Bipolar disorder type I, % (n)	66.3 (130)	67.7 (404)	0.818
Bipolar disorder type II, % (n)	29.6 (58)	27.3 (163)	
Schizoaffective disorder bipolar type, % (n)	1.0 (2)	1.8 (11)	
Bipolar disorder not otherwise specified, % (n)	3.1 (6)	3.2 (19)	
Age of onset of bipolar disorder, median (IQR)	25 (17)	20 (12)	**<0.001**
No. episodes depression per illness year, median (IQR)	0.26 (0.37)	0.27 (0.41)	0.135
No. episodes hypo(mania) per illness year, median (IQR)	0.20 (0.31)	0.20 (0.34)	0.908

Total Ns vary due to unknown/missing data.

higher education ($p = 0.025$) and had a younger age of onset of BD ($p < 0.001$). There were no significant differences in method of recruitment, BD type and number of episodes of depression and hypo(mania) per illness year between fathers and mothers.

3.1. Frequency and polarity of perinatal episodes

36.2 % of fathers reported experiencing a PME (of any type) (Table 2), with 17 % reporting an episode of low mood and 18.6 % an episode of (hypo)mania/mixed/psychosis. 23 % of fathers reported they were unsure if they had experienced a PME and the remainder (40.8 %) reported not experiencing a PME. If all of the 'unsure' ratings did experience an episode the PME rate among fathers could be as high as 59.2 %. There was an overall significant difference in the rate of PME between fathers and mothers with 73 % of mothers reporting an episode, 8.4 % being unsure and 18.6 % reporting no PME ($p < 0.001$). Compared to mothers, fathers were significantly less likely to have experienced a perinatal episode of both depression (17 % vs 28.1 %, $p = 0.002$) and (hypo)mania/mixed/psychosis (18.6 % vs 44.5 %, $p < 0.001$).

3.2. Time of onset of perinatal episodes

The most common time for a PME to occur among fathers was during the pregnancy (41.9 %) (Table 3, Fig. 1). This was followed by 25.8 % of fathers experiencing an episode between 6 weeks and 6 months postpartum and 21 % experiencing a PME within a week postpartum. There was an overall significant difference in the timing of onset of episodes between fathers and mothers ($p < 0.001$). Most mothers reported the onset of a PME within 1-week postpartum (41.3 %) followed by between 1 and 6 weeks postpartum (24.8 %) and during pregnancy being the least common (21.7 %).

4. Discussion

This study is the first to examine the prevalence of PMEs among fathers with BD. In our sample over one third of fathers reported experiencing a PME (36.2 %). The proportion of fathers reporting PMEs of depression and high/mixed mood/psychosis was similar (17 % and 18.6 % respectively). 41.9 % of fathers experienced a mood episode during their partner's pregnancy compared to 58.1 % during the first six months postpartum. During the postpartum, the most common time to experience an episode was within six weeks to six months (25.8 % of those experiencing an episode in the perinatal period) followed by within one week postpartum (21 %). The period of lowest risk of recurrence was during 1 to 6 weeks post-partum (11.3 %). The overall rate of PMEs found among fathers with BD in our study (1 in 3) is higher than the rate of paternal postpartum depression reported in meta-analyses in general population samples (1 in 10 fathers) (Cameron et al., 2016; Paulson and Bazemore, 2010; Rao et al., 2020). However there is no direct previous research among fathers with BD with which to compare our findings. Nevertheless, our findings suggest that the occurrence of mood episodes among fathers with BD is high both in pregnancy and the postpartum.

Table 2
Rate of perinatal mood episodes (PME) among fathers with bipolar disorder and comparison sample of mothers with bipolar disorder.

	Fathers (n = 196)	Mothers (n = 597)	*p*
Ever experienced PME:			
Yes, % (n)	36.2 (71)	73.0 (436)	**<0.001**
Unsure % (n)	23.0 (45)	8.4 (50)	
No, % (n)	40.8 (80)	18.6 (111)	
PME polarity:			
Low mood/depression, % (n)[a]	17.0 (33/194)	28.1 (165/587)	**0.002**
(Hypo)mania/mixed mood/psychosis, % (n)[a]	18.6 (36/194)	44.5 (261/587)	***p* < 0.001**

[a] 2 fathers and 10 mothers who were unsure about the type of episode they had experienced are not included the analysis.

Table 3
Timing of onset of perinatal mood episodes among fathers with bipolar disorder and comparison sample of mothers with bipolar disorder.

	Fathers (n=62[b])	Mothers (n=424[b])	*p*
During pregnancy, % (n)	41.9 (26)	21.7 (92)	**p < 0.001**
Within 1-week postpartum, % (n)	21.0 (13)	41.3 (175)	
Between 1- and 6-weeks postpartum, % (n)	11.3 (7)	24.8 (105)	
Between 6-weeks and 6-months postpartum, % (n)	25.8 (16)	12.3 (52)	

[b] 9 fathers and 12 mothers who experienced a mood episode but could not recall timing are not included in the analysis.

Almost one quarter (23 %) of fathers reported uncertainty as to whether they experienced a PME, while <10 % of mothers were unsure. This uncertainty could be due to the retrospective reporting of the questionnaire, particularly as the questionnaire did not record the age at which participants had their children and the median age of fathers in the sample was 60 years compared to 56 years among mothers. However, further post-hoc analysis showed no significant difference in age among fathers who reported experiencing a PME episode, those who did not and those who were unsure (data not shown) suggesting the uncertainty among fathers cannot be fully accounted for by potential age-related recall biases. Our results are also consistent with prior research that has suggested there is a phenomenon of underreporting of mood episodes in men, likely influenced by stigma, masculine gender norms, limited awareness, and differing symptom presentations (Seidler et al., 2016; Shi et al., 2021). The underreporting may also stem from a lack of gender-sensitive diagnostic tools, underscoring the need for tailored approaches to identifying and managing paternal PMEs in the future.

Despite there being no previous directly comparable research among fathers with BD, we were able to compare our findings to data on mothers with BD in our sample collected and measured in the same way. Overall rates of PMEs were lower among fathers compared to mothers. Whereas rates of depression and high/mixed mood/psychosis were evenly reported among fathers, in contrast, mothers reported a preponderance of episodes of high/mixed mood/psychosis. Differences were also seen in the time of onset of PMEs with fathers most commonly reporting an episode with onset during pregnancy and mothers in the first week postpartum. These differences in rates, characteristics and timing of PMEs between fathers and mothers with BD, suggest potential sex-based variations in the manifestation of BD during the perinatal period. Fathers control for many of the biological determinants of BD mood episodes relating to pregnancy and childbirth as they do not undergo the same physiological changes as mothers.

Mothers most commonly reporting a mood episode within the first week following delivery and a preponderance of episodes of high/mixed mood/psychosis is congruent with previous research where most perinatal episodes of mood disorder in women with BD occurred within 4 weeks postpartum (Di Florio et al., 2013) and the increased risk of postpartum psychosis among mothers with BD (Maguire et al., 2020; Perry et al., 2021b). Post birth there is a rapid withdrawal of progesterone and oestrogen, among other hormonal changes, which coincide with the peak in mood episodes. Though hormone levels between women experiencing postpartum affective episodes do not appear to differ from healthy controls (Bloch et al., 2000), sensitivity to the fluctuations in hormones have been implicated to play a role in the aetiology of postpartum mood episodes including postpartum psychosis in women with BD (Perry et al., 2021b). However, this is only one factor that has been suggested as a mechanism behind the higher incidence of mood episodes in mothers in the immediate postpartum. Dysfunction of immunological systems has also been proposed as a possible biological

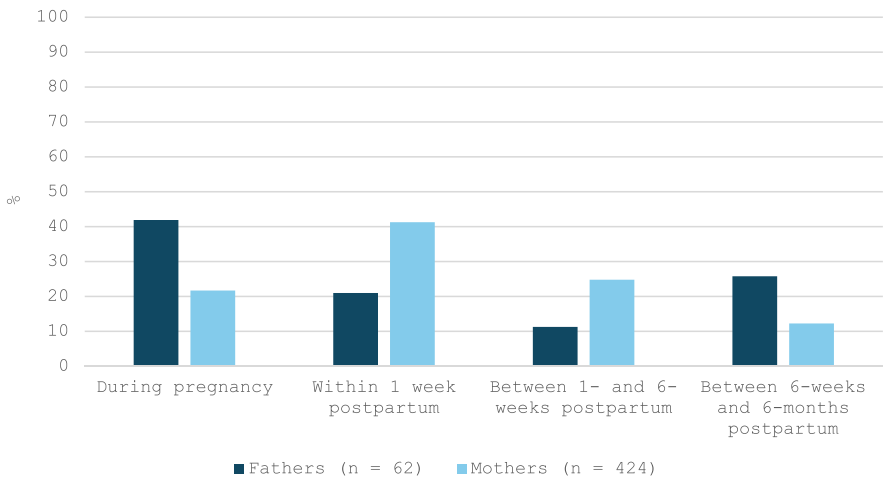

Fig. 1. Comparison of time of onset for paternal and maternal perinatal mood episode.

cause (Drexhage et al., 2025; Hazelgrove, 2021).

Fathers do not undergo the same biological changes as mothers during the perinatal period, highlighting the potentially greater role of psychosocial factors in both perinatal episodes occurring outside of the immediate postpartum and those of a depressive polarity in BD. Outside of BD, paternal postpartum depression in the general population has been found to be associated with perceived stress, financial pressure, low social support and negative life events (Wang et al., 2021). There is increasing evidence that sleep disruption plays a role in PMEs for women with BD (Perry et al., 2024). Outside of the perinatal period, sleep disturbances are common in BD both within and between mood episodes (Ng et al., 2015). Furthermore sleep changes in BD have been found to precede mood changes (Ulrichsen et al., 2025). This suggests that sleep disruption may also be an additional risk factor for fathers with BD in the perinatal period, particularly in the postpartum where both mothers and fathers are likely to experience sleep disturbance.

4.1. Strengths and limitations

This study has a number of strengths. First, the sample size was large (196 fathers with BD). Secondly, the participants had well-characterised BD according to in-depth research interviews. Thirdly, the same method was used to acquire the sample of mothers. As data had been collected in the same way for mothers and fathers, the data are directly comparable.

However, there is also a key limitation to this study: rates of paternal perinatal BD mood episodes are likely to be inflated due to the methodology. We found increased rates of maternal perinatal BD mood episodes when compared to those reported in other literature. For example, while our study found that almost three-quarters (73 %) mothers with BD reported experiencing a PME, a prospective study found the rate of maternal perinatal BD mood episodes to be lower, with 57 % of women with BD type I or schizoaffective disorder bipolar type, and 62 % of women with BD type II or BD not otherwise specified, experiencing perinatal recurrence defined using DSM criteria (Perry et al., 2021a). This highlights that the retrospective nature of the current study is likely to have contributed to inflated reported rates of PMEs. Furthermore, our PME measure was based on self-report and we are unable to establish if the episodes would meet criteria for DSM mood episodes which is likely to have further inflated the reported rates among both fathers and mothers.

A further potential compounding cause of inflated rates in this study may be that fathers who had experienced a PME may have been more likely to respond to the study questionnaire. The perinatal questionnaire was part of a larger questionnaire mailout with individual questionnaires covering topics unrelated to PMEs. The overall response rate of the mailout was 28 % with those responding completing all questionnaires in the package and so the decision to complete the questionnaire is unlikely to have been based solely on perinatal interest. However, those responding may have been more motivated to be actively involved in the ongoing BDRN research programme at the time of the questionnaire mailshot which limits the generalisability of the findings. Participants within our sample were of European ancestry due to the focus of the research programme on genetic risk factors which further limits the generalisability of our findings.

4.2. Recommendations for future research

As this is the first published research study into paternal BD mood episodes, it requires replication. Additionally, in-depth psychiatric interviews should be used to gather future data on PMEs. The data for this study was gathered via a questionnaire, as part of a larger questionnaire pack, and to increase the chances of completion of questionnaires, the data requested was limited. This has resulted in absent information, for example, whether first-time fathers with BD are at greater/lesser risk of PMEs than fathers having subsequent children. Prospective longitudinal studies are needed to explore the potential risk factors for the occurrence of PMEs among fathers with BD including sleep, parity and psychosocial stress as well as the role of other factors including the quality of couples dyadic functioning and social support. This future research could identify both overlapping and unique risk factors for the occurrence of PMEs among fathers with BD compared to mothers with BD and also to fathers without BD, and identify if there is a need for the tailored detection and management of PMEs among fathers with BD.

CRediT authorship contribution statement

Ruth Brooks: Writing – review & editing, Writing – original draft, Formal analysis. **Jemima Marsden:** Writing – review & editing, Writing – original draft, Formal analysis. **Berenice Mahoney:** Writing – review & editing, Conceptualization. **Amy Perry:** Writing – review & editing, Data curation. **Ian Jones:** Writing – review & editing, Funding acquisition. **Katherine Gordon-Smith:** Writing – review & editing, Formal analysis, Data curation, Conceptualization. **Lisa Jones:** Writing – review & editing, Funding acquisition, Data curation, Conceptualization.

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sources had no role in the study design, in the collection, analysis, interpretation of data, in the writing of the report and in the decision to submit the article for publication.

Declaration of competing interest

None.

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