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Fatherhood too soon. Anxiety, depression and quality of life in fathers of preterm and term babies: a longitudinal study?

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Abstract

Introduction: Fathers are increasingly recognized as playing a critical role in the family unit and emotional development of children. The birth of a preterm baby can be confronting, yet there is limited research that explores how preterm birth might impact on fathers emotional wellbeing and quality of life. The aim of the study was to monitor quality of life and psychological wellbeing in a group of fathers to explore if a preterm birth altered outcomes in these two domains.

Methods: Institutional ethics committee approval was obtained. 1000 men were recruited in the antenatal period via their pregnant partner, and completed the Hospital Anxiety and Depression Scale (HADS) and Satisfaction with Life Scale (SWLS) in the third trimester and again 6 weeks after the birth of their baby. Birth records were independently audited to determine which fathers experienced preterm birth.

Results: Data was available for 1000 and 950 fathers at each time point. Overall, 7.2% of fathers experienced preterm birth. Fathers of preterm infants were significantly older ($p=0.002$) and less likely to be married or in a defacto relationship ($p=0.043$). Babies were more likely to be delivered by caesarean section, have a low birthweight and require admission to a special care or neonatal intensive care unit ($p<0.0001$). There were no significant differences in HADS total, anxiety or depression subscale and SWLS scores in the antenatal period. By 6 weeks postpartum, fathers of preterm babies were more likely to meet the case criteria for an anxiety disorder (26.5% versus 15.8%, $p=0.02$) and had significantly lower SWLS scores (27.31 versus 27.88, $p=0.01$). However there were no differences in HADS total or depression subscale scores.

Conclusion: Following birth of a preterm baby, persisting anxiety may affect quality of life of fathers. Routine screening of fathers of preterm babies may help identify men who could benefit from early referral for psychological intervention.

Introduction

Recent estimates suggest that the rate of preterm birth is increasing in most countries, with a global prevalence of 11.1% of all livebirths (1,2). Each year approximately 15 million families experience preterm birth (1). Preterm birth is a leading cause of death in children, resulting in approximately 1 million deaths each year (1,2). It is also the leading cause of morbidity in children, resulting in adverse motor, cognitive, behavioural and psychological sequelae (3,4). It is a major economic burden in terms of immediate neonatal intensive care, long-term health demands of affected children and loss of economic productivity of parents and child (1,2,3,4).

The impact of a preterm birth on the family is profound (5). Mothers of preterm infants report feeling fearful and concerned over their capacity to care for their child (6). Some mothers also report anger, grief and guilt (6). Mothers of preterm babies report significantly higher rates of postnatal depression compared to mothers of term infants (7,8). This is thought to be aggravated by the need to make frequent return visits to hospital, a need to cope with siblings and travel long distances between their home and the neonatal unit (6,7,8).

There is less data about the impact of preterm birth on fathers. However, existing data suggests some fathers feel frustrated as they cannot fulfill their role as protector and caretaker of their family (8). Fathers report feeling isolated from their baby as the hospital staff focus on the needs of mother and newborn (9).

Protecting the psychological health of the parents of preterm babies is important, as parental care plays a significant role in long-term outcomes of premature infants (10,11). When parents have high levels of anxiety and depression in the postnatal period, developmental outcomes of preterm infants are poor (10,11).

Few longitudinal studies have specifically explored how the birth of a preterm baby affects the psychological health and quality of life of fathers. Our study aim was to measure psychological symptomatology and quality of life in

a large cohort of expectant fathers to explore whether fathers of preterm babies explore a difference in psychological symptoms trajectory compared to fathers of term infants. Our primary hypothesis was that preterm birth would adversely affect psychological health and quality of life.

Methods

A longitudinal study was performed. The study had institutional ethics committee approval and was registered with the Joondalup Health Campus Registry and registered with the Australian and New Zealand Clinical trials registry. Each participant provided written informed consent.

If the pregnancy was complicated by a known fetal anomaly, or the mother did not provide consent for paternal participation, or the fathers lacked sufficient English to complete questionnaires and an interpreter was not available, they were excluded from participation. Fathers completed a baseline questionnaire in the third trimester of pregnancy and another questionnaire six weeks after the birth. Antenatal questionnaires were collected directly from fathers, after completion, by research staff. Fathers were provided with stamped addressed envelopes for return of the 6-week postnatal questionnaire. To improve response rates, fathers were repeatedly reminded to complete delivery questionnaires by text reminder message. Research students also contacted some fathers by telephone to encourage compliance.

Questionnaires included background demographics, pregnancy outcomes, levels of anxiety and depression as measured by the Hospital Anxiety and Depression Scale (HADS) (12,13,14) and quality of life as measured using the Satisfaction with Life Scales (SWLS) (15).

The HADS is a widely used screening tool to identify emotional distress in non-psychiatric patients (12,13,14). HADS does not identify specific mental health disorders but has been shown to be effective as a more general measurement of mental distress. The HADS is a questionnaire consisting of independent sub-scales for anxiety and depression (14). A total of 14 questions: seven relate to anxiety and seven to depressive symptoms. Scores

on each sub-scale can be interpreted in ranges: normal (0-7), mild (8-10), moderate (11-14) and severe (15-21). It excludes symptoms of physical feeling or sensation, therefore avoiding potential confounding by somatic symptoms (12,13,14). Scoring equal to or greater than 8 on a HADS sub-scale is considered positive for anxiety or depression (12,13,14).

The SWLS is a five-item questionnaire that measures global evaluation of satisfaction with one's life (15,16). SWLS does not specify the context of pregnancy and fatherhood. It assesses overall contentment with life as a subjective measure based on personal standards. SWLS has reliable test-retest validity for the purpose of comparison with antenatal, delivery and postnatal data (15,16).

The primary hypothesis was that fathers of preterm babies would experience higher rates of anxiety and depression compared to fathers of term infants. Studies of men from various international community samples report that approximately 10% have a HADS anxiety and/or depression subscale score greater than 8 (12,13,14). However, in populations of men with a diagnosed psychiatric condition, more than 78% of men have a subscale score greater than 8 (13,14). We predicted that preterm birth might increase the percentage of men with a positive subscale score in anxiety or depression domains from 10% to 25%. In order to have greater than 80% power to detect this difference with an alpha error of 0.05, we needed a sample size of at least 95 fathers who had a preterm baby. Assuming 10% of babies were born preterm, we needed a total sample size of 950 fathers.

Delivery data were audited and questionnaire data coded by a researcher blinded to status of the father. Data were entered onto a dataset and analysed using Minitab® (version 16, University of Melbourne). To test for differences between groups, significance was determined by Chi Square test for discrete data and student t test for continuous data. A p-value of less than 0.05 was significant.

Results

Overall, 1021 fathers were recruited via their pregnant partner in the second half of pregnancy and gave consent to participate in the study. However, 21 fathers relocated during the study and outcome data on birth were not available. These fathers were excluded from analysis. Data were available on 1000 and 950 fathers at each time period. The demographic characteristics of fathers are summarised in Table 1. Overall, 7.2% of fathers had a preterm baby. Fathers of preterm infants did not differ to fathers of term infants in terms of country of birth, education, employment, smoking status and first time father status. However, fathers of preterm babies were significantly older (32.10 years [6.09] versus 31.01 years [6.17]; $p=0.002$) and less likely to be married or in a defacto relationship (90% versus 96%; $p=0.043$).

Table 2 summarises newborn outcomes. There were no significant differences in gender of newborn. However, preterm babies were significantly more likely to be induced or be born by elective caesarean ($p=0.039$). They were significantly less likely to be born by vaginal delivery ($p=0.017$). They were significantly more likely to have low birth weight ($p<0.0001$) and require admission to special care or neonatal intensive care nursery ($p<0.0001$).

HADS and SWLS data outcomes are summarized in Table 3. In the antenatal period, there were no significant differences in HADS total, anxiety or depression subscale and SWLS scores. Six weeks after the birth, fathers of preterm babies had significantly higher rates of anxiety disorder as assessed by a positive HADS-anxiety subscale score, compared to fathers of term babies (26.5% versus 15.8%, $p=0.02$). They also reported significantly lower SWLS scores compared to fathers of term infants (27.31 versus 27.88, $p=0.01$). However there were no differences in depression subscale or HADS total scores.

The difference in anxiety results at six weeks occurred because fathers who experienced preterm birth reported persisting levels of anxiety between pregnancy and the postnatal period (antenatal 25%, postnatal 26.5%; $p>0.05$).

In contrast, 30% of fathers of term infants with anxiety symptoms meeting the HADS case criteria for anxiety in the third trimester of pregnancy reported resolution of these symptoms in the postpartum period (antenatal 22.7%, postnatal 15.8%, $p < 0.0001$). Thus the difference between the two groups emerged because fathers of term babies significantly improved, whereas fathers of preterm babies had persisting anxiety.

Discussion

The key findings of the study were that fathers of preterm babies have significantly higher rates of anxiety and lower quality of life scores at 6 weeks postnatal compared to fathers of term babies. This occurred because fathers of preterm babies had persisting symptoms of anxiety that extended from the antenatal period into the puerperium.

In the third trimester of pregnancy, one quarter of fathers reported anxiety symptoms sufficient to meet the case criteria of an anxiety disorder on the HADS-anxiety subscale. However, in the fathers who had a term baby, levels of anxiety fell after the birth and 30% of fathers with antenatal anxiety were no longer anxious at 6 weeks. This suggests they may have experienced a reactive anxiety disorder that resolved with the birth of their term baby. In contrast, fathers with high levels of anxiety in the antenatal period had persisting anxiety after experiencing preterm birth.

There are several reasons why fathers of preterm babies might have persisting anxiety. Unlike fathers of term babies who could take their babies home immediately after birth, 97% of fathers of preterm babies had their baby admitted to a special care or neonatal intensive care facility. This delayed the discharge of the baby to the home environment. Furthermore, 46% of mothers delivering preterm babies delivered by caesarean section, and this also would have delayed maternal discharge and recovery. This isolation could contribute to persisting anxiety. Having a preterm, low birth weight baby in a special care or neonatal intensive care nursery would also directly contribute to anxiety.

Other authors have reported adverse levels of stress in fathers of preterm infants and attributed this to fathers trying to hide their emotions in

order to protect their partner (18). Fathers have described the experience of caring for a preterm baby as “a pendulum that is easily disturbed” and feel distant to interventions and an outsider to events around their baby (19). They report living with worry (19).

In regards to depressive symptomatology, we found that rates of depressive symptomatology were not significantly increased in fathers of preterm babies compared to fathers of term babies and remained within levels reported for normative samples (17). Other authors have noted increased rates of depression in fathers of preterm infants. One study reported that a third of fathers met the case criteria for depression (18). However these studies did not have the advantage of following fathers from the antenatal period to detect baseline levels of symptoms.

We also found fathers of preterm infants had significantly lower quality of life scores compared to fathers of term infants. The mean difference of 0.57 means approximately half the fathers of preterm babies expressed one scale point lower in global satisfaction compared to fathers of term babies, and represents a clinically relevant change. This data is novel as prior research has failed to specifically explore quality of life factors in fathers of preterm babies. A recent review that evaluated outcomes from 11 quantitative and one mixed methods study reported that factors related to individual fathers were not addressed in any of the published studies (20).

The strengths of this study are that it is longitudinal and could explore how symptoms changed before and after the birth of a preterm baby. The study sample was large and captured fathers from a variety of backgrounds, including those where English was a second language through the use of interpreters. The limitations are that the study excluded fathers where the mother was not in contact with the father or objected to paternal participation.

Our research indicates that many fathers report symptoms of anxiety in pregnancy. However these symptoms are more likely to persist in fathers of preterm babies. Persisting anxiety may adversely impact upon family dynamics and resilience of fathers to provide care for their partners and child.

Consideration should be given to screening fathers of preterm babies to detect persisting anxiety and offer appropriate care.

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Declaration of interest statement

The authors report no conflicts of interest.

Author's contributions

JQ undertook concept, design and ethics approvals. IP was involved in recruitment, scoring of data and data entry. Both authors performed the analysis. Both authors drafted and subsequently approved the final manuscript for submission.

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Table 1: Demographics of fathers

Variable	Fathers of term babies (N=928)	Fathers of preterm babies (N=72)	p-value
Age Mean (sd) Years	31.01 (6.17)	32.10 (6.09)	0.002
Country of birth N(%) Australia Other	658 (71%) 270 (29%)	54 (75%) 18 (25%)	0.46
Relationship status N(%) Married or defacto Other	887 (96%) 41 (4%)	65 (90%) 7 (10%)	0.043
Education N(%) Less than 12 years 12 years More than 12 years	113 (12%) 251 (27%) 564 (61%)	11 (15%) 15 (21%) 46 (64%)	0.45
Aboriginal/Torres strait islander N(%) Yes No	48 (5%) 880 (95%)	6 (8%) 66 (92%)	0.26
Employment status N(%) Unemployed Employed	46 (5%) 882 (95%)	6 (8%) 66 (92%)	0.21
Hours worked each week N(%) 0 to 7 hours 7 to 15 hours 15 to 40 hours More than 40 hours	47 (5%) 5 (1%) 267 (28%) 609 (66%)	6 (8%) 1 (1%) 27 (38%) 38 (53%)	0.13
Smoker N(%) Yes No	258 (28%) 670 (72%)	25 (35%) 47 (65%)	0.21
First time father N(%) Yes No	523 (56%) 405 (44%)	38 (53%) 34 (47%)	0.55

Table 2: Newborn outcomes

Variable	Fathers of term babies (N=928)	Fathers of preterm babies (N=72)	p-value
Induction of labour N(%)			
Spontaneous onset of labour	408 (44%)	21 (29%)	0.039
Induction of labour	312 (34%)	33 (46%)	
No labour (caesarean section)	208 (22%)	18 (25%)	
Delivery mode N(%)			
Spontaneous vaginal delivery	552 (60%)	38 (53%)	0.017
Assisted vaginal delivery	69 (7%)	1 (1%)	
Elective caesarean section	208 (22%)	18 (25%)	
Non elective caesarean section	99 (11%)	15 (21%)	
Newborn gender N(%)			
Male	497 (54%)	40 (56%)	0.74
Female	431 (46%)	32 (44%)	
Birthweight N(%)			
<2500gm	60 (6%)	65 (90%)	<0.0001
>= 2500gm	868 (94%)	7 (10%)	
Need for nursery admission (%)			
Yes	117 (13%)	70 (97%)	<0.0001
No	811 (87%)	2 (3%)	

Table 3: Anxiety, depression and quality of life scores in fathers with preterm babies compared to control.

HADS	Preterm N=72 N(%)	Control N=928 N(%)	P-value
Antenatal			
Total score ≥ 14			
Case	18 (25.0%)	246 (26.5%)	0.78
Non-case	54 (75.0%)	682 (73.5%)	
Anxiety subscale score ≥ 8			
Case	18 (25.0%)	211 (22.7%)	0.66
Non-case	54 (75.0%)	717 (77.3%)	
Depression subscale score ≥ 8			
Case	7 (9.7%)	78 (8.4%)	0.70
Non-case	65 (90.3%)	850 (91.6%)	
SWLS			
Mean (sd)	27.15 (5.17)	27.09 (6.34)	0.73
Postnatal			
Total score ≥ 14			
Case	19 (26%)	192 (21%)	0.24
Non-case	49 (68%)	690 (74%)	
Missing data	4 (6%)	46 (5%)	
Anxiety subscale score ≥ 8			
Case	18 (25%)	134 (12%)	0.02
Non-case	50 (69%)	748 (83%)	
Missing data	4 (6%)	46 (5%)	
Depression subscale score ≥ 8			
Case	11 (15%)	109 (12%)	0.36
Non-case	57 (79%)	773 (83%)	
Missing data	4 (6%)	46 (5%)	
SWLS			
Mean (sd)	27.31 (4.82)	27.88 (5.17)	0.01

Current knowledge on the subject

- Preterm birth is the leading cause of death and disability in children.
- Developmental outcomes of preterm babies are poor when parents have high levels of anxiety and depression.
- Mothers of preterm babies have higher rates of postnatal depression and anxiety than mothers of term babies.
- Less information is known about fathers of preterm babies.

What this study adds

- Fathers reports high levels of anxiety in the third trimester of pregnancy
- Fathers of preterm babies have persisting high levels of anxiety in the postnatal period
- Fathers of preterm babies report lower quality of life than fathers of term babies