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# Risk factors for postnatal depression: a review and risk factors in Australian populations

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## Summary

Postnatal depression affects up to 15% of women in the six months following childbirth. Risk factors for this disorder are predominantly psychosocial. An overview of sociodemographic, early life experiences, external environment, internal environment and obstetric and infant variables are presented in the introduction. Two studies that recruited women shortly after they had given birth and followed up to six months postpartum are used to demonstrate the salience of such risk factors. The importance of clarifying risk factors to postnatal depression are discussed especially in relation to improving our understanding of the mechanisms of postnatal depression, how they may assist in developing preventative strategies and how they can help in planning treatment.

*Keywords*: Postnatal depression; risk factors; psychosocial; personality; epidemiology.

## Introduction

It is now well established that up to 15% of women will suffer an episode of major depression in the six months following childbirth (O'Hara et al., 1996). While postnatal depression was initially considered to be a unique type of depression linked to the changes in reproductive hormones that occur at the time of childbirth (Pitt, 1968), it is now considered to have a clinical picture similar to that of non-psychotic, non-melancholic, major depressive disorder (Cooper et al., 1988; Kumar, 1982). There has been little evidence to support a hormonal aetiology for postnatal depression (Harris et al., 1989), although oestrogen sensitivity may play an important role for some women (Bloch et al., 2000; Gregoire et al., 1996). Recent research has focussed upon a psychosocial model to improve our understanding of the origins of postnatal depression.

A psychosocial model for depression was initially proposed by Brown and Harris (Brown et al., 1978). This model arose from their research on the impact of life events on the onset of depression. In their study of women in London they found that not all women developed depression following adversity (recent negative life events); depression arose among these women with at least one of four vulnerability factors, having 3 or more young children at home, no outside employment, the loss of a mother before age 11 and a lack of a confiding relationship. These factors were not a sufficient cause for depression on their own; the experience of adverse life events was also required for the women to become depressed.

Such a model for depression can be applied equally as well for postnatal depression, in this case childbirth is the provoking life event. This life event then may trigger depression in vulnerable women. Over the past 30 years there has been considerable research conducted to identify such vulnerability factors to postnatal depression. These studies have been summarised into two meta analyses (Beck, 1996; O'Hara et al., 1996) and in one comprehensive literature review (Pope et al., 2000). It is not the purpose of this paper to provide yet another comprehensive review of these risk factors, but rather to provide an overview of these risk factors

and to provide a framework for understanding the origins of postnatal depression. These will then be examined in two studies conducted in Sydney in which we have identified risk factors for postnatal depression.

## Childbirth is a life event

There is no doubt that childbirth is a very significant life event for women. It has an impact on every aspect of a women's life, including her self-concept, social role and the quality of her intimate relationships (Cox, 1988; Paykel et al., 1980; Seguin et al., 1995). It is associated with profound physical and biological changes around the time of parturition all of which will have an effect on her body image. In addition to this there are the demands of looking after a new infant, which has to be balanced with other roles in the woman's life, such as work and managing a household.

## Sociodemographic factors

While sociodemographic factors would at first sight seem to be linked with risk to developing postnatal depression, research evidence is not clear. This is perhaps the result of studies being conducted in relatively homogenous samples, mainly among lower socio-economic groups of women. There are some suggestions that lower socio-economic status, or low income may increase risk (O'Hara et al., 1996), but the strength of the risk is weak. Where studies have been conducted amongst very socially disadvantaged groups, the prevalence of postnatal depression is very high, pointing towards there being markedly increased risk among such populations (Cooper et al., 1999). Age has been variably found to be a risk factor, with higher risk found among adolescents e.g. (Paykel et al., 1980) and among older primiparous women (Dennerstein et al., 1989). It may be that a young age is a proxy-measure for other important psychosocial risk factors.

Links between postnatal depression and marital status (married vs being single) are not clear, with some studies showing an increased risk of postnatal depression among single mothers (Warner et al., 1996), but other studies not supporting this (O'Hara et al., 1996). What is more important is the quality of such relationships; here there is clear evidence that being in a dysfunctional interpersonal relationship, especially where there is a lack of emotional and practical support, increases the risk of developing postnatal depression.

## Early experiences

Women's early experiences, especially the quality of parenting they received, all have an impact on how she will cope when she becomes a mother. There is an increased risk of postnatal depression among women who have experienced poor parenting particularly, a lack of care, e.g. (Boyce et al., 1991b; Coyne et al., 1983). Women who have experienced sexual abuse as a child also have an increased risk of developing postnatal depression (Buist, 1998).

Postnatal depression may, to some extent, be partially genetically determined, although it is not clear whether such vulnerability is directly for depression or to a general liability for psychological distress (Treloar et al., 1999). It may also be the result of "cultural" transmission with the woman's mother's postnatal depression having an impact on the woman such that she is at high risk to develop depression herself.

## Social environment

There are a number of factors within a women's social environment that increase the risk of her developing postnatal depression. The most important of these are the quality of her social ties, whether they be her social relationships or her intimate relationship. There is considerable evidence that a poor quality marital relationship is a robust predict or of postnatal depression (Beck, 1996; Boyce, 1994; O'Hara et al., 1996).

Women who have poor social support networks, particularly in providing emotional support also have an increased risk of developing postnatal depression (Beck, 1996; O'Hara et al., 1996). It should be noted that many women will shift their social network after childbirth and so when they have the new baby they do not have the same access to their social network as previously and this may increase their vulnerability to postnatal depression.

## Internal environment

The women's "internal environment" refers to her psychopathology, personality style and biological functioning. Postnatal depression was initially considered to be a biological disorder because of its close

association with childbirth and the hormonal changes that occur around this time. There has been little evidence to support such a notion other than a recent study showing increased oestrogen sensitivity among women who suffered from postnatal depression (defined according to DSM IV Criteria) (Bloch et al., 2000). Further evidence for such a sensitivity comes from studies that have found that experiencing premenstrual symptoms increases the risk for developing postnatal depression (Dennerstein et al., 1989). This is supported by the studies that have shown that estrogen supplementation may be a useful adjunct for treatment for women with postnatal depression (Gregoire et al., 1996). Other suggestions that it may be related to changing levels of progesterone have not been supported by research evidence. There has also been speculation about the role of thyroid dysfunction in postnatal depression, but this may be limited to women having thyroid antibodies (Harris et al., 2002).

There is very clear evidence that women with previous psychopathology (anxiety or depression) are at increased risk of developing postnatal depression (Beck, 1996; O'Hara et al., 1996). Women who are depressed or anxious during pregnancy also have an increased risk of postnatal depression (Glover et al., 2002; Meares et al., 1976). The blues arising in the first three to five days postpartum also increases the risk of developing postnatal depression as discussed by Henshaw (2003) in this issue of the Journal.

## Obstetric factors

There is very mixed evidence regarding the impact of obstetric variables on postnatal depression, with some studies showing that women who have more obstetric intervention have increased risk of postnatal depression (Boyce et al., 1992; Edwards et al., 1994; Fisher et al., 1997) and other studies not fully supporting this (Murray et al., 1993; O'Hara et al., 1982; Paykel et al., 1980). Of great importance now are women who report having had a traumatic delivery (this includes all delivery types, and is related to the woman's experience of her delivery and is linked to pain, feeling of loss of control and powerlessness and the fear she experiences) who may have increased risk of postnatal depression but also increased risk of developing posttraumatic stress disorder which may mimic postnatal depression (Ballard et al., 1995).

In this paper, risk factors to postnatal depression identified in two studies will be reported on. This is a re-analysis of the data from these two longitudinal studies of cohorts of women followed from childbirth (Boyce et al., 2000; Hickey et al., 1997). The principal aim of the first study was to determine risk factors to postnatal depression "*risk factor study*"; full details can be found in (Hickey et al., 1997). The aim of the second study was to examine women's perceptions about their obstetric care and assess the health outcomes for new mothers "*outcomes study*", details can be found in (Boyce et al., 2000; Johnstone et al., 2001).

## Methods

Both of these studies used a similar methodology in that the women were recruited to participate shortly after they had delivered. Potential participants for the *risk factor* study were a consecutive sample of women delivering at the Nepean hospital (in the west of Sydney) over a three month period. Participants for the *outcomes study* came from the Nepean Hospital and the Central West (Cowra, Dudley and Orange Hospitals) regions of New South Wales, Australia. In each study the participants were women who had given birth to a healthy infant, did not suffer from a psychotic illness or had any major physical health problem and spoke sufficient English to complete the questionnaires.

In both studies women were recruited to participate shortly after they had given birth. They were approached by post-natal ward staff and invited to participate in the study. Demographic details and information about potential risk factors were sought by interview and questionnaires within one week of delivery. Both cohorts of women were followed up for 6 months postpartum. Moreover, in the *risk factor* study women were followed up at six weekly intervals and in the *outcomes study* at eight weeks and six months postpartum.

### *Baseline semi-structured interview*

In both studies the women completed a questionnaire to ascertain social and demographic information about themselves and their partners and families; psychiatric history information from participants and their families. In both studies they completed the Edinburgh Postnatal Depression Scale (EPDS) and the Vulnerability Personality Scale Questionnaire (VPSQ) and a life events scale.

In the *risk factor* study the women were interviewed to elicit: their thoughts and feelings towards the pregnancy, birth and baby; her delivery experience; present intimate relationship; existing social supports (adapted from the Mannheim Interview on Social Support (Veiel, 1990); personal and family psychiatric history and the quality of their key relationships.

## Measures

### *Edinburgh Postnatal Depression Scale*

The Edinburgh Postnatal Depression Scale (EPDS; (Cox et al., 1987)) is a 10-item self-report measure, specifically designed to

assess depression in the postpartum period. Scores greater than 12 indicate a high probability of the women being a case of postnatal depression, with high sensitivity and specificity (Cox et al., 1987; Murray et al., 1990). This scale has been validated in Australia with the Composite International Diagnostic Interview used as their "gold" standard diagnostic instrument. (Boyce et al., 1993).

### *Vulnerable Personality Scale*

The woman's personality style was measured using the vulnerable personality scale questionnaire (VPSQ) (Boyce et al., 2001a). This is a 9-item questionnaire allowing responses on a 5-point Likert scale that identifies two dimensions on personality functioning, labelled a "vulnerability" dimension and the other an "organised/responsive" personality dimension.

### *Life events*

A shortened version of the Tennant and Andrews life events scale (Tennant et al., 1976). A self-report scale comprising 10 relevant life events (e.g., death of a family member or a close friend, moving house, marriage) was used to assess life events; subjects were asked whether each event had happened to her over the past 12 months.

### *Structured Clinical Interview for DSM-III-R*

The Depression and Anxiety sections of the Structured Clinical Interview for DSM-III-R (SCID) (Spitzer et al., 1990) was used to assess whether the women met criteria for DSM-IV major depression in the risk factor study.

## Results

### *Sample*

The 424 women in the *risk factor* study had a mean age of 26.5 years (SD 5.0), and the 490 women in the *outcomes study* had a mean age of 28.0 years (SD 5.2). The majority of women were either married or in a defacto relationship (86.7% in the risk factor study, 84.8% in the outcome study).

The majority of women were multiparous (56.7% and 58.4%), and most women had a vaginal delivery (76.5%).

### *Prevalence of postnatal depression*

The prevalence of postnatal depression in both studies was similar using a cut off score of greater than 12 on the EPDS. In the *risk factor study*, the prevalence rates were 8.9% at six weeks postpartum; 8.9% at 12 weeks postpartum, 10.1% at 18 weeks postpartum and 8.6% at 24 weeks postpartum. In the *outcomes study* the prevalence rate was 13.1% with 64 women scoring above 12 on the EPDS at 8 weeks postpartum and 13.3% at 24 weeks postpartum.

For subsequent analyses, "cases" in the *risk factor study* cases were defined as scoring above 12 on the EPDS on two occasions *and* being diagnosed as suffering from major depression using the SCID. Forty- two women (9.9%) scored above 12 and met the DSM-III-R criteria for major depression when interviewed using the SCID. All of the women who scored above 12 on the EPDS on two occasions met DSM-IV criteria for major depression. In the *outcomes study* the cases were the 64 women (13.1%) who scored more than 12 on the EPDS at eight weeks postpartum.

### *Demographic factors*

Sociodemographic factors that increased risk for postnatal depression were examined first. There were no differences in age between the cases and non cases (26.1 vs. 27.0, $t = 1.12$, NS in the *risk factor study* and 28.0 vs. 28.0, $t = 0.013$, NS in the *outcomes study*). However, when examined categorically, women aged 16 or younger were significantly more likely to be cases of postnatal depression (OR = 14.65 95% CI = 2.38 − 90.38) in the *risk factor study*, whereas none of the women 16 or younger were cases in the *outcomes study*. There was no difference in the number of years of education the women received (Mann-Whitney U = 7519.0, NS). Specifically, there was no increased risk of postnatal depression for the 53 women with less than 9 years of education (OR = 1.2) or for the 40 women with tertiary education (OR = 1.0) in the *risk factor study*. In the *outcomes study* women with postnatal depression were significantly more likely to have had a Technical College Education compared to those who had not complete year 12 (OR = 2.24, CI = 1.18–4.23).

Women, who identified themselves as being unemployed or on an employment benefit, had an increased risk of postnatal depression (OR = 2.7, 95% CI = 0.96 − 7.8) in the *risk factor study*, but this did not reach significance.

Being single, separated or having no partner was non-significantly associated with being a case of postnatal depression (OR = 2.33, 95% CI = 0.83 − 6.54) in the *risk factor study*.

### *Previous psychopathology*

In the *risk factor study* twenty-four (5.7%) women reported a past history of a psychiatric illness. Of the

42 cases of postnatal depression, 8 (19%) reported such a past history (OR = 5.40, 95% CI = 2.1 − 13.5), and 20 (of 136) reported a family psychiatric history (OR = 1.65, 95% CI = 0.87 − 3.13).

There was also an increased risk of developing postnatal depression for those women with a history of psychopathology or familial mental illness (OR = 2.53, CI = 1.43–4.5) in the *outcomes study*. Specifically, women with a past history of depression (OR = 3.21, CI = 1.55–6.58), anxiety (OR = 4.2, CI = 1.77–9.85), or PND (OR = 4.0, CI = 1.77–9.10) had increased risk of developing PND. Increased odds of PND were also associated with the occurrence of depression (OR = 2.83, CI = 1.29–6.15) and PND (OR = 4.41, CI = 1.21–15.52) in the participant's mother. The only other significant familial psychiatric risk factor for PND was a history of alcoholism in the brother of the participant (OR = 5.91, CI = 1.51–22.75).

*Stressful life events*

In both studies the women were given a list of life events at 12 weeks postpartum, and asked if they had experienced any of them over the past twelve months (that is, since they conceived). There was a significant increased risk of postnatal depression associated with having experienced one or more life events (OR = 3.14, 95%, CI = 1.35 − 7.30) in the *risk factor study*. In the *outcomes study* increased risk of postnatal depression was associated with having a major health problem (OR = 2.86, CI = 1.30–6.23) and having arguments with their partner (OR = 4.57, CI = 2.13–5.29).

*Present intimate relationship*

The quality of the women's interpersonal relationship, in particular their overall satisfaction with the relationship, whether he provided emotional support and whether he was easy to talk to was assessed in the risk factor study. Women who reported that their partners were not easy to talk to, were significantly more likely to be a case (OR = 5.34, 95% CI = 1.53–18.71) as were women who reported they did not get emotional support from their partner (OR = 11.62, 95% CI = 1.57–85.55).

Women who reported global dissatisfaction with their relationship with their partner had an increased risk (OR = 3.25, 95% CI = 1.00 − 10.5) of being a case.

*Social supports*

The quality and nature of social support networks was assessed in the *risk factor study*. Women who identified that they were unable to get satisfactory instrumental support in a crisis had a slightly increased risk of postnatal depression (OR = 1.73, 95% CI = 0.87 − 3.44). An even greater risk was associated with women who were unsatisfied with psychological support following a crisis (OR = 2.51, 95% CI = 1.29 − 4.86).

*Personality*

Personality vulnerability was assessed on the vulnerability subscale of the VPSQ. In the *risk factor study* the cases scored significantly higher than the non-cases (16.4 (SD 4.2) vs. 13.2 (SD 4.0), $t = 4.68$, $p < 0.001$); a difference that persisted when the baseline EPDS was partialled out ($F_{(2,404)}$) = 4.44, $p < 0.05$). In the *outcomes study* depressed women (cases) scored significantly higher on the vulnerability scale than the non-cases (18.3 (SD 4.1) vs. 15.5 (SD 4.2), $t = 5.2$, $p < 0.001$).

This was then analysed categorically with women defined as high scorers on the vulnerability scale if they scored more than 1 standard deviation above the mean. High scorers on the vulnerable scale had a significantly, increased risk of being a case in the *risk factor study* (OR = 5.63; 95% CI = 2.80 − 11.36) and in the *outcomes study* (OR = 2.93 1.66–5.17).

## Discussion

In this paper psychosocial risk factors to postnatal depression have been described, and grouped into five domains; sociodemographic; early experiences; social environment; internal environment and obstetric and infant factors. Two studies have been reported on that have supported the salience in three of the domains; early experiences, social and internal environments. Both of these studies used a prospective methodology in that women were recruited into the studies immediately after they had given childbirth. This strategy has been used for convenience reasons and clearly it would have been preferable if the studies had recruited the women early in their pregnancy and followed up. Whilst this might be considered a limitation of the study, particularly when some of the women might have

experienced depression antenatally, the women were assessed prior to the onset of developing depression (postpartum) and so the results from these studies appear to identify risk to subsequent postnatal depression.

In both of the studies the impact of past psychopathology on increasing risk for postnatal depression was clearly demonstrated, with those women. In both studies stressful life events were shown to increase risk especially those related to interpersonal stresses. Personality vulnerability was also increased in both of the studies and in each study a vulnerable personality style was associated with increase risk of subsequently developing postnatal depression. In the *risk factor study* increased risk was associated with a poor quality interpersonal relationship. Sociodemographic factors were variably associated with postnatal depression in both of the studies, in agreement with the previous literature which has been inconsistent in reporting sociodemographic factors such as age, marital status, employment status as being risk factors. This would suggest that the likelihood of sociodemographic factors increasing risk to postnatal depression is probably related to the population used for the particular study and, as such, are not robust risk factors to postnatal depression.

Studies assessing risk for postnatal depression are of importance for three reasons; to improve our understanding of the mechanisms by which women become depressed; suggesting strategies for prevention; and in helping treatment.

It is well recognised that childbirth is a major life event that has an impact on all domains of a woman's life and will have an impact on a woman's coping abilities. Women who have a previous history of depression or anxiety will have poor coping abilities as demonstrated by their becoming depressed or anxious previously. Their coping skills will be stretched considerably by the stresses of childbirth, and as they have done previously, will become depressed in the postpartum period. At times after life stress one crucially important way of coping is to make use of the buffering effect of social networks (Alloway et al., 1987). It therefore makes sense that women who report their social networks as being deficient have an increased risk of developing postnatal depression following childbirth. This is particularly the case for the woman's most intimate relationships where women will look to their partners to provide both emotional and instrumental support. When such support is not provided her capacity to cope with the demands of her new infant will be stretched and her self-esteem undermined leading to her becoming depressed. Women with a vulnerable personality style (characterised by worrying about interpersonal relationships, anxiety and lack of assertiveness (Boyce et al., 1991a; Boyce et al., 2001b) are clearly also at risk of developing postnatal depression as their coping mechanisms will be poor because of their high levels of anxiety associated with their personality.

Clarification of risk factors will assist in treatment planning for postnatal depression. The factors that increase risk of postnatal depression will also maintain her depression. Dealing with these risk factors should be an important component in the treatment of postnatal depression. For example, a woman whose depression is related to having an unsupportive partner will need his support so that she can recover from her depression; this therefore should be a focus for intervention such that she is able to get increased support from her partner. Similarly if she has a vulnerable personality style, her treatment should deal with her vulnerability and help her improve her coping skills using psychotherapeutic strategies such as cognitive behaviour therapy or interpersonal therapy.

One of the best ways to deal with postnatal depression is to prevent it happening in the first place. Pregnancy would seem to be an ideal time to start to implement preventive strategies for postnatal depression given the contact that women are having with health professionals during the course of their pregnancy. A number of strategies have been proposed for preventive interventions (Lumley et al., 2001; Stuart et al. in this journal) however, these have so far not demonstrated significant effects, possibly because they use some form of universal intervention. It may be that prevention of postnatal depression has been much more specifically targeted towards the woman's particular vulnerability. Such an approach would mean that a woman's vulnerability should be assessed during the course of her pregnancy; identification of the vulnerability factors would then become an important basis on which to plan a preventive intervention. For example, if she has experienced past episodes of depression or anxiety, ensuring that these are fully remitted and that symptoms are aggressively treated should they start to arise again will be important aspects of prevention. If she reports her partner is unsupportive, this must be addressed during the

course of pregnancy to put the relationship on a more stable footing, so that she is able to have the appropriate support when the baby has been born. It is also a time to set-up appropriate social networks if she reports her social network as being poor. For women that have a vulnerable personality style strategies to provide stress inoculation or modification of personality style could be started during the course of her pregnancy and thereby reduce her risk of becoming depressive subsequently.

In summary, clarification of psychosocial risk factors to postnatal depression is important in understanding the mechanisms by which a woman may become depressed, can suggest possible prophylactic interventions and provide guidance as to effective treatment.

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