

Childbirth: Life Event or Start of a Long-Term Difficulty? Further Data from the Stoke-on-Trent Controlled Study of Postnatal Depression

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Background. This paper reports further data from the Stoke study of postnatal depression and examines whether psychosocial characteristics and symptom profiles differ between postnatal and control depression.

Method. Two hundred and thirty-two postnatal and non-postnatal control women were screened with the Edinburgh Postnatal Depression Scale; all high scorers and a sample of low scorers were interviewed with the Standardised Psychiatric Interview and modified Social Maladjustment Schedule. Depression was diagnosed using the Research Diagnostic Criteria.

Results. Postnatal but not control depression was associated with a poor relationship with the woman's own mother and greater occupational instability. Depression in control women was associated with low income, having three or more children, performing manual work and occupational dissatisfaction, but postnatal depression was not. There were no differences in the symptom profiles of the postnatal and control women nor between early and late onset postnatal depression.

Conclusion. Depression is a common and socially disabling disorder affecting mothers of young children. Postnatal depression is more contingent on acute biopsychosocial stresses caused by the arrival of a new family member. Depression in women with older children is more closely related to longer term social adversity.

The Stoke study of postnatal depression (Cox *et al*, 1993) found a 6-month period prevalence of depression in postnatal and control women but a three-fold higher rate of onset of depression in the first 5 weeks following delivery compared with the equivalent time period for control women. In this report we examine whether the psychosocial characteristics and symptom profiles associated with depression differ between postnatal and control groups, and between 16 women who experienced an early onset compared with later onset postnatal depression.

These questions are important because Kumar & Robson (1984) argue that childbirth *per se* has a "particular and deleterious effect on the mental health of a substantial proportion of first time mothers", which is supported by Martin *et al* (1989) who found postnatal depression less contingent on social stress than antenatal depression. Others (Paykel *et al*, 1980; Watson *et al*, 1984) have suggested that the childbirth event itself is only partly responsible for depression. Paykel *et al* (1980) suggested that childbirth exerts a small additional stress in a tenuous situation rather than being a major cause of depression. If this is so, then the psychosocial characteristics and symptom profile of depression in non-pregnant non-puerperal women might be similar if not identical to those of postnatal depression.

Method

The methodology of the study was fully described in our previous paper (Cox *et al*, 1993) and is therefore summarised here.

The postnatal women were recruited from the North Staffordshire Maternity Hospital. The control group (non-pregnant, no births in previous year) was recruited from general practice age/sex registers and matched as closely as possible with a postnatal subject for age (within 5 years), marital status and number of children.

Social data were collected using a modified version of the Social Maladjustment Schedule (SMS) (Clare & Cairns, 1978). This is a 26-page interview that we modified by omitting items not applicable to many subjects (e.g. solitary living) and others less relevant to this area (e.g. housing conditions, which are relatively uniform in North Staffordshire compared with London where the interview was developed) and by obtaining more detail on family and social interactions to allow separate analysis of relationship with each parent of the interviewee. The modifications were piloted on 20 subjects for acceptability. The interview covered six domains:

- (a) housing (residential stability and management of housekeeping);
- (b) occupational and social role (occupational stability, satisfaction with occupational/social role);
- (c) economic situation (annual income);
- (d) leisure and social activities (opportunities for, extent of and satisfaction with leisure activities and extent and satisfaction with social contact);
- (e) family relationships (extra detail on interaction with relatives, separately assessing interaction with mother, father and siblings, and satisfaction with parental role); and
- (f) marriage (sharing of interests and activities, sharing of responsibilities and decision making, satisfaction with marital harmony, satisfaction with sexual compatibility and fertility and family planning).

We also collected demographic data (age, marital status, number of children) as well as asking about place of birth, level of education, previous pregnancies, past psychiatric treatment and family psychiatric history, employment status, duration of unemployment, hours worked, days missed from work, coping at work, partner's employment, partner's age, financial difficulties, number of outdoor tasks (e.g. shopping, school run), ability to drive and access to a car.

The psychiatric instruments used were the Edinburgh Postnatal Depression Scale (EPDS) (Cox *et al*, 1987), the 28-item General Health Questionnaire (GHQ-28) (Goldberg & Hillier, 1979) and the Standardised Psychiatric Interview (SPI) (Goldberg *et al*, 1970). Two items assessing anhedonia and appetite were added to the SPI to facilitate diagnosis of depression according to Research Diagnostic Criteria (RDC) (Spitzer *et al*, 1978). In addition to the SPI item on somatic symptoms, we enquired about specific somatic symptoms of anxiety (somatic anxiety).

The EPDS was sent by post for women to complete without consulting relatives. All who scored 9 or above and a sample of low scorers (EPDS score 0–8) were selected for a subsequent home interview. At the interview the SMS and the SPI were administered by D.M. or G.C. and two self-report scales were completed, the GHQ-28 and a repeat EPDS.

The analysis of categorical data was carried out using the StatXact-Turbo package, which gives exact *P*-values even when data are sparse; χ^2 tests were used for nominal categories and Mann–Whitney tests for ordinal data. The statistical package Number Cruncher Statistical System (NCSS) was used for *t*-tests on continuous data and for the multivariate

comparisons. The matching is used to produce a sample of general population women similar to the postnatal group; the analysis of variables' relationship with depression was carried out independently for postnatal and control groups, an approach adopted by O'Hara *et al* (1991) in their controlled study. Stepwise discriminant analysis was carried out to obtain the best set of associated variables but does not imply that omitted variables are not individually associated with depression. Individual item analyses are also reported for this reason and for comparison with previous research.

Results

Of the 251 postnatal women sent the EPDS, 243 returned the questionnaire. The EPDS was returned by 238 controls. Fourteen selected control women could not be traced so were replaced, as were controls subsequently found to be pregnant. Eight control women who refused to participate were not replaced. Attrition rates were low and are detailed in Cox *et al* (1993). Those women in either the postnatal or control group whose identified 'partner' in the other group did not return the EPDS were excluded leaving a sample of 232 matched pairs. Of the 147 postnatal women selected for interview (96 high and 51 low EPDS scorers), 137 interviews were completed and 129 of these are in the 232 matched pairs. Of the 156 control women selected for interview (106 high and 50 low EPDS scorers) 140 interviews were completed and 136 of these are in the matched pairs.

Although the control women were slightly older (postnatal women 25.4 v. control women 27.2 years, $P=0.001$) the matching was satisfactory (Cox *et al*, 1993). Not only were marital status and number of children (matched as closely as possible) almost identical but so was social class (of partner), which was not part of the matching process.

Psychosocial factors

Data analysis was carried out independently for index and control women. The results are reported for psychosocial factors significantly associated with depression in the index or control women, and for factors associated with depression in both groups.

Age and marital status were not associated with depression in either group. Performing manual work, having three or more children and having a previous or family history of psychiatric disorder were associated with depression in the control group but not in the postnatal group (Table 1).

Social factors, as measured with the SMS, and their correlations with depression are shown in

Table 1
Background factors associated with postnatal and control depression

	Postnatal			Control		
	Non-depressed	Depressed	<i>P</i>	Non-depressed	Depressed	<i>P</i>
Mean age (<i>n</i>)	25.4 (108)	25.4 (21)	0.99	27.7 (117)	25.6 (19)	0.09
Married/cohabiting	176 (83%)	17 (81%)	0.4735	178 (84%)	13 (68%)	0.24
Manual work	15 (43%)	2 (50%)	0.99	31 (42%)	7 (89%)	0.0219
More than three children	21 (19%)	6 (29%)	0.3823	15 (13%)	7 (37%)	0.0157
Previous psychiatric treatment	20 (19%)	5 (24%)	0.3711	27 (23%)	12 (63%)	0.008
Family psychiatric history	46 (43%)	10 (48%)	0.8109	50 (44%)	13 (68%)	0.0454
Mean monthly income (<i>n</i>)	£752 (102)	£687 (20)	0.45	£784 (115)	£557 (17)	0.015

Means: Student's *t*-test; categories: exact χ^2

Table 2
Social factors associated with postnatal and control depression¹

	Postnatal	Control
Occupational stability	0.02	0.99
Housekeeping difficulties	0.0001	0.001
Dissatisfaction with social role	0.03	0.0178
Leisure and social activities	0.0001	0.0001
Occupational dissatisfaction	0.3685	0.0125
Difficulties with outdoor tasks ²	0.004	

1. Direction of association: RDC depression was associated with higher indices of dysfunction or dissatisfaction. All figures are Mann-Whitney *P*-values.
2. Controls had too few difficulties for analysis.

Table 2. A single category of 'leisure and social activities' was obtained by combining the following SMS items: opportunities, extent and satisfaction with leisure activities and extent and satisfaction with social contacts. Restriction of leisure and social activities, housekeeping difficulties and dissatisfaction with social role are associated with depression in both index and control women.

Occupational dissatisfaction (in a disliked job with dissatisfaction ranging from mild to planning to leave) and low monthly income was associated with control but not postnatal depression, while occupational instability (had to leave a job against preference) was associated with postnatal but not control depression.

Table 3 shows associations between measures of interpersonal relations and depressions. The items from the SMS on marital relationship were combined to produce a single category, 'marital disharmony'; this variable was associated with depression in both groups. The variables 'relationship with mother' and 'relationship with father' were obtained by combining opportunities for, extent of and satisfaction with interaction with each parent. A poor relationship between the woman and her mother was significantly

Table 3
Interpersonal relationships and depression

	Postnatal	Control
Poor relations with mother ¹	0.0004	0.1955
Poor relations with father ¹	0.0004	0.004
Poor relations with siblings	0.0017	0.008
Marital disharmony ¹	0.001	0.0002
Satisfaction with parental role ¹	0.0004	0.0005

1. Direction of association: RDC depression was associated with higher indices of dysfunction or dissatisfaction. Figures are all Mann-Whitney *P*-values. Factors not associated with depression in either group were place of birth, level of education, months living in present accommodation, residential stability, hours worked per week, days missed from work, coping at work, unemployment, duration of unemployment, partner's age, partner working class, partner being unemployed, agreement with partner on fertility and family planning, previous miscarriage, previous termination of pregnancy, financial difficulties (*P*<0.1 in controls), number of outdoor tasks in the last 7 days (*P*<0.1 in postnatals), not having a car, being a non-driver.

associated with depression in the postnatal women but not in the control women. An adverse relationship with the father was associated with depression in both groups.

Stepwise discriminant analysis was carried out to obtain the best set of associate variables. For the postnatal group three variables were chosen (in order of importance): difficulties with housekeeping (*P*=0.002), occupational stability (*P*=0.0089) and marital disharmony (*P*=0.0977). In the control group four variables were chosen (in order of importance): previous psychiatric treatment (*P*=0.0039), marital disharmony (*P*=0.0131), occupational dissatisfaction (*P*=0.0203) and leisure and social activities (*P*=0.0486). These were all found individually to be good predictors of depression.

Symptom profiles

Comparison of the SPI symptom profiles of the depressed women in the postnatal and control groups

Table 4
SPI symptom profiles of postnatal and control women who had RDC major or minor depression at interview. Symptoms were rated 0–4

	Modal symptom score (no. with that score)		P (Mann-Whitney)
	Postnatal (n = 19) ¹	Control (n = 17) ¹	
Somatic symptoms	2 (10)	2 (7)	0.9
Excessive concern with bodily functions	0 (12)	0 (13)	0.5
Somatic anxiety	0 (11)	0 (8)	0.9
Fatigue	2 (13)	2 (10)	0.5
Sleep	2 (8)	0 (5)	0.2
Irritability	2 (14)	2 (14)	0.3
Concentration	1 (8)	2 (9)	0.5
Depressed mood	2 (16)	2 (16)	1.0
Depressed thoughts	1 (12)	1 (13)	0.8
Anxiety	2 (10)	2 (8)	0.9
Phobias	0 (11)	0 (8)	0.9
		1 (8)	
Obsessions/compulsions	0 (10)	1 (9)	0.9
Anhedonia	2 (10)	2 (9)	0.8
Appetite	0 (12)	0 (8)	0.7
Manifest depression	2 (14)	2 (7)	0.3
Manifest tension	0 (10)	0 (10)	0.8

1. There were 21 postnatal and 19 control women depressed at interview. Only two of these were direct matched pairs. Therefore, these were excluded allowing analysis of the remainder using the Mann-Whitney test for unmatched data. Other SPI-manifest items had few ratings of 2 or more.

showed no significant difference (Table 4), and a similar comparison between the 16 early-postnatal-onset depressions (in which hormonal factors are often invoked as aetiological agents) and the nine later-onset depressions showed no significant differences either.

Review of the interview schedules showed no differences in the severity of depression in either group nor indeed a marked contrast in the content of depression. Some postnatally depressed women were preoccupied with worries about their baby: "Is he still alive?", "What have I let myself in for?" In other postnatal women, however, the content of the depressed thoughts was not related to the birth of the baby. For example, one woman became acutely depressed following a termination of pregnancy at 5 months post-partum. The longer-standing postnatal depressions were related to long-term difficulties, e.g. severely hypochondriacal husband with pathological jealousy who was a fanatical clock collector, depression dating back to the death of an alcoholic mother in a road traffic accident 4 years previously. Similarly, the control women presented with a range of anxieties and depressed thoughts some of which related to their children, in one instance to a pregnancy

17 months earlier. Interestingly, depression in three of the control women had commenced following deliveries 2–3 years prior to the study.

Discussion

When interpreting the results of this controlled study of the psychosocial correlates of postnatal depression, it must be remembered that the data are retrospective and that the researchers were aware at interview which subject was in the postnatal or control group. Nevertheless, the strength of the study is that the same assessment procedure was applied by the same researchers to women sharing the same physical, social and cultural environment and that very few women refused to participate. The key difference between the groups was the recent arrival of a new baby in the postnatal group. The control women were slightly older, as it was likely that women with children over one year old would on average be older than those with a 6-month-old baby. This difference would have little effect on results or conclusions. Because the postnatal and control women are so similar, it is likely that any differences found between the groups are due to childbirth and the presence of the new baby.

The finding of no association between postnatal depression and either social class or parity is similar to the majority of studies reviewed by O'Hara & Zekoski (1988) and since confirmed by Gotlib *et al* (1991), Stein *et al* (1989) and Martin *et al* (1989). O'Hara *et al* (1991) also found no association of depression with socioeconomic status in either their postnatal or control groups.

By contrast, depression in our control women was associated with established general population risk factors, including performing manual work, having three or more children and a low income. These findings therefore echo the classic research on deprived women in Camberwell (Brown & Harris, 1978) and are similar to the findings of Martin *et al* (1989). Interestingly, the vulnerability factors of Brown & Harris (1978) were not replicated by Solomon & Bromet (1982), but the semi-rural Pennsylvania women they studied all had a baby less than 2 years old and so were not unlike our postnatal women, a factor that might contribute to this apparent discrepancy.

Our finding of no association between a past psychiatric history and postnatal depression is similar to Pitt (1968) and Kumar & Robson (1984) but differs from others (Martin, 1977; Paykel *et al*, 1980; O'Hara *et al*, 1983; Watson *et al*, 1984). The most notable contrast, however, is with O'Hara *et al* (1991) who found postnatal but not control depression to

be associated with a previous history of depression. Their method differed in that they used the RDC to establish lifetime diagnosis of depression, which would include untreated episodes, in contrast to our definition of past psychiatric history as treatment (from general practitioner, psychiatric out-patient department or as in-patient for any psychiatric disturbance) or history of parasuicide. Another possible explanation for this finding is that the depressed control women, when reporting their past psychiatric history, included episodes of treatment for postnatal depression which had resolved. Conversely, this is also a possible explanation for Kumar & Robson's (1984) finding of no such association in their London study, in which only primiparous subjects were studied and who would therefore not have had a past history of postnatal depression.

The absence of an association between postnatal depression and family psychiatric history is similar to the findings of Kumar & Robson (1984) but differs from Watson *et al* (1984) and O'Hara *et al* (1984). This pattern is more difficult to interpret. A negative family history might imply a lesser genetic component in postnatal than control depression. It does not necessarily exclude consideration of biological aetiological factors analogous to those found in affective psychosis, such as the increased sensitivity of dopamine receptors, possibly triggered by the sharp fall in oestrogen concentrations after delivery (Wieck *et al*, 1991). However, in O'Hara *et al*'s (1991) controlled study, depression in a first-degree relative was not associated with depression in either postnatal or control (determined by RDC).

The explanation for postnatal but not control depression being associated with occupational instability (having to leave or change employment against preference) is that such a change is likely to be a more active influence in the postnatal than the control women. By contrast, occupational dissatisfaction was associated with depression in the control (but not postnatal) group – these women may have had to remain in a job they did not like but with no 'excuse' to give it up. Some postnatal women may have decided to take the opportunity to leave an unsatisfactory job to look after their new baby. Depressed women in both groups were more likely than non-depressed to experience difficulties with housekeeping, dissatisfaction with social role and restriction of leisure and social activities.

Although most interpersonal relationships, including the marital relationship, were more problematic in depressed women in both groups, the factor that distinguished the postnatal from the control women was their relationship with their own mother. This was impaired in the postnatally

depressed women but not in the control women. Such an association with postnatal depression was not found by Paykel *et al* (1980) but has been found previously (Nilsson & Almgren, 1970; Uddenberg, 1974). Kumar & Robson (1984) found a similar association for postnatal but not antenatal depression and Gotlib *et al* (1991) found an association between perceived early poor parenting on the Parental Bonding Index (Parker *et al*, 1979) and postnatal depression. It seems likely that the relationship between the woman and her mother is an important contributory factor in postnatal depression.

This finding may partially account for the therapeutic effect of health visitor counselling for postnatal depression (Holden *et al*, 1989) and the benefits of volunteers working with disadvantaged families (Johnson *et al*, 1993). Such interventions could be seen as replacing the practical and emotional support that these women would have expected from their own mother.

The similarity of symptoms in postnatal and control depression was even more marked than that reported by Cooper *et al* (1988) who had found differences on three of the Present State Examination (PSE; Wing *et al*, 1974) syndromes in the 6-month postnatal assessment compared with a general population group of women. We confirm their overall conclusion that symptoms are not a distinguishing characteristic of postnatal depression, although Whiffen & Gotlib (1993) found symptom severity the only factor that differentiated postnatal from non-postnatal depression. Nonetheless, our results suggest that depression is indeed a common and socially disabling disorder affecting mothers of young children, with many similarities between postnatal and non-postnatal women.

However, there are important differences. Postnatal depression is more contingent on acute biopsychosocial stresses caused by the arrival of a new family member, with its attendant upheavals including interruption of work outside the home, and is more likely to occur if there is a difficult relationship between the woman and her mother. Depression in women with older children is more closely related to longer-term social adversity and deprivation, low income, three or more children, manual work, dissatisfaction with work.

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