Life events, social support and depression in childbirth: perspectives from a rural community in the developing world

A. RAHMAN,[1] Z. IQBAL AND R. HARRINGTON

From the School of Psychiatry and Behavioural Sciences, University of Manchester; and Human Development Research Foundation, Islamabad, Pakistan

ABSTRACT

Background. High rates of depression associated with childbirth have been reported in many parts of the developing world. However, the prevalence and associations of antenatal and post-natal depression in the rural population remain unknown. Disability associated with depression and its impact on infant health and development could have important public health implications for many developing countries where large proportions of the population are rural.

Method. All women living in southern Kahuta, Pakistan, in their third trimester of pregnancy were interviewed at 6 weeks before delivery ($N=632$) and again at 10–12 weeks after delivery ($N=541$), using WHO Schedule for Clinical Assessment in Neuropsychiatry (SCAN), Personal Information Questionnaire (PIQ) and Brief Disability Questionnaire (BDQ).

Results. The point prevalence of ICD-10 depressive disorder was 25% in the antenatal period and 28% in the post-natal period. Depressed mothers were significantly more disabled, had more threatening life events, and poorer social and family support than non-depressed mothers. Vulnerable mothers were more likely to be depressed during pregnancy, rather than have an onset in the post-natal period.

Conclusion. Over one-quarter of mothers in a rural sub-district of Pakistan suffer from depression shortly before and after childbirth. Rapidly changing traditional family structures and practices may be increasing the risk of depression in many women. Recognizing and treating depression should be initiated during the antenatal, rather than post-natal period.

INTRODUCTION

Epidemiological studies have reported increasingly high rates of post-natal depression in diverse cultures across the developing world. An early pioneering study by Cox (1979) in a semirural Ugandan tribe found rates of 10% based on the ICD-8 criteria. More recently, a community study by Cooper *et al.* (1999) found rates of 34·7% in a peri-urban settlement in South Africa, while hospital-based studies found rates of 23% in Goa, India (Patel *et al.* 2002) and

15·8% in Dubai, United Arab Emirites (Ghubash & Abou-Saleh, 1997). Risk factors identified include previous psychiatric problems, life events in the previous year, poor marital relationship, lack of social support and economic deprivation. Female infant gender was found to be an important determinant of post-natal depression in India, but not in South Africa. Importantly, post-natal depression was found to be associated with high degrees of chronicity, disability and disturbances of mother–infant relationship.

Numerous studies carried out in developed countries provide compelling evidence that post-natal depression is associated with long-term

emotional, cognitive and intellectual problems in children (Cooper & Murray, 1998). There is some evidence that in developing countries, poor maternal mental health may also be associated with malnutrition and poor physical health in infants (Rahman *et al.* 2002). Possible higher prevalence of post-natal depression in mothers of female children could mean that a cycle of poor psychological and physical health in many females is perpetuated from birth, contributing to poor health of future generations. Post-natal depression is therefore likely to have important public health consequences in the developing world.

More than 60% of the population in developing countries lives in rural areas but the prevalence and associations of post-natal depression in this population remain unknown. The sample for such a study would need to be community-based because many women in rural areas do not attend health facilities for antenatal care, and would be missed if hospital-based samples were recruited. Furthermore, while post-natal depression is considered common and its recognition and treatment emphasized, depression during pregnancy has been relatively neglected. Studies in developed countries suggest that depressed mood during pregnancy may be associated with poor attendance at antenatal clinics, low birth weight and preterm delivery (Pagel *et al.* 1990; Hedegaard *et al.* 1993). In developing countries such as Pakistan where infant mortality rates are high, this association may assume added significance. This study aimed to investigate a large rural community-based sample for the prevalence of antenatal and post-natal depression and its association with life events, family relationships and social support, and other psychosocial and economic factors.

METHOD

Study area

The study was done in Tehsil Kahuta, a rural sub-district, 60 km south-east of Rawalpindi. Kahuta has an area of 1096 km², a population of 313 200 and consists of four Administrative Circles (Government of Pakistan, 1999). The average household consists of 6·2 members. Most families depend on subsistence farming, supported by earnings of one or more of the adult male members serving in the armed forces or working as government employees, semi-skilled, or un-skilled labourers in the cities. Kahuta typifies the state of under-development in most of South Asia's rural areas. Unemployment rates are estimated to be 36%, mainly due to the high population growth rate (2·7%), modernization in agriculture, and lack of non-agricultural jobs. Male and female literacy rates are 80% and 50% respectively. The infant mortality rate is 84 per 1000 live births. There are 20 basic health units and two rural health centres, consisting of 28 doctors, 12 midwives (female health visitors, providing obstetrical care), 15 vaccinators (providing immunization), and 120 female primary health workers (Lady Health Workers (LHWs), providing mainly basic mother and child health care). There are a number of private medical practitioners.

Subjects and sampling

The current study was carried out in two adjoining administrative circles in southern Kahuta (Kallar Syedan QH and Choha Khalsa QH), comprising of 10 union councils (the smallest rural administrative unit, each consisting of 5–12 villages). The sample comprised of all physically healthy women aged 17–40 years in their third trimester of pregnancy, recruited from all 10 union councils over a 4-month period (September to December 2001). This was achieved using a number of strategies. First, LHWs were approached to provide lists of all women in the third trimester of pregnancy in their respective areas (it is an official task of LHWs to record all pregnancies). Secondly, in some areas where there were no LHWs, Vaccinators were asked to provide lists of women who had been given tetanus toxoid in the fifth month of pregnancy. Thirdly, traditional birth attendants and private practitioners were paid a small amount to identify such women under their care. Finally, to ensure that no women had been missed, a local person from each village was employed to enquire about any pregnancies in the last trimester.

The Research Ethics Committees of University of Manchester and Rawalpindi Medical College approved our study. It was conducted according to good clinical practice and the declaration of Helsinki.

Data ascertainment

Assessment of post-natal depression

The mothers were interviewed on recruitment (average 6 weeks before expected date of delivery) and 10–12 weeks after delivery, by one of two clinically experienced and trained mental health professionals (A. R. and Z. I.). The same interviewer interviewed each mother on both occasions. Women with a psychotic disorder, learning disability or chronic physical illness were excluded. Maternal depression was assessed using the Schedule for Clinical Assessment in Neuropsychiatry (SCAN) (World Health Organization, 1992), a semi-structured interview for the diagnosis of psychiatric disorder. The interview schedule was translated and culturally adapted after key-informant interviews with the target population, structured focus group discussions with mothers to obtain better cultural understanding of difficult concepts and translation and back-translation by a panel of experts. Interviews were conducted after high inter-rater reliability (kappa = 0·91) had been established. ICD-10 diagnoses (World Health Organization, 1993) of depressive disorder were generated through the SCAN interview.

Assessment of life events and social factors

Life events and sociodemographic variables (age, education, employment, family structure and composition and social support) were assessed by the same interviewers using a specially designed Personal Information Questionnaire (PIQ). Items relating to life events and difficulties were derived from the Life Events and Difficulties Schedule (LEDS) (Brown & Harris, 1989), a semi-structured instrument that explores events and difficulties in the previous year. LEDS has been translated and culturally adapted for use in the study area (Husain *et al.* 2000). Based on the data from this study, 10 areas that accounted for majority of the events and difficulties reported in that population were used in a modified semi-structured interview. Only those events and difficulties were rated as categorically present that were found to be contextually severe after discussion with the local LHW (who lived in the same community and had intimate knowledge of the families being studied).

Disability in mothers was assessed using the Brief Disability Questionnaire (BDQ). This is an 8-item questionnaire that rates current problems in carrying out daily activities on a scale of 0 (not at all) to 2 (definitely), with a maximum score of 16. This instrument has been validated in a 15-centre cross-national, multi-lingual study (Von Korff *et al.* 1996). Socio-economic status was assessed by two methods: objective assessment was done by enquiring about husband's average monthly income; subjective assessment was carried out by the LHWs. They rated each family's socio-economic situation, relative to overall prosperity in the sub-district, on a five-point Likert scale ranging from 1 (richest) to 5 (poorest). All instruments were translated and culturally adapted using the procedure described above.

The data were coded, inputted and analysed using the STATA 7 statistical package (Stata-Corp, 2001). Following a descriptive analysis, univariate analyses (relative risk, Fisher's two-sided exact *P*) was performed between potential risk factors and post-natal depression. Associations were considered significant at the 1% level. The simultaneous effects of significant risk and protective factors on post-natal depression were analysed using logistic regression analysis.

RESULTS

Sample characteristics

Seven hundred and one mothers in their last trimester of pregnancy (average 6 weeks from delivery date) were approached for recruitment. 31 mothers (4%) refused to take part; 35 (5%) suffered from a physical disorder and three women had learning disability and were excluded. Thus, 632 women were interviewed for an evaluation of their mental state and life events in the previous year. Their average age was 26 years (s.d. = 4·9); all were married, average age of marriage being 21 years (s.d. = 3); 47% were uneducated, 30% had primary education while most of the remaining had studied until 10th Class (matriculation); only 3% were employed outside the home. Eighteen per cent were primigravid; 20% had one child; 20% two children; and the remaining 42% had three or more. Twenty-six per cent lived in nuclear families (parents and children only) while the remaining lived in extended families (three

Table 1. *Life events in the previous year as risk factors for depression in the antenatal period*

Risk factor	Non-depressed (N=472) N (%)	Depressed (N=160) N (%)	Relative risk	95% CI
Significant other made reduntant	31 (7)	28 (18)	2·1	1·6–2·8**
Financial difficulties	14 (3)	12 (7)	1·8	1·2–2·8**
Housing difficulties	40 (8)	33 (20)	1·9	1·4–2·6**
Major arguments, relationship difficulty	19 (4)	30 (19)	2·7	2·0–3·5**
Serious marital problems	5 (1)	12 (8)	2·9	2·0–4·1**
Bereavement	99 (21)	42 (26)	1·2	0·9–1·7
Major illness in family	141 (30)	59 (37)	1·3	0·9–1·7
Social role change	178 (38)	70 (44)	1·2	0·9–1·5
Problems with the law	3 (0·6)	4 (2·5)	2·2	1·0–4·2
Lack of friend or confidant	133 (28)	40 (25)	0·9	0·6–1·2

** $P < 0.01$, Fisher's two-sided exact test (all other P values non-significant).

generations, or one or both parents with married sons, their wives and children). Ninety-one per cent of the fathers were employed; about 25% remained absent from home for 6 months or more due to employment in the cities. The average monthly family income was 2500 rupees (US$ 42); 67% of the families were rated <3 on the 5-point socio-economic scale by the LHWs.

Out of these 632 mothers assessed prenatally, 25 (4%) (4 cases and 21 non-cases) moved residence and 29 (4·5%) (6 cases and 23 non-cases) dropped out. Two mothers died from birth complications; 32 (5%) had stillbirths or neonatal deaths and three newborns suffered from congenital problems. The remaining 541 (86%) mothers were reassessed 10–12 weeks after giving birth. Of these, 61% had delivered at home with a traditional birth attendant, majority (94%) without any reported complications. Fifty-two per cent mothers gave birth to girls and 48% to boys.

Prevalence of depression in the antenatal and post-natal period

Out of 632 mothers assessed antenatally, 160 (25%) were diagnosed with ICD-10 depressive episode. Out of 541 mothers assessed post-natally, 151 (28%) were diagnosed with ICD-10 depressive episode. Twenty-two mothers (4%) developed a *de novo* depressive episode in the post-natal period, while 8 (1·5%) who had depression in the antenatal period recovered. Depressed mothers scored higher on the BDQ (mean score 6·8, 95% CI 6·3 to 7·4) compared to non-depressed mothers (mean score 1·6, 95%

CI 1·5 to 1·8), the difference being highly significant ($t = 20·6$, df $= 458$, $P < 0.01$).

Associated factors

Risk and protective factors for post-natal depression along with their effect measures are summarized in Tables 1 and 2.

Life events (Table 1)

Events and difficulties of the previous year associated with antenatal depression include an earning member of the family (usually the husband) being made redundant, financial difficulties, housing problems, serious argument or relationship difficulties with a significant member of the extended family and serious marital problems. No associations were found with bereavement, major illness in the family, social role changes, problems with the law or lack of a confiding relationship.

Social support and family factors (Table 2)

There were no associations between depression (antenatal and post-natal) and older age group ($\geqslant 30$). Depression was associated with the presence of two or more children under the age of seven, or two or more girl-children. However, in women with two or more girl-children already, giving birth to a male baby did not reduce the risk of post-natal depression*.

Table 2 also shows that support by the extended family was negatively associated with depression: practice of the traditional '*chilla*' ritual (post-delivery confinement of mothers for a period of 40 days, when all responsibilities

Table 2. *Psychosocial risk and protective factors for depression in the post-natal period*

Risk or protective factor	Non depressed (N=390) N (%)	Depressed (N=151) N (%)	Relative risk	95% CI
Older age (⩾30)	106 (27)	52 (34)	1·2	0·9–1·7
Having ⩾2 children under 7	203 (52)	107 (71)	1·8	1·3–2·4**
Having ⩾2 girl-children	61 (15)	46 (30)	1·8	1·4–2·3**
Able to complete 'chilla' period†	249 (90)	69 (71)	0·4	0·3–0·6**
Daily support in childcare by at least one family member	319 (82)	98 (65)	0·5	0·4–0·7**
Living in extended family	302 (78)	94 (62)	0·6	0·4–0·8**
Infant's grandmother lives with family	302 (78)	95 (62)	0·6	0·5–0·8**
Illiteracy	222 (57)	69 (46)	0·8	0·6–1·0
Husband				
Illiterate	49 (12)	34 (22)	1·6	1·2–2·2**
Unemployed	27 (7)	21 (14)	1·7	1·2–2·4**
Away for >6 months†	87 (24)	30 (22)	0·9	0·7–1·3
Income <Rs. 2500†	49 (16)	19 (13)	0·9	0·6–1·3
Poverty (<3 on 5-point scale)	252 (65)	110 (73)	1·4	0·9–1·9
Financially independent	212 (54)	53 (35)	0·5	0·4–0·7**

** $P<0·01$; Fisher's two-sided exact test (all other P values non-significant).
† Data not available on full sample.

are taken over by other female family members) was a protective factor. Support by family members with routine child-care, and the presence of the infant's grandmother were both protective factors. Risk of depression was less if living in an extended family.

Socio-economic factors (*Table 2*)

No association was found between literacy state of mothers and post-natal depression. Significant positive associations were found with husband being illiterate or unemployed, but no association was found with greater time spent away from home by the father (more than 6 months).

There was no association between post-natal depression and husband's monthly income, or poor socio-economic situation (assessed by LHWs to be <3 on the 5-point Likert scale). Too few women were employed to assess the impact of employment status, but significant negative associations were found between 'financial independence' of women and depression. Financial independence was measured by asking women if they were given money to spend on running the household by head of the household, and if they could take independent decisions on how to spend it.

The simultaneous effects of significant risk and protective factors on post-natal depression were analysed using logistic regression analysis, including only those variables that had a significant effect in the univariate analysis in the model. Statistically significant associations remained positive for husband's unemployment (odds ratio (OR) 4·4, 95% CI 1·9 to 10·3, $P<0·01$), serious arguments with significant family member (OR 4·4, 95% CI 1·8 to 10·8, $P<0·01$), living in a nuclear family (OR 4·3, 95% CI 1·4 to 13·3, $P=0·01$), and more than two female children (OR 3·1, 95% CI 1·7 to 5·9, $P<0·01$); while associations remained negative for family support in childcare (OR 0·3, 95% CI 0·11 to 0·74, $P=0·01$) and observance of the 'chilla' ritual (OR 0·3, 95% CI 0·15 to 0·68, $P<0·01$).

DISCUSSION

To our knowledge, this is the first population-based study of antenatal and post-natal

depression in a rural setting of a low-income developing country. As the sample is community rather than hospital-based, it is more likely to be representative of the rural population. The key findings are that more than one-quarter of mothers suffers from depression during the antenatal and post-natal periods, and the disorder is associated with significant disability. While confirming the role of established risk factors such as threatening life events and lack of social support, it demonstrates the positive influences of the traditional extended family and associated practices.

Cooper *et al.* (1988) first demonstrated that post-natal psychiatric disorder did not differ qualitatively or quantitatively from psychiatric disorders arising at other times and the finding has been replicated by others since (Evans *et al.* 2001; Patel *et al.* 2002). Our finding that depression already exists in more than 95% of the women in the antenatal period is consistent with these studies.

However, two epidemiological studies in the same district, but on non-post-natal women, have reported higher prevalence rates of 46% (Mumford *et al.* 1997) and 57% (Husain *et al.* 2000). A likely reason for this could be methodological differences (we used a single stage design, more stringent SCAN interview, and more experienced interviewers). The other possibility could be that pregnancy and birth of a baby are protective factors. A possible mechanism could be the elevated status, greater support, and sense of 'fulfilment' conferred to women by these events. If true, this finding could have implications for population control programmes in similar large rural agrarian communities.

If, however, these differences in prevalence rates are artefactual, it is possible that many women in this population suffer from chronic depression that is not greatly influenced either way by pregnancy and childbirth.

There is some evidence for association of depression with gender-based factors: women who have two or more female children are at a higher risk of having depression. This supports the findings of Patel *et al.* (2002) who found that a woman who already had a female child faced greater stress because of her wish that her new infant be a boy, reflecting the preference for male children inherent in South Asian culture.

The study demonstrates the importance of traditional extended family as a protective factor. Others have suggested a similar role for this factor in psychiatric illness (Kakar, 1981; Mumford *et al.* 1997). As communities undergo rapid demographic and socio-economic changes, the erosion of traditional family structures and related practices such as the '*chilla*' ritual could become increasingly important determinants of stress and psychiatric problems in post-natal women. Anthropological studies have found similar protective practices in other cultures. For example, Pillsbury (1978) in China found that during the first post-natal month, mothers are lavished with attention by family and friends, much more so than the infant. Kelly (1967) observed a similar practice in the Ibibio people of Nigeria, where the new mother and baby were placed in a special hut and attended to by the woman's mother and other family members for several months. Both authors found little evidence of post-natal depression in these cultures, attributing this to their traditional family practices.

On the other hand, some degree of control on family finances by the woman (more prevalent in nuclear families and in families where the husband is absent) seems to exert a protective influence. This could be related to issues of empowerment; women who have more personal freedom and autonomy tend do be less stressed than those who have the same level of responsibilities of childcare but little power to exercise these responsibilities. The most vulnerable may be those families that are in transition from a more traditional way of life – to one necessitated by recent sociodemographic and economic changes. Cooper and colleagues' (1999) South African peri-urban sample of post-natal women was obtained from such a transitory society, with high rates of recent rural to urban migrants and socio-economic adversity, which may have been reflected in the higher prevalence rate of 34·7% in that community.

The implication of this study, given the high prevalence of post-natal depression, is that attention must be paid to developing cost-effective intervention strategies. The first year of the child's life is crucial in terms of physical and psychological development, yet this is also a period where many mothers are susceptible to developing a depressive disorder. Mental health

of mothers could therefore be integrated into programmes of child care such as the World Health Organization's Integrated Management of Childhood Illness strategy (Child and Adolescent Health and Development Division, 1998). Early recognition of the disorder in the antenatal period by health workers could lead to specific targeting of this high-risk group. Use of simple mental health techniques to engage with these mothers, provide support, practical help and advice on child health in a more effective way could help reduce stress and chronicity of symptoms in these mothers and prevent long-term adverse outcomes in their children.

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