CASE REPORT

Postpartum Depression in North Indian Women: Prevalence and Risk Factors

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Introduction

Affective disorders occur commonly in postpartum period, ranging in severity from mild and transient "baby blues" experienced by 50–80 % of women to postpartum psychosis which affects <1 % of women [1]. Postpartum major depression lies along this spectrum of postnatal mood disorder. The debilitating effects of postpartum depression (PPD) can involve an entire family [2], and women afflicted with PPD are at high risk for recurrent depression [3]. Majority of them exhibit symptoms by 6 week postpartum and if not treated, many women continue to be depressed at the end of the first postpartum year [1]. Despite its serious consequences and amenity to treatment, PPD often remains unrecognized.

Numerous studies carried out in developed countries provide compelling evidence that postnatal depression is associated with long term emotional, cognitive, and intellectual problems in children [4]. There is some evidence that poor maternal mental health may also be associated with malnutrition and poor physical health in infants in developing countries [5]. Possible higher prevalence of PPD in mothers of female child 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. PPD is therefore likely to have important public health consequences in the developing world. Thus, PPD is of particular relevance in health planning, from the viewpoint of maternal and child health. It is also predicted that non-communicable diseases including mental disorders in developing countries would increase many folds in 2020 [6], but lack of research on psychological morbidity, particularly puerperal psychosis and depression, would remain a challenge for assessing the global burden of disease [7]. Few studies related to postnatal depression are reported from South Asia including India [8–12], but information from northern India is lacking. This study intends to add to the existing knowledge about PPD and associated risk factors in northern India.

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Methods

Study Setting and Sample Size

A cross sectional study was designed to assess the prevalence of postpartum depression among women attending post natal clinic of a teaching hospital that catered not only to the population of Delhi but also of other adjacent states of Northern India.

Primary outcome variable was the presence of depression and secondary outcome variable was various risk factors for PPD. The sample size was calculated taking 13 % of prevalence of PPD [12] accepting worst frequency of eight with 95 % confidence level which was a maximum of 174 using the StatCal program of Epi info. However, attempts were made to include 230 new cases in Post Natal Clinic but finally, 202 women were recruited who had given informed consent and were in the age group of 18–40 years.

Measure of Mental Health

Mental health screening instrument PRIME MD Today was used to identify depression at 6 weeks of postpartum period. PRIME MD Today is an acronym for PRIMary care evaluation of mental disorders, and it is a self-administered patient questionnaire which makes diagnosis based on DSM-III R & IV. This instrument has been field tested and validated in large primary care patient samples [13]. In India, the Prime MD Today questionnaire (English version) has been translated in 11 regional languages including Hindi, and in the present study, Hindi version of the questionnaire was used because it was the locally spoken language. The patients diagnosed with major depression by PRIME MD today were referred to a psychiatrist for further evaluation and management.

Assessment of Risk Factors

A questionnaire was designed and pretested for the assessment of risk factors for PPD based on previously reported risk factors. That questionnaire included:

1. Social and demographic details including age, educational qualification, family structure (nuclear/joint), occupation, environmental health status (housing, own land, overcrowding), and socio-economic status using Kuppuswami scale.
2. Obstetric history including number and gender of children, present pregnancy (wanted/unwanted, planned/unplanned, fears and expectations regarding gender of child, mode of delivery, complications both during pregnancy and delivery), and any complication during previous pregnancies.
3. Adverse life events during last 1 year which include ten items on a checklist selected from established life event scales.
4. History of previous personal and 1st degree family psychiatric disorder, and treatment for the same.
5. Relationship with and support from the family including relationship with the partner, parents, and in-laws.

Data Analysis

Data were analyzed using WHO software package Epi Info. Various risk factors and their association were determined by odds-ratio and significant association was accepted at <5 % level of error using Chi square or Fisher's exact tests. In order to identify the most important confounding variables, logistic regression analysis was carried out entering each variable, first alone, then in groups, systematically. The presence of depression was taken as a dependent variable and various risk factors were assessed as independent variables.

Ethical Consideration

Ethical approval was obtained from the institutional ethical committee. Each woman was informed about the objectives of study and implications in providing their personal information and only consented women were recruited in the study. They had freedom to opt out from the study without affecting their rights of getting consultation at the hospital. Patient's information was dealt with confidentiality.

Results

In total, 202 new post natal cases participated in the study. The mean age of the sample was $24.62 + 3.7$ years. Out of total 202 women, 32 (15.8 %) were diagnosed with depression using Prime MD Today in the study. On comparing the socio-demographic factors among women with depression and women without depression, females with PPD were significantly more likely to be less educated (up to primary level) and belonged to low socio-economic class ($p < 0.01$). Overcrowding was also found to be significantly associated with PPD ($p < 0.01$) (Table 1).

Comparison of the obstetric factors and gender issues among women with PPD and without it showed that depression was significantly associated with having more than two children, more than one girl child, and pressure and expectation to deliver a male child. However, factors

Table 1 Socio-demographic factors in postpartum depression

Risk factor	With depression $n = 32$ (%)	Without depression $n = 170$ (%)	Odds-ratio (95 % CI)	χ^2/Fisher	p value
Age (years)					
>30	4 (12.50)	7 (4.12)	3.33 (0.76–13.85)		0.08
≤30	28 (87.50)	163 (95.88)	1.0		
Education					
≤Primary	19 (59.37)	46 (27.06)	3.94 (1.69–9.27)	12.89	<0.01*
>Primary	13 (40.63)	124 (72.94)	1.0		
Family structure					
Nuclear	16 (50.00)	62 (36.47)	1.74 (0.76–3.98)	2.08	0.15
Joint	16 (50.00)	108 (63.53)	1.0		
Occupation					
Housewife	32 (100)	164 (96.47)	–	–	0.35
Other	0 (0)	6 (3.53)			
Type of house					
Kutcha	6 (18.75)	18 (10.59)	1.95 (0.62–5.86)	1.71	0.19
Pucca	26 (81.25)	152 (89.41)	1.0		
Owns land					
No	16 (50.00)	64 (37.65)	1.66 (0.73–3.78)	1.72	0.19
Yes	16 (50.00)	106 (62.35)	1.0		
Overcrowding					
Yes	15 (46.88)	52 (30.59)	2.00 (0.87–4.61)	3.22	0.07
No	17 (53.12)	118 (69.41)	1.0		
Socio-economic status					
Low	21 (65.62)	46 (27.06)	5.15 (2.16–12.45)	18.07	<0.01*
Middle/upper	11 (34.38)	124 (72.94)	1.0		

* Statistically significant

such as delivery of a girl child against expectation of male child, whether pregnancy is wanted or unwanted, mode of delivery, and complications during delivery, past or present pregnancy did not affect the mental health of the participating women (Table 2).

Risk of development of PPD was many times more (OR 39.8, $p < 0.01$) among women with high scores of adverse life events. Similarly, PPD risk increased many fold (OR 8.69 and 33.4, $p < 0.03$) among women who had previous psychiatry history and similar complaints in first degree family members. Poor relationship and support from the family including husband and in-laws was also significantly associated with depression among post natal women ($p < 0.01$) (Table 3).

Various risk factors which were significant in the study (up to primary level education, low socio-economic status, more than one girl child, pressure to have a male child, previous personal psychiatric complaints, no close attachment to the partner, husband taking alcohol, inadequate relationship with in-laws, and lack of support from in-laws during pregnancy) and other culturally relevant factors which were not found significant in the study (wanted son but delivered daughter) were included in logistic regression

analysis. The most important independent variables were low level of education (up to primary level education), low socio-economic status, wanted son but delivered daughter, previous history of psychiatric illness, and poor relationship with the family (Table 4).

Discussion

The prevalence of PPD in the women attending postnatal clinic was 15.8 % in the study sample consistent with rates found in other studies with little variation in the South Asian region [8–12]. The study, thus, strengthens the findings of previous studies and signifies the importance of identifying PPD, more so because none of these mothers had sought help for these symptoms, although they were functionally impaired. Among the females who developed PPD, low socio-economic status, low education, rented house, more than one girl child, pressure to have a male child and delivery of a female child in spite of a desire for son, high score on adverse life events scale, previous psychiatric disorder and poor relationship with the partner, his alcohol intake as well as poor relationship and support

Table 2 Obstetric factors and gender issues in postpartum depression

Risk factor	With depression $n = 32$ (%)	Without depression $n = 170$ (%)	Odds-ratio (95 % CI)	χ^2/Fisher	p value
Total number of children					
>2	13 (40.62)	22 (12.94)	4.60 (1.84–11.50)	14.41	0.00*
≤2	19 (59.38)	148 (87.06)	1.0		
Total number of girls					
>1	14 (43.75)	30 (17.65)	3.63 (1.51–8.71)	10.77	<0.001*
≤1	18 (56.25)	140 (82.35)	1.0		
Total number of boys					
≤1	27 (84.38)	155 (91.18)	0.52 (0.16–1.80)	1.40	0.24
>1	5 (15.62)	15 (8.82)	1.0		
Present pregnancy					
Unwanted	3 (9.38)	14 (8.24)	1.15 (0.25–4.68)	–	0.53[a]
Wanted	29 (90.62)	156 (91.76)	1.0		
If wanted pregnancy[b]					
Unplanned	5 (17.24)	29 (18.59)	0.91 (0.28–2.81)	0.03	0.86
Planned	24 (82.76)	127 (81.41)	1.0		
Pressure to have a male child					
Yes	13 (40.62)	35 (20.59)	2.64 (1.10–6.28)	5.97	0.02*
No	19 (59.38)	135 (79.41)	1.0		
Wanted son but delivered daughter					
Yes	9 (28.12)	27 (15.88)	2.07 (0.79–5.35)	2.76	0.10
No	23 (71.88)	143 (84.12)	1.0		
Mode of delivery					
Instrumental/cesarean	6 (18.75)	35 (20.59)	0.89 (0.30–2.51)	0.06	0.81
NVD	26 (81.25)	135 (79.41)	1.0		
Complication during pregnancy					
Yes	5 (15.62)	32 (18.82)	0.80 (0.25–2.41)	0.18	0.67
No	27 (84.38)	138 (81.18)	1.0		
Complication during delivery					
Yes	8 (25.00)	40 (23.53)	1.08 (0.41–2.79)	0.03	0.36
No	24 (75.00)	130 (76.47)	1.0		
Complication during previous pregnancy					
Yes	9 (28.12)	35 (20.29)	1.51 (0.59–3.81)	0.90	0.34
No	23 (71.88)	135 (79.41)	1.0		

[a] Fisher's exact test

[b] With depression ($n = 29$), without depression ($n = 156$)

* Statistically significant

from in-laws were significantly associated. These risk factors are likely to be interactive as well as multiplicative in effect. These findings are consistent with findings of previous studies such as poverty, [9] low level of education [14], more than one girl child [11], pressure and desire for a male child, high adverse life events score [8], previous psychiatric disorder [15], poor spousal relation [16], and poor support from the family [8] have been implicated as risk factors, although few studies have denied one or more of these factors as significant factors [17]. The study conducted in Chennai also indicated that PPD was significantly more in women who had unskilled husbands and had non-arranged marriages. In the same study, it was found out that PPD was significantly more in women with nuclear families which were consistent with the findings of our study [10].

Our results also showed no association of PPD with obstetric risk factors like present or previous pregnancy and delivery complications which were similar to findings of the previous studies [18, 19] and were conflicting with the findings of study done in Victoria [20]. This unusual finding may be attributed to improved and better health

Table 3 Adverse life events, previous psychiatric history and family relationships in postpartum depression

Risk factor	With depression n = 32 (%)	Without depression n = 170 (%)	Odds-ratio (95 % CI)	χ^2/Fisher	p value
Adverse life events score					
High (> 5)	25 (78.12)	14 (8.24)	39.80 (13.34–124.31)	84.44	<0.01*
Low (0–5)	7 (21.88)	156 (91.76)	1.0		
History of psychiatric complaints in first degree family members					
Yes	3 (9.38)	2 (1.18)	8.69 (1.11–78.40)		0.03*
No	29 (90.62)	168 (98.82)	1.0		
Personal history of previous psychiatric complaints					
Yes	12 (37.50)	3 (1.76)	33.40 (7.79–164.78)		<0.01*
No	20 (62.50)	167 (98.24)	1.0		
Closely attached to the partner					
No	11 (34.38)	7 (4.11)	12.20 (3.84–39.82)	30.38	<0.001*
Yes	21 (65.62)	163 (95.88)	1.0		
Husband taking alcohol					
Yes	14 (43.75)	35 (20.59)	3.00 (1.27–7.10)	7.86	0.01*
No	18 (56.25)	135 (79.41)	1.0		
Adequate relationship with parents					
No	3 (9.38)	0 (0)			
Yes	29 (90.62)	170 (100.0)			
Adequate relationship with in-laws					
No	25 (78.13)	31 (18.24)	16.01 (5.91–45.12)	48.21	<0.01*
Yes	7 (21.87)	139 (81.76)	1.0		
Support from in-laws during pregnancy					
No	20 (62.50)	25 (14.71)	9.67 (3.91–24.25)	35.53	<0.01*
Yes	12 (37.50)	145 (85.29)	1.0		

* Statistically significant

Table 4 Multivariate analysis of various risk factors for PPD

Term	Odds ratio	95 %	p value
Education (up to primary level)	3.5911	1.0669	0.0390
Low socio-economic status	3.2084	1.0203	0.0461
Wanted son delivered daughter	0.1244	0.0154	0.0507
Previous personal psychiatric complaints	51.6482	6.5034	0.0002
Inadequate relationship with in-laws	9.5247	1.9636	0.0051

facilities and safer procedures performed in the tertiary care hospital.

One finding that husband's alcohol intake is associated with PPD is unique to Indian culture in sharp contrast to western countries where both men and women consider alcohol intake as normal. The differences in findings in other studies may be attributed to different psychosocial and cultural factors prevalent in those areas. It can be hypothesized that cultural practices prevalent in Northern India like "children are god's gift", "boys are assets and girls liability", psycho-social factors among Indian women like low self esteem, confinement, low level of confidence and inability to take independent decision coupled with being held responsible for every misfortunate event, creates a kind of insecurity and negative feeling among the women, more so if she is illiterate. Pregnancy is a crucial event when a woman is susceptible to mood instabilities. Birth of a girl child when desiring for a male child and more than one female child are considered as a misfortune or a kind of "curse" which is inherent in South Asian culture. Henceforth, it is considered as a significant factor for PPD in a developing country like India. Another reason for higher PPD in women who gave birth to female infants could be due to lower post natal family support [21].

While confirming the role of established risk factors like low socio-economic status, adverse life events, and negative influences of desire for a male child, we did not find any positive influence of extended families as cited by few authors [11, 21]. This can be explained by the fact that females have more personal freedom and autonomy in a nuclear family and thus, tend to be less stressed than those who have the same level of responsibilities but little power to exercise these responsibilities like in joint families. At the same time, support (both physical and emotional) from the family, especially husband and in-laws, during the pregnancy definitely has a protective role but it is not necessary that the women should stay in a joint family for their support as has been evidenced from our study. This may be attributed to the changing socio-cultural patterns in India. At the time when she has the maximum responsibilities, has worries about how to nourish her new born, is maximally susceptible to psychiatric illnesses and needs the maximum support from her family, she is denied her basic right of love, tender and care of her and her new born to meet the needs of her joint family. She then feels a vacuum in her life and feels depressed. Her problems are aggravated if she is illiterate as she is unable to think logically and take an independent stand both economically and emotionally. The findings in our study are in full concordance with what we had hypothesized.

On logistic analysis, it was found that the five variables viz. low education, low socio-economic status, birth of a girl child when a son was desired, previous psychiatric history, and poor relation with in-laws are independent variables for development of PPD. These findings are supported by studies done elsewhere [22–24]. Other variables are either direct or indirect outcome of these factors.

With the limited resources, the present design of the study served the purpose using adequate sample size. However, the study had some limitations. This study being cross sectional in nature, it is not known whether the risk factors occur prior to or after the depressive period. This means that a factor can both be a risk factor or the consequence of the depressive disorder. But PPD can't be causal to the majority of risk factors such as illiteracy, low socioeconomic status, and giving birth to girl child in the study. On the other hand, these factors can be causal to depression. Prevalence detected by the study may be an underestimation of the problem as some women who are depressed may not turn up in the hospital. Hence community-based survey and prospective studies are better designs for these situations. It should also be mentioned that some factors (e.g., somatic illness, bio- hormonal factors) were not controlled in the present study, which may have a role in PPD.

To conclude, this study provides useful information about the prevalence of PPD and risk factors especially the role of socio-cultural environment and practices prevalent in the North Indian region. Since socio-cultural factors play a major role in causation of PPD, these should be aimed for. People still consider a girl child a liability. Efforts to improve the condition of women by identifying the loopholes and measures to make them independent both economically and emotionally such as higher literacy and improved socio-economic status warrant further research. Further, more effective measures such as appointment of counselors, at the level of health care setting, to screen and counseling for PPD are warranted since none of the mothers had sought treatment despite having functional disability. This will improve quality of care required under National Rural Health Mission to reduce maternal morbidity due to depression and neglect.

References

1. Stowe ZN, Nemeroff CB. Women at risk for postpartum-onset major depression. Am J Obstet Gynecol. 1995;173:639–45.
2. Weinberg MK, Tronick EZ. Maternal depression and infant maladjustment: a failure of mutual regulation. In: Nospitz JD, editor. Handbook of child and adolescent psychiatry. New York: Wiley; 1997. p. 177–91.
3. Cohen LS, Altshuler LL. Pharmacologic management of psychiatric illness during pregnancy and the postpartum period. Psychiatr Clin North Am. 1997;4:21–60.
4. World Health Organization. Investing in Health Research and Development report of the Ad Hoc Committee on Health Research relating to future intervention options. Geneva: WHO; 1996.
5. Global Forum for Health Research. The 10/90 report on Health Research 2000. Geneva: Global Forum for Health Research; 2000.
6. Cooper PJ, Murray I. Post-natal depression. Br Med J. 1998;316:1884–6.
7. Rahman A, Harrington RA, Bunn J. Can maternal depression increase infant risk of illness and growth impairment in developing countries? Child Care Health Dev. 2002;28:51–6.
8. Chandran M, Tharyan P, Muliyil J, et al. Post-partum depression in a cohort of women from a rural area of Tamil Nadu, India. Incidence and risk factors. Br J Psychiatry. 2002;181:499–504.
9. Patel V, Rodrigues M, De Souza N. Gender, poverty and post-natal depression: a cohort study from Goa, India. Am J Psychiatry. 2002;159:43–7.
10. Prabhu TR, Asokam TV, Rajeshwari A. Post partum psychiatric illnesses. J Obstet Gynecol India. 2005;55(4):329–32.
11. Rahman A, Iqbal Z, Harrington R. Life events, social support and depression in childbirth: perspectives from a rural community in the developing world. Psychol Med. 2003;33:1161–7.
12. Sood M, Sood AK. Depression in pregnancy and postpartum period Indian. J Psychiatry. 2003;45(1):48–51.
13. Spitzer RL, Kroenke K, Williams JBW, DSW and the Patient Health Questionnaire Primary Care Study Group. Validation and utility of a self-report version of Prime MD today. The PHQ primary care study. JAMA. 1999;282:1737–44.

14. Patel V, Araya R, Lima MS, et al. Women poverty and common mental disorders in four restructuring societies. Soc Sci Med. 1999;49:1461–71.

15. Wilson LM, Reid A, Midmer DK, et al. Antenatal psychosocial risk factors associated with adverse postpartum family outcomes. CMAJ. 1996;154:785–99.

16. Collins NL, Dunkel-Schetter C, Lobel M, et al. Social support in pregnancy: psychosocial correlates of birth outcomes and postpartum depression. J Pers Soc Psychol. 1993;65:1243–58.

17. Chaaya M, Campbell OMR, El Kak F, et al. Postpartum depression: prevalence and risk factors. Arch Women Ment Health. 2002;5(2):65–72.

18. Johnstone SJ, Boyce PM, Hickey AR, et al. Obstetric risk factors for postnatal depression in urban and rural community samples. Aust N Z J Psychiatry. 2001;35(1):69–74.

19. Patel RR, Murphy JD, Peters TJ. Operative delivery and postnatal depression: a cohort study. BMJ. 2005;330(7496):879.

20. Astbury J, Brown S, Lumley J, et al. Birth events, birth experiences and social differences in postnatal depression. Aust J Public Health. 1994;18:176–84.

21. Xie R-H, Liao S, Xie H, et al. Infant sex, family support and postpartum depression in a Chinese cohort. J Epidemiol Community Health. 2011;65(8):722–6.

22. Krause KM, Østbye T, Swamy GK. Occurrence and correlates of postpartum depression in overweight and obese women: results from the active mothers postpartum (AMP) study. Matern Child Health J. 2008;13(6):832–8.

23. Klainin P, Arthur DG. Postpartum depression in Asian cultures: a literature review. Int J Nurs Stud. 2009;46(10):1355–73.

24. Kheirabadi GR, Maracy MR, Barekatain M, et al. Risk factors of postpartum depression in rural areas of Isfahan province, Iran. Arch Iran Med. 2009;12(5):461–7.