

Assessment of risk of depression among the antenatal mothers attending a tertiary care hospital of Kolkata, India

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Abstract: *Background:* Antenatal depression is a nonpsychotic depressive episode that initiates during pregnancy. But it is often under diagnosed and less documented. Maternal depression is one of the risk factor for poor growth and development in young children. *Objectives:* The present study was conducted with the objectives to assess proportion of mothers at risk of antenatal depression and to find out the distribution of risk factors for maternal depression. *Methods:* A descriptive, cross-sectional study was conducted among 225 antenatal mothers attending a tertiary care hospital of Kolkata from January to March 2020. The mothers were interviewed face to face using predesigned pretested questionnaire, including use of Edinburgh Postnatal Depression Scale (EPDS). The data were analysed by simple descriptive statistics and statistical tests of significance like Chi square test was applied. *Results:* About 30.67% of antenatal mothers were found to be possibly suffering from the depression. Maternal educational status, social class, addiction, early registration, consumption of extra meal and iron folifer supplementation were found to be significantly associated with the risk of possible maternal depression. The association between risk of maternal depression and parity, planning of pregnancy were highly significant. *Conclusion:* The health professionals should regularly screen mothers to detect depressive symptoms at an early stage. Effective prevention programme can help to reduce maternal depression and ensure good perinatal outcome.

Keywords: Antenatal Mothers, Maternal Depression, Risk Factors,

Introduction

Depression is a significant contributor to the global burden of disease and affects people in all communities across the world. More than 264 million people of all age groups suffer from depression globally. Although it is the leading cause of disability among all but burden is 50% higher in females in low, middle and even high income group countries. Research shows maternal depression is one of the risk factor for poor growth and development in young children [1].

During pregnancy several hormonal changes occur eg: increase in oestrogen, progesteron and dopamine and decrease in serotonin, cortisol, norepinephrine. There is great variation in effects of hormonal changes on mental status of women. Sudden, rapid drop in the levels of pregnancy hormones after birth of baby is thought to trigger postpartum affective disorder, ranging from

Postpartum Blues, Postpartum Depression to Puerperal psychosis. Postpartum blues account for 30 - 75% of cases which can be dealt with reassurance only. Research showed that nonpsychotic postpartum depression accounts for 10-15% of women after delivery, within first 6 weeks following childbirth and most cases require treatment. 0.1 -0.2% cases present with Puerperal Psychosis which usually require hospitalization [2].

But perinatal mental illness is often under diagnosed. It is advisable that health professional regularly screen mothers not only in post partum period but also in antenatal period so that early therapeutic intervention can be initiated [3]. Antenatal depression has been recognised as the strongest predictor of post natal depression, which in turn is the strongest predictor of parenting stress [4]. Moreover antenatal depression has also been associated with stillbirth, premature birth, low

birth weight, low Apgar scores, smaller head circumference and major congenital anomalies [5]. A systematic literature analysis of 97 papers using PubMed, PsychINFO and the Cochrane Library conducted by Biaggi et al revealed the most relevant factors associated with antenatal depression were: lack of partner or of social support, history of abuse or of domestic violence, personal history of mental illness, unplanned pregnancy, adverse events in life, present or past pregnancy complications and pregnancy loss [6].

The prevalence of antenatal depression was estimated to be between 7% to 20% in high-income countries and rates of 20% or more in low- and middle- income countries, although limited studies have been conducted in these areas [6]. Thus present study was conducted to identify those antenatal mothers with increased risk factors for postpartum depression, with help of Edinburgh Postnatal Depression Scale (EPDS) [7]. This scale is commonly used to identify postpartum mothers at risk. But there are several instances that it can be used even among the antenatal mothers [8-10]. Edinburgh Postnatal Depression Scale (EPDS) is also validated for screening of minor and major depressive symptoms among both antenatal and postnatal mothers [11-12].

Hence present study was carried out with the objectives to assess proportion of antenatal mothers at risk of maternal depression and to find out the distribution of risk factors for maternal depression.

Material and Methods

A descriptive, cross-sectional study was done among the antenatal mothers attending outpatient department of Gynaecology and Obstetrics in Nil Ratan Sircar Medical College & Hospital, Kolkata, West Bengal, India during January to March 2020. Prior permission was obtained from Institutional Ethical Committee.

From a previous study among antenatal women [13] the prevalence of antenatal depression was found to be 33%. Therefore based on anticipated population proportion $P= 33\%$ and assuming confidence level of 95% and absolute precision of 10% , the minimum required sample size was calculated using the following formula:

$$n = Z_{1-\alpha/2}^2 \frac{P(1-P)}{d^2}$$

$$= \frac{(2)^2 \times 0.33(1-0.33)}{(0.1)^2}$$

$$= 88$$

$P = 33\%$
 $Z_{1-\alpha/2} = 1.96 \approx 2$
 $d = 10\%$

Assuming 20% non response rate and design effect of 2, minimum sample size was 212. Thus a total of 225 multiparous women who were having at least one child registered for the study. Considering all those mothers fulfilling inclusion criteria study subjects were selected consecutively until the final sample size was achieved.

The mothers were assured of anonymity and confidentiality of the information collected. They were interviewed face to face after obtaining informed verbal consent, using predesigned pretested questionnaire, which was translated to the local languages. Those who were not willing to give consent were excluded from the study.

The questionnaire was divided into 2 parts, first part comprised of questions related to socio-demographic information and certain other probable risk factors like planning of pregnancy, last child birth, sex of last child etc that may contribute to depression. Second part was used to assess the risk of depression among antenatal mothers using Edinburgh Postnatal Depression Scale (EPDS) [7].

This question was developed to identify possible symptoms of depression. It was a screening tool to identify the mothers who could be benefited from mental health intervention and usually completed within 5 minutes. EPDS is a 10 item questionnaire, where women were required to answer each question in terms of past 7 days. Responses were scored 0,1,2,3 according to the severity of the symptoms. Some of the questions had reversed scoring. Total score was determined by adding together the scores for each 10 items. The questionnaire was validated several times among antenatal mothers in different validation studies and those studies had utilized various threshold scores for referral [10-12, 14].

Cut off scores ranged from 9-13 points. Thus to remain on safe side women’s score more than 9 was taken as cut off points for possible depression [7]. Respective department was informed about those antenatal mothers suspected to be suffering from possible depression and they were referred to the Department of Psychiatry for further screening and multiple evaluation.

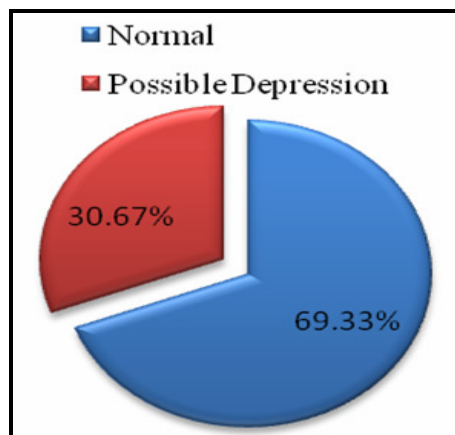
All collected data were compiled and analysed by MS Excel 8.0 and Epi info 3.4.3. Results were presented and statistical tests of significance like Chi square test were applied. A significance level of 0.05 was used.

Results

During the current study, 225 multiparous mothers attending the antenatal clinic of NRS Medical College and Hospital were considered. Among the mothers 2.22% were teenage mothers, 82.67% Hindus, 37.78% from urban area, 5.78% illiterate and majority (93.33%) were homemakers. About 53.26% mothers belonged to lower social class (according to Modified B.G. Prasad’s scale classification of 2019) [15].

Nearly 30.67% of mothers were found to be possibly suffering from the depression after risk of depression were screened by Edinburgh Postnatal Depression Scale (EPDS) [Fig: 1].

Fig-1: Pie diagram showing proportion of study population suffering from Possible Depression (N=225)



About 33.34% of the mothers had not been able to laugh and 43.56% had not been able to look forward with enjoyment in past 7 days. 71.56% blamed herself unnecessarily when things went wrong and 72.89% had been anxious or worried for no good reasons. 65.78% felt scared or panicky for no good reasons, but 72% thought things had been getting on top of one. 80.45% of the mothers felt so unhappy that one had difficulty in sleeping, 37.34% felt sad and miserable and 35.56 % had been so unhappy that one had been crying. But 14.67% of antenatal mothers alarmingly thought of harming oneself.

Socio-demographic factors like age, type of family, residence and occupation were not significantly related to the risk of maternal depression. Educational status was significantly ($p < 0.05$) related to the risk. It was also found that risk of maternal depression significantly reduced as the social class improved [Table 1].

Personal characteristics like maternal addiction, early registration of pregnancy, consumption of extra meal during pregnancy, Iron folifer supplementation during antenatal period were all significantly ($p < 0.05$) related to the risk of maternal depression. Nearly 55.56% of addicted mothers were at risk of depression, while only 28.50% of non-addicted mothers were at risk of depression.

29.30% of mothers who had early registration were possibly depressed while 60% of the mothers who were not registered within first trimester were possibly depressed. It was also found 52.27% of mothers were at risk of depression those who didn't take extra meal, but 25.41% of mothers were possibly depressed who took extra meal. Similarly, only 28.9% of mothers were possibly depressed among those who took iron folifer supplementation; rather 57.14% of mothers were possibly depressed who didn't take iron folifer supplementation [Table 2].

Table-1: Distribution of study population according to possible depression and sociodemographic profile: (N= 225)				
Sociodemographic profile	Possible depression (N1= 69)	Normal (N2= 156)	Total (N= 225)	Statistical Tests
	No (%)	No (%)	No (%)	
Age (in years)				
< 20	2 (40)	3 (60)	5 (2.22)	$\chi^2 = 2.1972$; $df=3$; $p= 0.532506$
20 -25	34 (27.2)	91 (72.8)	125 (55.56)	
26 – 30	29 (36.25)	51 (63.75)	80 (35.55)	
> 30	4 (26.67)	11 (73.33)	15 (6.67)	
Educational Status:				
Illiterate	8 (61.54)	5 (38.46)	13 (5.78)	$\chi^2 = 9.683$; $df=4$; $p= 0.046119$
Primary	25 (37.31)	42 (62.69)	67 (29.78)	
Secondary	12 (26.09)	34 (73.91)	46 (20.44)	
Higher Secondary	19 (25)	57 (75)	76 (33.78)	
Graduate & Above	5 (21.74)	18 (78.26)	23 (10.22)	
Occupational Status:				
Homemaker	63 (29.86)	148 (70.14)	211 (93.78)	$\chi^2 = 1.0434$; $df=1$; $p= 0.307026$
Working	6 (42.86)	8 (57.14)	14 (6.22)	
Type of Family:				
Nuclear	40 (29.20)	97 (70.80)	137 (60.89)	$\chi^2 = 0.3558$; $df=1$; $p= 0.55085$
Joint	29 (32.95)	59 (67.05)	88 (39.11)	
Social Class:				
Grade I	0 (0)	2 (100)	2 (0.89)	$\chi^2 = 19.0453$; $df=3$; $p=0.000268$
Grade II	5 (16.67)	25 (83.33)	30 (13.33)	
Grade III	19 (24.36)	59 (75.64)	78 (34.67)	
Grade IV	24 (30)	56 (70)	80 (35.56)	
Grade V	21 (60)	14 (40)	35 (15.55)	
Residence:				
Rural	47 (33.57)	93 (66.43)	140 (62.22)	$\chi^2 = 1.4706$; $df=1$; $p= 0.225246$
Urban	22 (25.88)	63 (74.12)	85 (37.78)	

Table-2: Distribution of study population according to possible depression and personal characteristics: (N= 225)				
Personal Characteristics	Possible Depression (N1= 69)	Normal (N2= 156)	Total (N= 225)	Statistical Tests
	No (%)	No (%)	No (%)	
Addiction				
Yes	10 (55.56)	8 (44.44)	18 (8)	$\chi^2 = 5.7002$; $df=1$; $p= 0.016963$
No	59 (28.50)	148 (71.5)	207 (92)	
Early registration done:				
Yes	63 (29.30)	152 (70.70)	215 (95.56)	$\chi^2 = 4.235$; $df=1$; $p= 0.039598$
No	6 (60)	4 (40)	10 (4.44)	
Extra meal taken during pregnancy:				
Yes	46 (25.41)	135 (74.59)	181 (80.44)	$\chi^2 = 12.0088$; $df=1$; $p= 0.00053$
No	23 (52.27)	21 (47.73)	44 (19.56)	
Iron Folifer Supplementation				
Yes	61 (28.9)	150 (71.1)	211 (93.78)	$\chi^2 = 4.9219$; $df=1$; $p= 0.026519$
No	8 (57.14)	6 (42.86)	14 (6.22)	

Parity of mothers and planning of current pregnancy were significantly ($p < 0.05$) associated with the risk of developing maternal depression. It was found that, 47.69% of mothers, who had more than one child, were possibly depressed, whereas 23.75% of mothers who had one child were possibly depressed. 75% of mothers who had unplanned pregnancy were possibly depressed, but only 24.37% of mothers, who had planned pregnancy, were possibly depressed. Age of last child and sex of last child were associated

with the risk, but the association were not statistically significant. Occurrences of possible depression were almost similar among the mothers with time since last child birth of less than and more than 3 years (32.61% & 29.32%). 34.4% of mothers were possibly depressed among the mothers with female child and 26% of mothers were possibly depressed who had male child [Table 3].

Table-3: Distribution of study population acc to possible depression and obstetric attributes: (N= 225)				
Obstetric attributes	Possible Depression (N1= 69)	Normal (N2= 156)	Total (N= 225)	Statistical Tests
	No (%)	No (%)	No (%)	
Parity				
< 2	38 (23.75)	122 (76.25)	160 (71.11)	$\chi^2 = 12.4616$; $df=1$; $p= 0.000415$
≥ 2	31 (47.69)	34 (52.31)	65 (28.89)	
Planned pregnancy				
Yes	48 (24.37)	149 (75.63)	197 (87.56)	$\chi^2 = 29.5615$; $df=1$; $p= 0.00001$
No	21 (75)	7 (25)	28 (12.44)	
Age of Last Child				
< 3 yrs	30 (32.61)	62 (67.39)	92 (40.89)	$\chi^2 = 0.2761$; $df=1$; $p= 0.599288$
≥ 3 yrs	39 (29.32)	94 (70.68)	133 (59.11)	
Sex of Last Child				
Female	43 (34.4)	82 (65.6)	125 (55.56)	$\chi^2 = 1.8436$; $df=1$; $p= 0.174524$
Male	26 (26)	74 (74)	100 (44.44)	

Discussion

Antenatal depression appears to be as common as postpartum depression. It is found to be key risk factor for postpartum depression. The growing number of literature showed that antenatal psychological stress can affect both maternal and foetal wellbeing adversely. Several researches had been conducted on predictive factors of postpartum depression. It is essential to find the prevailing risk factors of maternal depression so that we can prevent occurrence of maternal depression by modifying those risk factors.

Current study found that 30.67% of mothers were possibly suffering from the depression, comparable to the prevalence of antenatal depression of 33%, when a community based

study was conducted among the antenatal mothers at 34-35 weeks of gestation in rural Bangladesh [13]. It was found by Gavin NI et al that 18.4% of mothers with uncomplicated pregnancy reported symptoms of major or minor depression [16]. However 44.2% of mothers hospitalised for obstetric risk reported significant symptoms of depression [17]. 19% of antenatal mothers and 22% of postnatal mothers were reported to be suffering from depression in Jordan [18]. 13.8% of Malaysian antenatal mothers showed depressive symptoms during antenatal period [19].

Prevalence of antenatal depression was 12.3% among mothers attending outpatient department of obstetrics in tertiary care

hospital, Bengaluru [20]. A US cohort study found prevalence of depression of 9% at mid pregnancy, which was more among Hispanic women [21].

Socio-demographic factors contribute to risk of developing maternal depression. Present study revealed that, educational status and socioeconomic status significantly contributed to the risk of maternal depression. It was also found that risk of maternal depression significantly reduced as the social class improved. Financial problem was also found to be significantly associated with maternal depression in a study conducted in Jordan [18]. Higher educational status and being a homemaker were significantly associated with EPDS score among antenatal mothers of Bengaluru and possible reason predicted was being educated and unemployed may give rise to unfulfilled aspirations [20].

In the current study socio-demographic factors like age, type of family, residence and occupation were not significantly related to the risk of maternal depression. But main risk factor identified for major depression was maternal age among the low income African American antenatal mothers [22]. A linear trend was found until age 30, after which slope changed markedly with a more pronounced likelihood for major depression. Mothers with age of > 30 years were 5 times likely to suffer from major depression, whereas present study found more teenage mothers were likely to suffer from possible depression. Younger maternal age was associated with higher risk of maternal depression, as found in a US cohort study [21]. Lower income and financial hardship were also found to be associated with maternal depression.

Personal characteristics also determine maternal mental status. Current study found that addiction among mothers was significantly associated with the maternal risk of depression. M. Pajulo et al also described substance abuse as a significant independent risk factor of maternal depression [23]. Obstetric parameters like parity, planning of pregnancy significantly associated with maternal depression. But times since last child birth, sex of last child were not significantly associated. Similarly gender of the last child was not statistically significant in the study conducted by A. D. Bavle et al [20].

On the contrary a study in Bangladesh found that male child preference contributed to maternal depression [13]. K.I.Mohammad et al also found that unplanned pregnancy was associated with maternal depression and the mothers felt pressured to giving birth to female child and in quick succession [18]. In the same way with the current study those mothers in Malaysia having planned pregnancy were less likely to be depressed [19]. Likewise a US cohort study found unwanted pregnancy as an important contributing factor of maternal depression [22].

The perinatal period usually presents a high-risk time for development of mood disorders. Maternal mental health problems stand unique to other maternal morbidities as it directly hampers the psychological support and protection offered by a mother to her child, family and the community. WHO's mental health GAP Action Programme (mhGAP) also considered depression as one of the priority condition and it recommends use of cognitive behavioural therapy for perinatal depression [24].

There were few limitations of the present study. Firstly, a source of recall and measurement bias may be introduced by the self-report nature of a range of questions asked of women during assessment. This bias may be initiated in either direction, causing over- or underestimation of the distribution of risk factors over maternal depression. Secondly in the present study socio-demographic factors, personal characteristics and obstetric parameters were assessed as risk factors of antenatal depression, but whether women exposed to major environmental catastrophes or women having pre-existing health conditions are remained unexplored.

Conclusion

Depressive disorders and other mental health illnesses may have a profound effect on pregnant women in developing countries. The current study revealed near about one third of mothers were possibly suffering from antenatal depression, which may be due to present lack of focus on maternal mental health. Maternal health experts in developing

countries are concentrating on direct causes of maternal deaths, understandably due to the high maternal mortality ratios in those countries.

Therefore depression has not been given a priority, especially during the pregnancy. In this study risk factors of maternal mental health problems are found to be multifactorial including socio-demographic, personal and various obstetric determinants, which can highlight the importance of development of strategies for

antenatal depression in future. Effective prevention programme and community approaches may help to prevent maternal depression effectively. Thus early intervention can prevent antenatal depression and ensure good perinatal outcome.

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