



Frequency and Risk Factors of Postpartum Post Traumatic Stress Disorder Symptoms in Indian Women

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Abstract

Objectives

To determine frequency of post-traumatic stress disorder (PTSD) at 6 weeks postpartum in Indian women and assess risk factors for the same; to determine factors that correlate with the various symptoms of PTSD

Methods

This is a cross-sectional study carried out in Karnataka, India. The study subjects comprised 100

women who had delivered at two referral hospitals in the state capital. Data on demographics, antenatal period and intrapartum period were recorded at the delivery visit prior to discharge. At 6 weeks postpartum, the PTSD Checklist for DSM-5 (PCL-5) was administered and postpartum details were collected.

Results

Frequency of postpartum PTSD was 7%. Factors associated were intrapartum perception of

danger to the mother or to the baby, history of maternal Intensive Care Unit (ICU) admission postpartum and history of Neonatal ICU admission. Significant negative correlation was found between total PCL-5 score and birth weight of the newborn.

Conclusion

An effective screening model may be developed based on the factors that increase the likelihood of development of PTSD in the postpartum period. This would help us to provide timely intervention and psychiatric reference to improve overall perinatal wellbeing of the mother and the baby.

Keywords

PTSD, postpartum, post-traumatic, stress, PCL-5, psychiatry, mental health, maternal psychology.

Introduction

Post-Traumatic Stress Disorder (PTSD) after pregnancy was first described in the year 1978 by Raoul-Duaval and Bydlowski¹. They postulated that the long ordeal of labour borne by the mother sometimes gave rise to symptoms such as nightmares, recurrent flashbacks or even tocophobia, that is, fear of childbirth. PTSD is a psychiatric disorder, defined by the co-occurrence of re-experiencing, avoidance, negative beliefs and hyper-arousal symptoms, in people who have witnessed or experienced a traumatic event.² Symptoms must last at least a month to be classified as PTSD (Annexure-3).

Study of postpartum PTSD in mainstream Psychiatry is a relatively new concept. The traumatic event triggering PTSD was previously defined as being 'outside the range of usual human experience'. This included wars and natural disasters, but childbirth was still not considered a traumatic event. All this changed with the advent of DSM-IV which removed this caveat. The current guideline for the stressor event

states that the subject must have directly experienced or witnessed an event which they perceived as involving death or threatened death, actual or threatened serious injury to oneself or to a close relative or friend. This new definition may apply to childbirth wherein events during labour or delivery may be perceived as involving actual or threatened serious injury or death to the mother or the fetus.

Various studies across the world have found the prevalence of postpartum PTSD to be around 3-10% after 4 weeks postpartum.^{3,4,5,6}

Factors associated include instrumental delivery, emergency cesarean section, manual removal of placenta, poor experience of control during delivery, prolongation of duration of labour, birth weight of the neonate and whether the pregnancy was wanted.⁷ Postpartum PTSD can affect the relationship of a couple negatively after childbirth as the stress of coping with parenting responsibilities adds to the mental burden of a new mother. A systematic review and meta-analysis found postpartum PTSD to be associated with loss of intimacy and strain in the relationship.⁸

This may also reflect on the welfare of the infant, leading to poor social and emotional development.⁹

Materials and Methods

1. Study Design and Participants

This is a cross sectional study conducted in the in Patient Department of Obstetrics, Vani Vilas Hospital, Bangalore and hospitals attached to Bangalore Medical College and Research Institute (BMCRI), Karnataka, India from May 2020 to September 2020. Data was collected from 120 subjects fulfilling the following inclusion and exclusion criteria, of whom 100 subjects were selected for final analysis. Of the remaining 20, 9

were lost to follow up and 11 were excluded in view of neonatal death.

2. Inclusion Criteria

- a) Subject willing to give written informed consent to take part in the study
- b) Subject who have delivered (by either vaginal delivery or cesarean section) at a gestational age of ≥ 28 weeks.

3. Exclusion Criteria

- a) Mothers < 18 years of age
- b) Women not compliant with follow up
- c) Subjects suffering from psychiatric disorders at the time of pregnancy or at the time of evaluation
- d) History of substance abuse during pregnancy or at the time of evaluation
- e) History of anxiety disorder diagnosed within 6 months prior to pregnancy
- f) Patients who are currently on psychiatric medications
- g) Women with perinatal mortality or loss of any close relatives during the peripartum period which may bias the study

The new mothers were visited in the post natal wards and those fulfilling the above criteria were explained the study protocol. Those willing to give written informed consent were then interviewed tete-a-tete for demographic, antenatal and intrapartum details. At 6 weeks postpartum, they were contacted for data regarding the postpartum period and for administering the Post Traumatic Stress Disorder Checklist for DSM-5 (PCL-5)¹⁶.

4. ASSESSMENT TOOLS

4. 1. Proforma

A study-specific structured questionnaire to collect socio-demographic, obstetric and postpartum

information and subjective details of birth experience (Annexure-1).

Socio-demographic details: Age, education, occupation, religion, residence, history of marital discord and domestic violence were enquired about.

Obstetric history: Details of the present as well as previous pregnancies were taken including whether the present pregnancy was planned and number of living issues. History of unwanted sexual encounters, infertility treatment, antenatal period complications, abortions both spontaneous and induced, stillbirths and neonatal deaths were also presumed to be possible factors influencing this condition.

Intrapartum details: Onset and duration of labour, gestational age at delivery, mode of delivery, baby weight and Apgar score at 1 minute, intrapartum interventions such as instrumental delivery, manual removal of placenta, peripartum hysterectomy and complications like 3rd or 4th degree perineal tear or shoulder dystocia were noted. Intrapartum experience was assessed on a Likert scale from 'Enjoyable' to 'Repulsive' and compared with previous delivery. Perception of threat of serious injury to or death of self or the baby and experience with healthcare workers was assessed.

Postpartum details: Place of stay postpartum, perception of spousal support received, history of maternal ICU admission and NICU admission of neonate.

4. 2. Screening for PTSD

Participant mothers were screened for PTSD using Post Traumatic Stress Disorder Checklist for DSM-5 (PCL-5)¹⁶ shown in Annexure-2. This is a 20-item self-report measure to assess the 20 symptoms of PTSD according to the Diagnostic and Statistical Manual of Mental Disorders, 5th Edition (DSM-5)¹⁵.

Intrusion symptoms include recurrent memories, dreams, flashbacks, or strong physical reactions to the thought of the stressful experience. Avoidance symptoms include avoiding memories and external reminders of the stressor. Negative beliefs include blaming oneself for the stressful experience, having strong negative feelings such as horror, guilt or shame, loss of interest in activities that were once enjoyable, feeling cut-off from others and trouble experiencing positive feelings. Hyperarousal symptoms include irritable behavior, angry outbursts, risky behavior, being superalert or jumpy, difficulty concentrating or trouble falling asleep. Of the 20 items, 5 pertain to intrusion symptoms (criterion B), 2 to avoidance symptoms (criterion C), 7 to negative beliefs (criterion D) and 6 to symptoms of hyper-arousal (criterion E). A scale of 0 to 4 is used for each symptom depending on the extent to which the subject was ‘bothered’ by the symptom. A score of ‘0’ implies ‘not at all’, ‘1’ stands for ‘a little bit’, ‘2’ means ‘moderately’, ‘3’ implies ‘quite a bit’ and ‘4’ means ‘extremely’. A score of 2 or more for 1 Criterion B item (questions 1-5), 1 Criterion

C item (questions 6-7), 2 Criterion D items (questions 8-14) and 2 Criterion E items (questions 15-20) in subjects who have perceived threat of serious injury or danger to their own life or the life of the baby is taken as screen positive for PTSD.

5. Statistical analysis

Collected data was analysed using appropriate statistical tests and SPSS software version 20.0. Descriptive and inferential statistical analyses were carried out. Level of significance was fixed at $p = 0.05$ and any value less than or equal to 0.05 was considered to be statistically significant.

The Statistical software IBM SPSS statistics 20.0 (IBM Corporation, Armonk, NY, USA) was used for the analyses of the data and Microsoft Word and Excel were used to generate graphs, charts.

Results

1. Participant characteristics

1. 1. Demographic details:

One hundred women aged between 18 years to 40 years of age agreed to participate in this study. The mean age was 24.6 years with a standard deviation of 4.4 years. 17% were illiterate.

Table 01: Demographic details

Variable	Subgroups	N	%
Education	Illiterate	17	17
	Primary	2	2
	Middle School	10	10
	High School	55	55
	PUC	7	7
	Degree	9	9
Occupation	Homemaker	93	93
	Profession	7	7
Religion	Hindu	54	54
	Muslim	43	43
	Christian	2	2
	Sikh	1	1
Residence	Urban	93	93
	Rural	7	7

1. 2. Antenatal details

91% of the pregnancies were planned. Comorbidities in the antenatal period were present in 71% including previous LSCS (N=17), placenta previa (N=2), hypertensive disorders of pregnancy (N=20) which included impending eclampsia (N=3) and antepartum eclampsia (N=1), partial HELLP (N=2), gestational diabetes mellitus (N=5) and type 2 diabetes

mellitus (N=4), anemia (N=7) and premature rupture of membranes (N=5) and Covid positive status (N=5).

Of the subjects, 47% were experiencing pregnancy for the first time, that is, they were primigravidae. 29% had one living issue and 14% had 2 living children. History of prior pregnancy loss in the form of abortions and stillbirths or neonatal death was present in 26% of the women.

Table 02: Antenatal details

Variable	Subgroups	N	%
Whether pregnancy was planned	Planned	91	91
	Unplanned	9	9
Gravida	Primigravida	47	47
	Multigravida	53	53
Number of living offspring	0	57	57
	1	29	29
	2	14	14
Past obstetric history of	Abortion	19	19
	Stillbirth	5	5
	Neonatal death	3	3

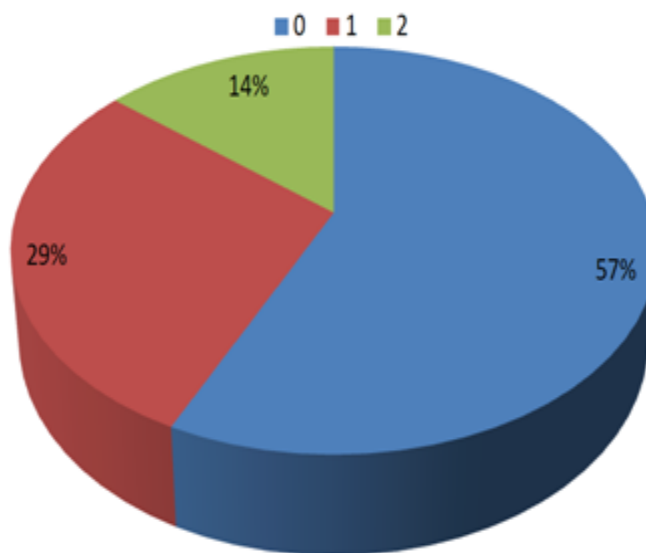


Figure 01: Number of living offspring

1. 3. Intrapartum Details

The mean gestational age at delivery was found to be 38.28 weeks (Range: 31 to 42 weeks) with a standard deviation of 2.07 weeks. Labour onset was spontaneous in 61% of the women whereas 20% had to be induced. 19% never experienced labour pain as they were delivered by LSCS prior to labour onset. Among the 54 subjects who entered active labour, the mean duration of active labour was 1.54 hours.

Normal vaginal delivery was experienced by 43% of the women, while 6% underwent uneventful elective

Caesarean section. The remaining 51% were subjected to emergency interventions such as instrumental vaginal delivery, emergency LSCS, peripartum hysterectomy or bladder repair.

The mean birth weight of the infants was 2.74 kg (range: 2 to 4 kg) with a standard deviation of 0.463 kg. They had a mean Apgar score of 6.94 at one minute (range: 3 to 8) with a standard deviation of 0.908. 23% had an Apgar score of <7 and 25% had a birth weight less than 2.5 kg.

Table 03: Intrapartum variables

Variables	N	Minimum	Maximum	Mean	Std. Deviation
Gestational age at delivery	100	31	42	38.28	2.070
Duration of active labour in hours	100	0	10	1.54	2.231
Birth weight	100	2	4	2.74	.463
Apgar score at 1 minute	100	3	8	6.94	.908

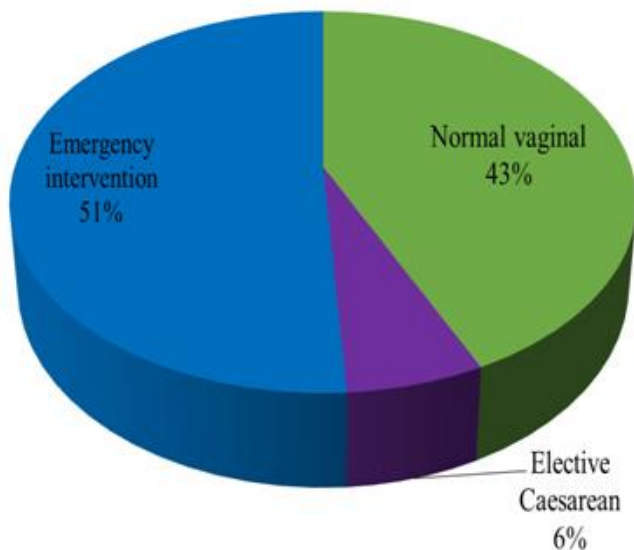


Figure 02: Mode of Delivery

1.4. Postpartum details

On enquiry regarding the experience of delivery, 20% found it repulsive and 13% found it enjoyable. With regard to spousal support, 95% were satisfied, while 5% were either unsatisfied or even experienced marital discord (N=4).

11% of the subjects said that they felt as though they were being subjected to procedures that were out of their control.

There was a perception of threat to safety or life of the baby in 25% of the women, while 16% perceived danger to themselves.

Table 04: Postpartum Variables

Variable	Subgroup	N	%
Experience of delivery	Repulsive	20	20
	Unsatisfactory	13	13
	Tolerable	28	28
	Satisfactory	26	26
	Enjoyable	13	13
Spousal support	Satisfactory	95	95
	Unsatisfactory	5	5
Perception of external locus of control	Yes	11	11
	No	89	89
Perception of danger to oneself	Yes	16	16
	No	84	84
Perception of danger to the baby	Yes	25	25
	No	75	75

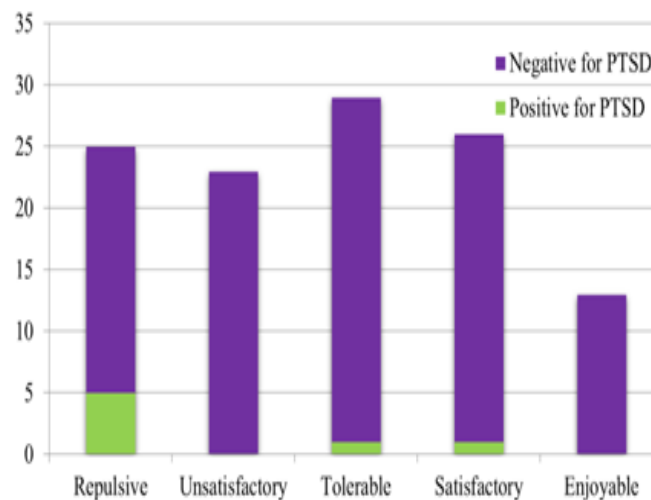


Figure 03: Comparison of Impression of Experience of Delivery with Occurrence of PTSD

2. Inferential Statistics

A provisional diagnosis of PTSD was made in 7% of the mothers examined.

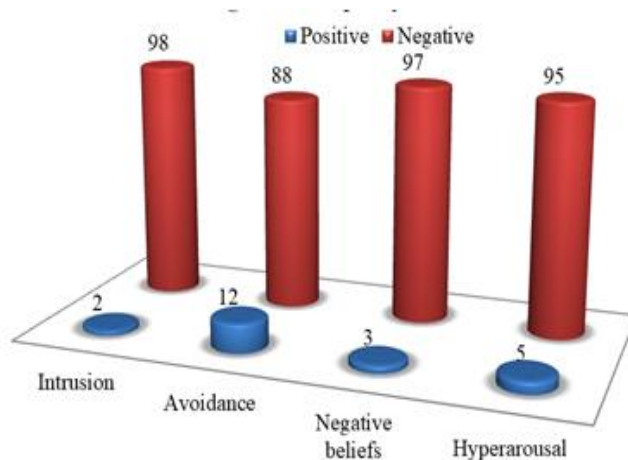


Figure 04: Frequency of Criteria B to E

2.1. Demographic

Table 05: Correlation between Total PCL-5 Score and Age

Variable	Pearson correlation	Significance
Age	0.051	.612

Table 06: Association of PTSD with Demographic Variables of Interest

Variable	Pearson Chi-square	Significance
Occupation	0.614	.433
Residence	0.614	.433
	Fisher's Exact Test	Significance
Religion	0.610	.700

2.2. Antenatal

Table 07: Correlation Between Total PCL-5 Score and Number of Living Children

Variable	Pearson correlation	Significance
No of living children	0.008	.933

Table 08: Association of PTSD with Antenatal Variables of Interest

Variable	Pearson Chi square	Significance
Whether planned	0.257	.612
	Fisher's Exact Test	Significance
Primigravida / Multigravida	0.227	1.000
Comorbidities in antenatal period	0.834	.410
Number of living issues	0.780	.459
History of pregnancy loss/ neonatal death	3.794	.051

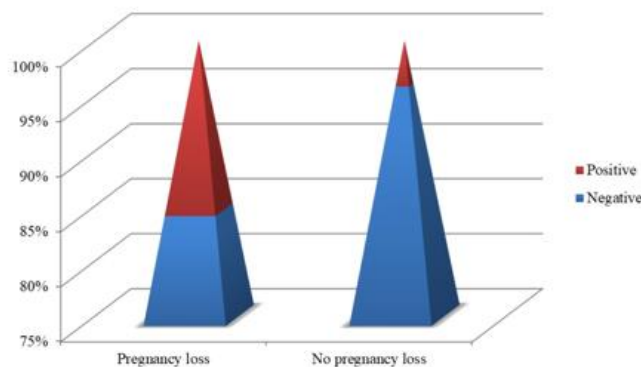


Figure 05: Comparison of Frequency of PTSD Among Women with History of Prior Pregnancy Loss/ Neonatal Death Compared to Those Who Do Not.

2.3. Intrapartum details

Table 09: Correlation between Total PCL-5 Score and Intrapartum Variables

Variable	Pearson correlation	Significance
Gestational age at delivery	-0.158	.116
Duration of active labour in hours	0.092	.362
Birth weight of the neonate	-0.247	.013
Apgar score of the neonate at 1 minute	-0.091	.366

Table 10: Association of Intrapartum Variables with PTSD

Variable	Pearson Chi-square	Significance
Mode of delivery	0.000	.994
Perception of danger to self	4.040	.044
Perception of danger to baby	8.653	.003
Perception of external locus of control	2.374	.123

2.4. Postpartum Details

Table 11: Association of Postpartum Variables with PTSD

Variable	Pearson Chi-Square	Significance
Experience of delivery	5.053	.080
Spousal support	0.626	1.000
Variable	Fisher's Exact Test	Significance
ICU admission		.012
Postpartum residence:		
Maternal vs Conjugal	1.54	.199
Joint vs Nuclear	1.47	.206
NICU admission		.017

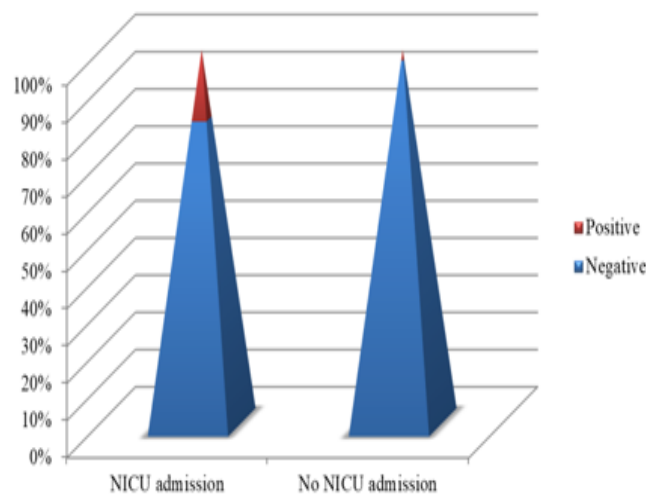


Figure 06: Comparison of Frequency of PTSD among Women with History of Nicu Admission of the Newborn Compared to Those Who do Not.

Table 12: Correlation between PTSD Symptoms and Variables of Interest in Term of Significance Using Karl Pearson’s Correlation Coefficient

Variable	Intrusion	Avoidance	Negative beliefs	Hyper-arousal
Age	.693	.789	.294	.983
Period of gestation	.103	.008	.272	.403
Duration of active labour	.011	.144	.874	.824
Birth weight	.062	.024	.041	.016
Apgar at 1 minute	.331	.165	.450	.682

Discussion

This study has been done on 100 post partum women 6 weeks after their delivery. The variables that would influence the occurrence of PTSD and their significance were analyzed. This study is probably the first of its kind in India. Search into literature did not yield any other study that has been published on this topic till now. Criteria according to DSM-5¹⁵ were used to diagnose PTSD.

This study found the frequency of women fulfilling the DSM-5 criteria for PTSD (Annexure 3) at 6 weeks postpartum to be 7%.

As shown in Table 05 and Table 06, occurrence of PTSD was independent of all the demographic details studied, which comprised age, education, occupation, religion and residence. None of these were found to be of statistical significance.

Among the antenatal factors studied, a significant association was found between postpartum PTSD and a prior history of pregnancy loss in the form of abortions or stillbirths, or neonatal death (P=0.051) depicted in Figure 05.

Table 13: Comparison of Significance of Variables in Relation to Postpartum PTSD in this Study Compared to Other Studies

	I	II	III	IV	V	VI
Demographic						
Age	N	N	N	N	N	
Education	N	Y	N	N		
Occupation	N	N				
Religion	N					
Residence	N					
Antenatal						
Whether planned	N	Y	Y	N		
Primi/Multi	N					
Comorbidities in antenatal period	N	Y				
No. of living issues	N	N	Y			
History of pregnancy loss/ neonatal deaths	Y			N		Y
Intrapartum						
Gestational age	N	Y	N	N		
Onset of labour	N					
Duration	N	Y	Y			Y
Mode of delivery	N	Y	Y	N	N	
Birth wt	Y	N	N	N		
Apgar at 1 min	N			Y		
Experience of control	N		Y	Y		
Perception of danger to self	Y				Y	Y
Perception of danger to baby	Y				Y	Y
Postpartum						
Experience of childbirth	N			N		
Spousal support	N		N			
ICU admission	Y					
NICU admission	Y	Y*		N		

N- not significant; Y-significant; I- Present study, India; II- Modarres et al⁷, Iran; III- AO Adewuya et al⁴, Nigeria; IV- T Henriques et al³, Brazil; V- Van Heumen MA et al¹³, Netherlands; VI- H Montmasson et al¹⁴, France; *morbidity

The question of whether the pregnancy was planned or unplanned seemed to have no bearing upon the occurrence of PTSD as seen in Table 08, unlike studies by Modarres et al⁷ and AO Adewuya et al⁴ which found unplanned pregnancies to have a greater association with PTSD. This could be because to many Indian women, the concept of planned pregnancy/unplanned pregnancy is yet to gain ground. In most parts of our country, women are resigned to the fact that they really have no say in timing their pregnancy.

Presence of comorbidities in the antenatal period and number of living issues were the other factors studied and found to be of no significance. Henriques et al³ found that women with three or more prior births had a twofold higher prevalence of PTSD postpartum than women with lesser children, possibly secondary to previous traumatizing birth experience. Since there are no subjects in our study with three living issues as shown in Figure 01, such an association could not be studied. Further studies or extending the study period might reveal such an association.

Studies have shown that preterm birth was a predictor for PTSD symptoms¹⁰. We found no significant association between gestational age and PTSD. However, significant negative correlation was found between birth weight of the neonate and total PCL-5 score ($P<0.05$), negative beliefs symptoms ($P<0.05$), hyperarousal symptoms ($P<0.05$) and avoidance symptoms ($P<0.05$) as shown in Table 09 and Table 12. Thus, the fact that our study has shown a

significant relation between low birth weight and PTSD (Table 09) and between NICU admission and PTSD (seen in Table 11, discussed below) could indirectly be applied here and thus babies who are born pre term with a higher risk of NICU admissions could indirectly be a predictor of PTSD.

Negative correlation was found between gestational age and avoidance symptoms and was statistically highly significant ($P<0.01$) as depicted in Table 12.

Duration of active labour was another variable which, while not being found to be significant in terms of occurrence of PTSD, was found to have a positive correlation to intrusion symptoms and was statistically significant ($P<0.05$) as shown in Table 12.

Other intrapartum details such as whether labour was induced or spontaneous, mode of delivery and Apgar score of the infant at 1 minute were not found to be significant. Soet et al found that emergency obstetric interventions such as emergency LSCS, manual removal of placenta and instrumental delivery were associated with higher prevalence of PTSD¹¹. Such an association could not be proved in our study. This is surprising. Many of the admissions in our hospital, which is a tertiary referral centre, are referred due to some complication. These women often require emergency obstetric interventions as shown in Figure 02. However, being amidst all the other high risk cases, and seeing most of the other women in almost a similar situation may have prevented them from perceiving the experience as stressful.

The subjective perception of danger to oneself during the process of delivery was found to be significant ($P<0.05$), while a subjective perception of danger to the baby had high statistically significant association with PTSD ($P<0.01$) as shown in Table 10.

The same correlation has been reported by studies by van Heumen¹³ in the Netherlands and H Montmasson¹⁴ in France. Poor maternal experience of control during delivery was not found to be a contributor towards developing PTSD unlike the studies by Adewuya et al⁴ and Henrique's et al³.

The postnatal factors studied included subjective experience of childbirth, perception of adequacy of spousal support, ICU admission of the mother and NICU admission of the neonate. Of these, ICU admission of the mother and NICU admission of the neonate were found to be significantly associated with development of PTSD postpartum ($P < 0.05$) as shown in Table 11 and Figure 06. This is similar to other studies.

Cerulli et al had found that postpartum PTSD was more prevalent in subjects who are victims of intimate partner violence¹². Although an attempt was made to study this factor, it could not be included in the final analysis as only one subject out of the 100 women was forthcoming with this history. She did not screen positive for PTSD. But Indian women for various social, familial and cultural reasons could be silent victims of domestic violence and may not come out with the facts.

Limitations and prospects

The sample size is moderate, it needs further study. The evaluation too can be extended upto 12 weeks postpartum.

Since this study mostly covers the urban population, the results cannot be extrapolated onto the whole Indian sub-continent where nearly 70% women live in rural areas.

This is a study conducted at a tertiary referral centre, thereby mostly receiving cases with some perinatal morbidity. As a result, the rate of low birth

weight babies is much higher (25%) in this study than in the general population. The Apgar score at 1 minute was < 7 in 23%. For this reason, these findings cannot be transposed onto the general population.

Domestic violence could not be studied as none of the subjects were open to this aspect of discussion. History of sexual abuse in the past was another factor that we attempted to study as it was found to be associated with higher prevalence of PTSD, but were unsuccessful at eliciting possibly in view of the sensitive nature of this topic.

Women who had had intrauterine fetal demise or neonatal death in this pregnancy were excluded from the study. This group would naturally have a higher rate of PTSD.

Conclusion

This study concludes that a mother could be predisposed to postpartum PTSD by perception of danger to herself, history of ICU admission postpartum, perception of danger to the baby, low birth weight and NICU admission of the baby. History wise, previous pregnancy loss could show a significant association. Among the women in whom these risk factors are found, prompt counseling and psychiatric reference could prevent adverse outcomes for both the mother and the baby, and improve the overall health and interpersonal bonding in the family. It can also positively influence her future obstetric career.

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