

Mode of Delivery and Post-partum Depression: A Cohort Study

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Abstract

Objective: Postpartum depression (PPD) and postpartum anxiety have serious complications on the mother and the infant. Multiple risk factors are associated with PPD and anxiety, namely Mode of delivery, in this study we aimed to examine the association of delivery mode and these disorders.

Methods: In this cross-sectional study 250 women were recruited from the delivery ward of Valiasr hospital at Imam Khomeini hospital Complex, Tehran, Iran. Depression and anxiety were measured using the Edinburg Postnatal Depression Scale (EPDS). Mode of delivery, health related and demographic data were also assessed. Data was analyzed on SPSS v19 software.

Results: Overall prevalence of PPD was 23.2% (25% in CS and 18.3% in NVD) and prevalence of anxiety was 23.6% (22.9% CS and 25.4% in NVD). Our findings did not show any significant relationship between mode of delivery and PPD or anxiety. Whereas other factors such as previous history of mood disorders and depressed mood immediately after delivery and suicidal thoughts were significantly associated with PPD and Anxiety.

Conclusion: Mode of delivery was not significantly associated with Post-partum depression or anxiety, 3 most important risk factors were: a history of mood disorder, early depressive mood postpartum, and suicidal thoughts.

Keywords: Postpartum depression; Postpartum anxiety; Obstetric complications

Introduction

Depression among women in child bearing years can be of major concern [1]. Furthermore pregnancy and childbirth are associated with various changes which could lead to psychiatric disorders in genetically or psychosocially vulnerable mothers [2]. Post-partum depression and Post-partum anxiety are of these disorders. The prevalence of these disorders varies among different communities but it is similar to that of normal population and is around 8-15% [3]. The major difference between Post-partum depression and the commonly known depression is the time frame in which it occurs. According to DSM 4 this is a major depressive disorder occurring within 4 weeks of delivery [4,5], however it should be stated that the incidence of mood disorders is highest during the first 90 days after delivery, sometimes taking as long as a year [6]. More attention should be given to these disorders as they can cause subsequent sequels both on the mother and the child [7]. Infants of mothers with Post-partum depression (PPD) have been associated with problematic behavior and lower competencies for interactions and developmental issues [5,8]. Many factors have been implicated as predictors such as: antenatal depression, previous depressive history, major life events and many more [4,9], although less attention has been given to obstetric factors like mode of delivery. As statistics reveal Caesarian section is increasing by 60% and there has been some evidence suggesting an association with psychiatric disorders [10]. Various studies have investigated the link between postpartum depression and mode of delivery but the evidence has been conflicting, with some showing association [11,12] and others not [5,8,13,14].

Of the common tools used for the screening of depression has been the Edinburg Post natal Depression Scale (EPDS), although it should be noted that this scale is not a diagnostic tool but in case of a score above 13 is highly suggestive of depression and warrants further investigation [15]. This tool is also used to assess anxiety with a score of over 6 on

questions 3 to 5 implicating anxiety. For Iranian population the above mentioned scale has been validated and is therefore suitable [16].

Aim of the Study

We aimed to compare the rates of Post-partum depression and anxiety in women undergoing natural vaginal delivery (NVD) and Caesarian section and evaluate some of the possible factors associated with the these disorders.

Materials and Methods

The data for the analysis were collected from the delivery ward of Valiasr hospital, IKHC, Tehran, Iran and the study aimed to examine the relationship between Mode of delivery and Post-partum depression and Anxiety as well as related factors.

Participants

Participants were all the women giving birth to a singleton live infant who were literate in farsi language at Valiasr hospital of Imam Khomeini Hospital Complex, Tehran, Iran. 292 women were initially recruited, of these 42 were excluded due to not fully completing the questionnaires or were lost in follow up. The final analysis was performed on 250 women. Taking the statistics of different modes of delivery we estimated a 3 to 1 ratio of Caesarian section to NVD,

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therefore 70% of the data were from those who had Caesarian section and the remaining 30% was from the NVD.

Method

After explaining the purpose of the study and filling a written consent form and assuring the mothers on confidentiality, the researcher (a final year medical student) would ask the participant to complete a self-report questionnaire in the hospital. The questionnaire includes 3 parts:

- Socio-demographic data including: age, education, employment status, number of children, and newborn's gender and mode of delivery
- Health related data: health problems in the infants requiring hospitalization, addiction in the mother, history of mood disorders in the participant, family history of mood disorders, history of previous Post-partum depression, psychiatric medication history, and mother's preference on labor mode.
- EPDS: the farsi version of the EPDS validated in Iran which consists of 10 items. A total score of <9 is considered mildly depressed, a score of 10-12 is moderately depressed and a score of >13 is severely depressed. Also a score of above 6 on questions 3, 4, 5 is considered anxiety.

At 4-8 weeks following discharge the participants were contacted to complete the EPDS one more time and the answers were recorded, the scoring system was same as aforementioned and a score of above 13 would be suggestive of Post-partum depression. On both interviews in case of a suicidal thought (question number 10 on the EPDS) or severe depression the patient would be referred to a psychiatrist for further evaluation.

Measures

The primary outcome variables were Post-partum depression and anxiety and their association with mode of delivery. Data was analyzed using SPSS v17 software.

Results

250 women were included in the study. Of these 71.6% underwent Caesarian section and 28.4% were NVD.

The mean age was 27.3; the total rate of depression was 23.2%, which consisted of 25% and 18.3% in Caesarian section and NVD respectively.

The rate of anxiety was also measured. The overall rate was 23.6%, consisting of 22.9% in Caesarian section and 25.4% in the NVD.

The two groups (Caesarian section and NVD) were not significantly different in terms of the demographic as well as health related variables and were therefore matched.

Demographic data including age, employment status, education, number of children, child's gender are demonstrated in Table 1.

Health related data such as history of mental illness in the person or the family, history of previous Post-partum depression, addiction status, psychiatric medication history, child's admission due to physical problems, mother's preference on the labor mode and early post-delivery depression are shown in Table 2.

As shown in Table 3, Comparing the EPDS scores in both groups showed that although depression rate was higher in the Caesarian section group (25.1% vs. 18.3%), but the difference was not statistically significant and therefore there is no association between mode of delivery and Post-partum depression (P value = 0.49). Post-partum anxiety was also analyzed in both modes of delivery which showed no significant difference (P value = 0.74).

Nevertheless there were some other variables associated with these disorders. Regarding Post-partum depression none of the demographic data were associated with the disorder. In the health related variables previous mood disorder in the mother, family history of mood disorders, mother's addiction and early depressive mood after delivery were all associated with Post-partum depression.

As for anxiety, previous depressive history, history of psychiatric medication use, and early depressive mood after delivery were significantly associated with anxiety (Tables 4 and 5).

Also we evaluated if a repeated caesarian section could be associated with postpartum depression which showed no significant association. The above mentioned results are demonstrated in Tables 4 and 5.

In this study we also evaluated if having suicidal thoughts (question 10 in the EPDS questionnaire) and PPD or anxiety are associated. As shown in Table 5, both PPD and anxiety show significant association with suicidal thoughts.

Discussion

This study found no association between mode of delivery and Post-partum depression or anxiety. Although the rate of Post-partum depression was higher in women who underwent caesarian section compared to NVD but this difference was not statistically different.

| Characteristic | Vaginal delivery (n = 71) | Caesarean section delivery (n = 179) | Total (n = 250) | P value |
|--------------------------------|---------------------------|--------------------------------------|-----------------|---------|
| Age in years (mean ± SD) | 26.5 ± 5.9 | 27.7 ± 5.1 | 27.3 ± 5.4 | 0.11 |
| Employment status n (%) | | | | |
| Housewife | 63(88.7) | 168(93.5) | 231(92.4) | 0.16 |
| Working | 8(11.3) | 11(6.1) | 19(7.6) | |
| Education | | | | |
| Undergraduate | 37(52.1) | 96(53.6) | 133(53.2) | 0.51 |
| Highschool graduate | 31(43.7) | 96(38.5) | 100(40) | |
| University graduate | 3(4.2) | 14(7.8) | 17(6.8) | |
| Newborn's gender | | | | |
| Boy | 33(46.5) | 96(53.6) | 129(51.6) | 0.3 |
| Girl | 38(53.5) | 83(46.4) | 121(48.4) | |
| Number of children | 1.92 ± 0.9 | 1.93 ± 0.7 | | 0.88 |

Table 1: Demographic data of the participants. Participant's age and number of children were compared by means (t-test) while employment status, education and child's gender were compared by ratios (Chi square).

| Health related data | Vaginal delivery (n = 71) n (%) | Caesarian section delivery (n = 179) n (%) | P value |
|---|------------------------------------|--|---------|
| History of mental illness in the mother | | | |
| Positive history | 8(11.3) | 17(9.5) | 0.64 |
| None | 63(88.7) | 162(90.5) | |
| History of mental illness in the family | | | |
| Positive history | 6(8.5) | 159(88.8) | 0.1 |
| None | 65(91.5) | 20(11.2) | |
| History of psychiatric medication use | | | |
| History of medication use present | 2(2.8) | 16(8.9) | 0.1 |
| None | 69(97.2) | 163(91.1) | |
| History of previous postpartum depression | | | |
| Positive history | 6(8.5) | 6(3.4) | 0.1 |
| None | 65(91.5) | 173(96.6) | |
| Child's admission due to physical problems | | | |
| Admitted | 8(11.3) | 19(10.6) | 1 |
| At home | 63(88.7) | 160(89.4) | |
| Addiction status | | | |
| Addicted | 3(4.2) | 1(0.6) | 0.07 |
| Not addicted | 68(95.8) | 178(99.4) | |
| Early depressive mood after birth | | | |
| positive | 21(29.5) | 51(28.5) | |
| negative | 50(70.5) | 128(71.5) | |

Table 2: Health related data of the participants. The data were compared by ratios (Chi Square).P value of <0.05 was significant.

| Characteristic | Vaginal delivery (NVD) | Caesarian section (CS) | P value |
|------------------------|------------------------|------------------------|---------|
| Post-partum depression | 13(18.3%) | 45(25.1%) | 0.49 |
| Post-partum anxiety | 18(25.3%) | 41(22.9%) | 0.74 |

Table 3: The relationship between mode of delivery and PPD and Anxiety. P value of <0.05 was considered significant.

| Factor | Post-Partum Depression | P value | Post-Partum Anxiety | P value |
|--|------------------------|---------|---------------------|---------|
| Demographic data | | | | |
| Age | | | | |
| <20 | 1(5%) | 0.148 | 3(16.6%) | 0.67 |
| 20-30 | 43(26.8%) | | 36(22.5%) | |
| 30-40 | 12(17.3%) | | 18(26) | |
| Employment status | | | | |
| working | 4(21%) | 0.11 | 54(23.3%) | 0.78 |
| housewife | 54(23.3%) | | 5(26.3%) | |
| Education | | | | |
| Undergraduate | 33(24.8%) | 0.75 | 33(29.3%) | 0.065 |
| High school degree | 21(21%) | | 18(18%) | |
| University degree | 4(23.5%) | | 2(11.7%) | |
| Child's Gender | | | | |
| Boy | 32(24.8%) | 0.57 | 30(23.2%) | 1 |
| Girl | 26(21.4%) | | 29(23.9%) | |
| Number of children | | | | |
| First Pregnancy | 19(18.8%) | 0.67 | 17(16.8%) | 0.097 |
| 1 child | 22(23.6%) | | 22(23.6%) | |
| 2 children | 14(29.7%) | | 17(36.1%) | |
| 3 children | 2(25%) | | 3(37.5%) | |
| 4 children | 1(100%) | | 0(0%) | |
| Health related Data | | | | |
| History of mental illness in the mother | | | | |
| Positive history | 10(40%) | 0.004* | 10(40%) | 0.042* |
| None | 48(21.3%) | | 49(21.7%) | |
| History of mental illness in the family | | | | |

| | | | | |
|---|-----------|--------|-----------|--------|
| Positive history | 11(42.3%) | 0.027* | 7(26.9%) | 0.41* |
| None | 47(20.9%) | | 52(23.2%) | |
| History of psychiatric medication use | | | | |
| History of medication use present | 7(38.8%) | 0.07 | 8(44.4%) | 0.036* |
| None | 51(21.9%) | | 51(21.9%) | |
| History of previous postpartum depression | | | | |
| Positive history | 4(33.3%) | 0.084 | 4(33.3%) | 0.3 |
| None | 54(22.6%) | | 55(23.1%) | |
| Child's admission due to physical problems | | | | |
| Admitted | 9(33.3%) | 0.24 | 10(37%) | 0.071 |
| At home | 49(21.9%) | | 49(21.9%) | |
| Addiction status | | | | |
| Addicted | 3(75%) | 0.036* | 1(25%) | 1 |
| Not addicted | 55(21.4%) | | 58(23.5%) | |
| Early depressive mood after birth | | | | |
| Positive | 35(48.6%) | 0.000* | 28(54.9%) | 0.000* |
| Mildly Depressed | 8(20%) | | 9(34.6) | |
| Not Depressed | 15(10.9%) | | 4(3%) | |
| Other factors | | | | |
| Mode of delivery and mother's preference | | | | |
| Same | 30(21.2%) | 0.57 | 34(24.1%) | 0.47 |
| Different | 28(25.6%) | | 25(22.9%) | |
| Repeated Caesarian section | 32(28.5%) | 0.31 | 12(17.9%) | 0.27 |

*P value of below 0.05 shows significant difference between two groups.

Table 4: Association of other factors with PPD and anxiety.

| Suicidal thoughts | PPD | P value | Post-partum anxiety | P value |
|-------------------|------------|---------|---------------------|---------|
| Present | 16 (53.3%) | 0.000* | 15 (50%) | 0.001* |

*P value of <0.05 is considered significant.

Table 5: Association of PPD (Post-Partum depression and Post-Partum Anxiety with suicidal thoughts.

The rate of Post-partum depression in our study was 23.2% (23.8% in caesarian section and 18.3% in NVD) and the prevalence rate of anxiety was 23.6% (25.4% and 23% in NVD and caesarian section, respectively).

The prevalence rate in current survey was a little bit higher than previous studies.

In a study held by Sword et al., which also used the EPDS but with a cut-off score of 12, showed 7.6% Post-partum depression [5]. Kheirabadi et al. conducted a study in Iran, which showed the prevalence rate of 20.1%, but with a cut off score in EPDS of 12 rather than 13 which was closer to our findings and could be justified by cultural similarities [4].

It should be noted that in the Iranian version of EPDS the validated cut off score is 13 [16].

Our results are consistent with other recent studies [4,5,17]. A study by Eisenach which has also compared the two methods of delivery in terms of depression showed that the pain after delivery and not the mode of delivery is associated with Post-partum depression, but this study did not evaluate the patients for prenatal depression which is a known risk factor for Post-partum depression [14].

A Meta-analysis by Carter et al. investigated the relationship between Caesarian section and Post-partum depression. This study evaluated 24 studies that have examined this relationship and it could not reveal a significant association between Caesarian section and postpartum depression. This study showed that superior studies did not find any association between Caesarian section and PPD. While the other studies which marked significant correlation, were either

small sample sized ones or were methodologically weak [8]. Several studies have indicated that there is no need to select a special method of delivery for an individual with previous depressive history and that there is no association between these two [18].

One of the studies suggesting an association between method of delivery and PPD is the study conducted by Yang et al. which examined the association of mode of delivery and seasonal variation with PPD and showed significant association between these variables and PPD. The reason for this association has been said that Caesarian section is accompanied with more re-hospitalization and therefore more psychological problem [19], another study which was conducted in Iran by Torkan et al. also had examined the quality of life after both types of delivery, this study used the EPDS and SF-36 and a special questionnaire to assess the quality of life, the study showed that the EPDS scores were higher in the Caesarian section group 6-8 weeks Post-partum and susceptibility to depression was significantly higher in the Caesarian section group [10]. The latter study suggested encouragement towards NVD and supports positive attitude towards NVD. The sample size of the mentioned study was small and only included 100 participants (50 Caesarian sections and 50 NVD).

In the current study we found some of the variables to be associated with the assessed disorders. In terms of both anxiety and depression a previous history of mood disorder and early depression after delivery (first day post-partum) were demonstrated to be associated with the disorders. This results are consistent with several other studies, Kheirabadi et al. investigated the risk factors of PPD in Iranian population and revealed that past history of depression is

very important in screening women who may be at risk of post natal depression [6,13,20,21].

Considering early depression after labor there has also been some evidence suggesting the association, which can be of great value in preventing further progression of the disorder and may be amenable to change and can be a possible target for intervention.

A history of mood disorders in the family and mother's addiction were also significantly associated with PPD, this too has been mentioned in several studies and is almost a known risk factor for PPD [4].

As for anxiety a history of psychiatric medication was shown to be associated with the disorder in our study, which could be due to a withdrawal symptoms or even an adverse effect of the medications used, this factor has not been to our knowledge investigated in any studies and needs further evaluation.

We also measured the association of suicidal thoughts with PPD and Anxiety, which showed a strong relation. By this it could be suggested to beware of signs of PPD and anxiety in mothers experiencing suicidal thoughts and follow them more closely in order to prevent further mental and physical consequences.

Of the measures that could be undertaken for the mothers is to collaborate care managers (trained nurses) to provide them with necessary information, help them overcome their condition and aid in self-management skills and life style changes as a bridge between the physician and the patient, as done for many other chronic conditions [22]. There were limitations to this study as well. One is that the questionnaire was only filled by the mother's knowledge alone which could make errors in the previous conditions of the mother, such as previous depression. Second is that the follow-up interview was conducted over the phone which may cause bias in the answers as it is better to have eye to eye contact while interviewing someone.

It could be suggested to include other factors in the assessment of PPD as well, such as diet during pregnancy, many studies have been evaluating the issue and have had compelling results, prescribing a healthy diet enriched in DHA and other components to reduce the risk of PPD [23-25]. Also The sample size of the study was good but it would be beneficial to conduct a bigger multi-center study to enroll different social classes in the study and evaluate the impact of their income or quality of life on the prevalence of PPD or anxiety as it is a big concern for new mothers, the cost of raising children and having a safe and comfortable household.

Conclusion

The above findings reveal that there is no difference regarding psychiatric disorders between the two modes of delivery, therefore no limitation faces women who are considering an alternative. Ultimately it can be suggested that women who have a history of mood disorder or appear depressed early after labor or have suicidal thoughts be screened for depression and if necessary proper treatment started in order to overcome the later more serious complications.

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