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Psychological impact of Covid - 19 among mothers during perinatal period: An exploratory study

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Abstract

Background: Maternal mental health is a public health concern especially during COVID pandemic. Essential regular Maternity services are affected due to lockdown and fear of its spread. COVID 19 had its psychological impact among general public and also among perinatal mothers. Psychological problems impact perinatal mothers, and are associated with increased risk to mother and the child.

Objectives: To study the prevalence of depression, anxiety and stress among perinatal mothers delivering at a tertiary hospital. To compare these levels between COVID positive and negative mothers

Methodology: A case control study among 150 COVID positive and 150 COVID negative antenatal and postnatal mothers in a tertiary hospital. Interview schedule including DASS-21 was administered to assess the levels of depression, anxiety and stress among them. Grades of depression, anxiety and stress were correlated with each other and compared with age and pregnancy status of mothers both among cases and controls.

Results: Proportion of some grade of depression 96 (64.0%) among COVID cases was lesser 107(71.3%) than that of controls. Anxiety prevalence was slightly higher among cases 81(54.0%) than compared to controls 78 (52.0%). Prevalence of stress among cases 29(19.3%) and controls 28 (18.7) were similar. Mean depression scores among cases were 10.05 ± 5.10 was significantly lesser than that of controls which is 11.44 ± 4.92 . There was no association between psychological problems with age and pregnancy status both in cases and controls. There was a significant positive correlation between the scores of depression, anxiety and stress both among cases and controls.

Conclusions: COVID pandemic has a significant psychological impact on all pregnant mothers irrespective of their COVID status. This emphasises the need for prompt and early assessment and management of maternal mental health among all pregnant mothers during COVID pandemic.

Keywords: COVID - 19, mental health, pregnancy, postpartum, anxiety, depression, stress

Introduction

Corona virus is a novel version of SARS-CoV-2 has presented with pandemic potential affecting almost 220 countries leading to COVID 19 disease [1]. Till mid December 2020, World health Organization (WHO) has reported 7.08 Crore of confirmed cases of COVID-19, including 16.05 Lakh deaths worldwide [2]. In India 97 lakh cases are confirmed and 1.43 lakh succumbed to death until the same period [3].

As COVID 19 is a highly contagious disease, the major prevention strategies involved are wearing personal protective equipments like masks, hand washing, physical-distancing and self-isolation [4]. Larger population was restricted to their homes, owing lockdowns and containment strategies implemented in the nation for preventing disease transmission. COVID-19 pandemic has given rise to few stigmatizing factors like isolation, quarantine, discrimination and marginalization [5]. The constant flow of readily available information about the COVID-19 leading to mass hysteria, panic and psychological problems in public from all the levels of socioeconomic status [6]. Health crime originated out of the fear of being corona positive has also been reported from India [7]. The impact of the physical distancing and isolation on mental health is anticipated to be high, and may disproportionately affect high risk populations.

As a part of prevention strategies of COVID-19 and to rationalize manpower for working in isolation ward, the Government of India had issued guidelines to stop regular OPDs and elective surgeries. But it is to be noted that, the regular Maternity services are absolutely essential and are inevitable. In addition to the above factors and pregnancy itself presents an additional period

of uncertainty, the challenges in health care delivery like getting appointments, virtual consultation has made the maternal woman more vulnerable for mental health related issues.

Maternal mental health is a public health concern. Commonly experienced symptoms of puerperium are feeling sad and hopeless, negative thoughts about themselves, not sleeping well, lack of interest or pleasure in doing things or being with people and loss of appetite. The psychological illness extends as postpartum depression which encompasses disorders ranging in severity from baby blues to postpartum psychosis with onset of episodes within 4–6 weeks after birth.

COVID-19 pandemic resulted in an increased amount of depression, anxiety and stress in the general population in India and other countries [8-11], and this is likely to be even more so for pregnant women and their families [1]. Irrespective of maternal woman acquiring COVID-19 infection, the pandemic has increases the risk of depression, anxiety and stress, among maternal women.

Psychological problems impact one in seven women during the perinatal period, and are associated with increased risk of preterm delivery, reduced mother-infant bonding, and delays in cognitive development of the infant, which may persist into childhood [12-14]. Prevention and treatment is critical yet it is estimated that 50% of women who are depressed remain undiagnosed during and following pregnancy [15]. Furthermore, the COVID-19 pandemic is anticipated to decrease access to diagnosis and psychological or pharmacological treatment; this is likely exacerbating poor mental health [7, 16].

There is dearth of research on maternal mental health during COVID pandemic in India especially among COVID positive perinatal mothers. It is critical to understand the effect of COVID pandemic on perinatal health to implement policies for promotion of maternal mental health. Hence we conducted this study with the objectives to study the prevalence of depression, anxiety and stress among perinatal mothers delivering at a tertiary hospital. To compare these levels between COVID positive and negative mothers

Methodology

It was a cross sectional study done among COVID-19 positive mothers during their perinatal period. Study population included all mothers admitted for delivery in the month of **July to October 2020**.

Sample size and sampling: To estimate a odds ratio of 3.89 of with a prevalence of depression among pregnant mothers during COVID era being 40.7% and that pre COVID era being 15.0% (1), with 99% confidence levels and 90% power, we have to study a minimum of 96 perinatal mothers in each group. However we have studied 150 mothers in each group. Sample frame included all mothers admitted in Obstetrics department for delivery of the baby. Because of COVID pandemic, it is a mandate that all antenatal mothers undergo COVID testing before admission; mothers without COVID testing were excluded from the study. All COVID positive mothers were

asked about the history of any psychiatric illness in the past and mothers with such history were also excluded from the study. Totally 150 mothers with COVID positive and COVID negative results were randomly selected as cases and controls.

Study Tool

An interview schedule was collected from each study subject about Sociodemographic details, pregnancy details and psychological problems. DASS 21 scale was administered to assess depression, anxiety and stress among mothers. The DASS-21 is a 21-item self-reported questionnaire designed to measure a range of three subscales (depression, anxiety, and stress). The scale contains three subscales that cover depression (7 items), anxiety (7 items), and stress (7 items). Each item is scored from 0 (at all) to 3 (very much). Therefore, the total score of each subscale ranged 0–21. Because the DASS-21 is short form version of DASS (the long form has 42 items), the final score of each subscale needs to be multiplied by two (x2). The following cut off score is used to assess the presence of the symptoms: Depression ≥ 10 , anxiety ≥ 8 , and stress ≥ 15 [17]. This scale has proven good validity and utility across various cultures and languages. A valid Tamil version of DASS-21 was used in the study [18-19].

Quality Assurance

The study was conducted after approved by the Institutional Ethical Committee. Informed written consent was obtained from all the participants. A pilot study was conducted to validate content and understanding, suitable changes were made. Interviewers were trained to administer the questionnaire so that uniformity is maintained during interview

Statistical Analysis

Data was entered in Microsoft excel and analysed using Epi info-08 software. Descriptive statistics were conducted for the socio demographic variables, pregnancy status and DASS scores for depression, anxiety and stress. Difference between two proportions was calculated using two tailed chi square test with a significant level of $p < 0.05$. Correlation between depression, anxiety, stress scores and age was checked and Pearson correlation coefficient was estimated.

Results

Mean age of cases was 25.31 ± 4.47 years with a minimum and maximum of 18 and 33 years respectively. Majority of cases 98 (65.33%) were in the age group of 21-30 years. 91 (60.67%) cases were in their antenatal period and 59 (39.33%) were in their postnatal period. Mean age of controls was 25.10 ± 4.10 years with a minimum and maximum of 18 and 33 years respectively. Majority of controls 110 (73.3%) were in the age group of 21-30 years. 97 (64.7%) controls were in their antenatal period and 53 (35.3%) were in their postnatal period. Baseline characteristics were similar between cases and controls which is comparable.

Table 1: Grades of depression, Anxiety and stress among study population

| Grades | Depression N (%) | | Anxiety N (%) | | Stress N (%) | |
|------------------|------------------|-----------|---------------|-----------|--------------|------------|
| | Cases | Controls | Cases | Controls | Cases | Controls |
| Normal | 54 (36.0) | 43 (28.7) | 69 (46.0) | 72 (48.0) | 121 (80.7) | 122 (81.3) |
| Mild | 54 (36.0) | 47 (31.3) | 36 (24.0) | 5 (3.3) | 21 (14.0) | 19 (12.7) |
| Moderate | 41 (27.3) | 56 (37.3) | 24 (16.0) | 51 (34.0) | 5 (3.3) | 5 (3.3) |
| Severe | 1 (0.7) | 4 (2.7) | 17 (11.3) | 14 (9.4) | 3 (2.0) | 4 (2.7) |
| Extremely severe | 0 (0) | 0 (0) | 4 (2.7) | 8 (5.3) | 0 (0) | 0 (0) |

Table 1 shows the grades of among study population. Proportion of some grade of depression 96 (64.0%) among COVID cases was lesser 107 (71.3%) than that of controls. Anxiety prevalence was slightly higher among cases 81 (54.0%) than compared to

controls 78 (52.0%). Prevalence of stress among cases 29 (19.3%) and controls 28 (18.7) were similar. Overall combined proportion of depression, anxiety and stress among both the groups was found to be 67.7%, 53% and 19% respectively.

Table 2: Comparison of depression, anxiety and stress scores among study population

| Psychological factors | Cases | Controls | t value | p value |
|-----------------------|------------|------------|---------|---------|
| | Mean ± S.D | Mean ± S.D | | |
| Depression score | 10.05±5.10 | 11.44±4.92 | -2.4 | 0.017 |
| Anxiety Score | 8.76±5.48 | 8.91±5.85 | -0.22 | 0.822 |
| Stress Score | 9.97±5.68 | 10.44±5.87 | -0.7 | 0.484 |

Table 2 shows Comparison of depression, anxiety and stress scores among study population. Mean depression scores among cases were 10.05±5.10 which falls in the mild depression category and significantly lesser that of controls which is 11.44±4.92. Mean anxiety scores among cases were 8.76±5.48

which falls in the mild anxiety category which is almost similar to that of controls which is 8.91±5.85. Mean stress scores of cases were 9.97±5.68 which falls into normal category and similar to those of controls which is 10.44±5.87.

Table 3: Association of depression, anxiety and stress with certain characteristics

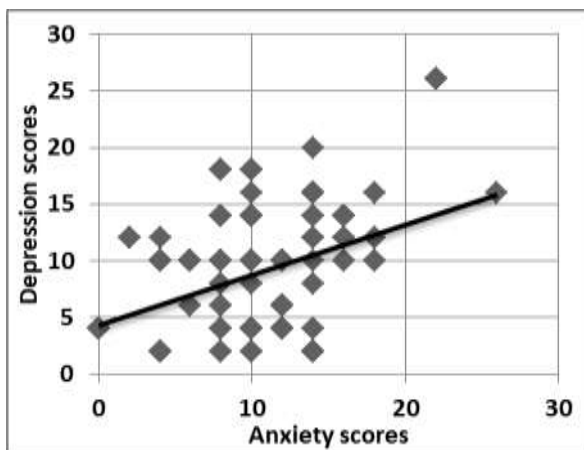
| Characteristic | Depression N (%) | | Anxiety N (%) | | Stress N(%) | |
|----------------|------------------|-----------|---------------|-----------|-------------|-----------|
| | Cases | Controls | Cases | Controls | Cases | Controls |
| ≤20yrs | 16 (61.54) | 15 (60) | 15 (57.69) | 15 (60) | 3(11.53) | 2 (8.0) |
| 21-30 yrs | 66(67.34) | 79 (71.8) | 52 (53.06) | 56 (50.9) | 19 (19.39) | 23 (20.9) |
| >30 yrs | 14(3.85) | 13 (86.7) | 14 (53.85) | 7 (46.7) | 7 (26.92) | 3 (20.0) |
| Antenatal | 62 (68.13) | 72 (74.2) | 45 (49.45) | 51 (52.6) | 19 (20.88) | 18 (18.6) |
| Postnatal | 34(57.63) | 35 (66.0) | 36 (61.02) | 27 (50.9) | 10 (16.95) | 10 (18.9) |

Table 3 shows the association of depression, anxiety and stress with age and pregnancy status. Prevalence of depression was higher among 21-30 year age group, anxiety among ≤20 years and stress among >30 year old mothers compared to other age groups among cases. Prevalence of depression was higher among >30 year age group, anxiety among ≤20 years and stress among 21-30 year old mothers compared to other age groups

among controls. Depression and stress was higher among antenatal mothers and anxiety among postnatal mothers among cases compared to other group. Depression was higher among antenatal mothers and anxiety and stress among postnatal mothers among controls compared to other group. However there was no statistical significance observed for the difference.

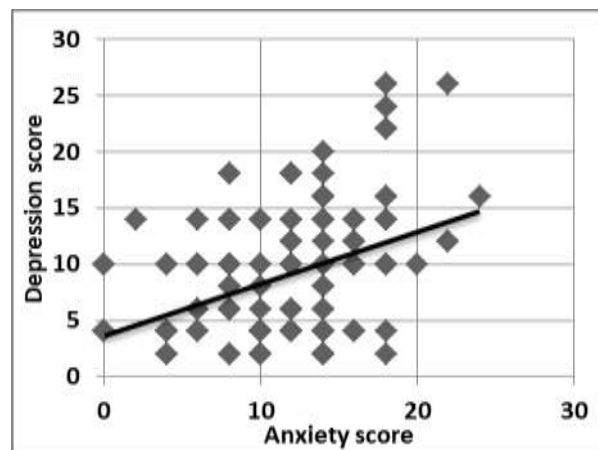
Cases

a) $r = 0.409, p < 0.001$



Controls

b) $r = 0.386, p < 0.001$



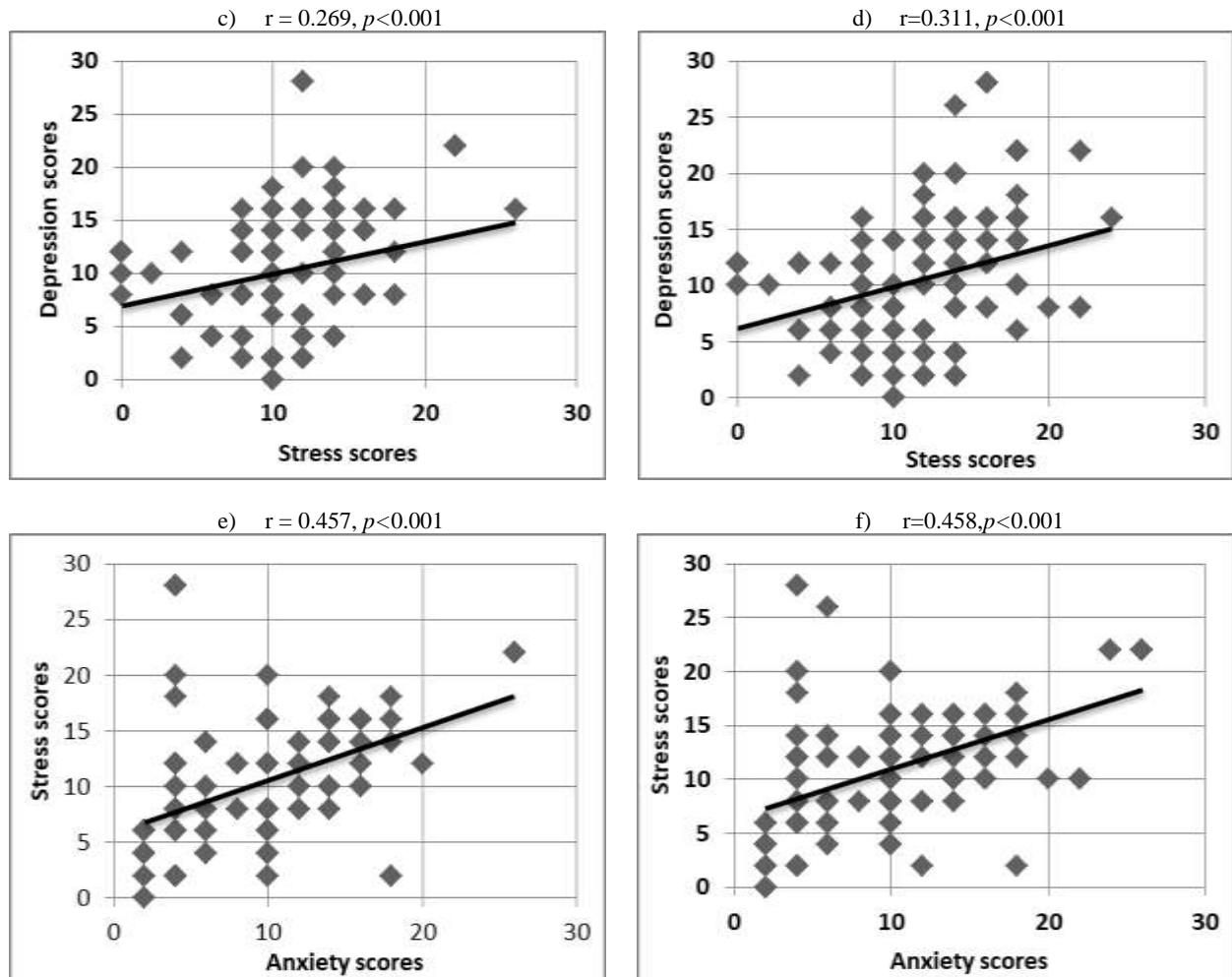


Fig 1: correlation between depression, anxiety and stress scores among study participants

Figure 1 shows correlation between depression, anxiety and stress scores among study participants. There is a significant positive correlation between the scores of depression, anxiety and stress both in cases and controls. Age had no correlation with depression, anxiety and stress scores both in cases and controls.

Discussion

The results of this study have shown high levels of self-reported levels of depression, anxiety and stress in all pregnant mothers. Stress levels being lesser compared to that of Depression and anxiety levels. Davenport *et al.* reported a significant increase in self-reported levels of depression and anxiety in pregnant women from before to during the COVID-19 pandemic [1]. In a study on depression and anxiety among pregnant mothers conducted in China showed that pregnant women report higher levels of anxiety and depression during the pandemics compared to before [20]. Studies have reported the concerns about health of their family and unborn children, as well as anxiety regarding behavioural changes such as social-isolation, working remotely, transport difficulties, childcare and assimilation of daily supplies [21].

A cross-sectional study of 100 pregnant women from Italy found a moderate-to-severe psychological impact of the COVID-19 pandemic and highlighted the need for intervention to improve the mental health of this population [22].

In our study combined proportion of depression, anxiety and stress among both the groups was found to be 67.7%, 53% and 19% respectively. In a study done among pregnant mothers in

Iran showed a lower prevalence of depression (32.7%), and anxiety (32.7%), and a higher prevalence of stress (43.9%) levels. Berthelot *et al.* and Durankus *et al.* also showed that pregnant women had higher levels of stress, and lower levels of anxiety, and depression during the COVID-19 pandemic compared our study results [23-24]. A possible reason for this difference may be the cultural and social discrepancies between the study settings. Varshney *et al.* in his study on Indian general population shows that 33.2% had psychological impact regarding COVID-19 [9]. Wang *et al.* in china reported 53.8% of respondents suffered a psychological impact from the pandemic [8].

When depression, anxiety and stress levels were compared between COVID positive and COVID negative mothers there was no difference in the levels. Similar results was observed in a pilot study done by Kotabagi *et al.* [25] where there was no difference in the anxiety and depression levels between COVID 19 positive and non COVID pregnant mothers. The data from our study indicate that depression, anxiety and stress levels were high among both COVID 19 positive and non COVID pregnant, suggesting that the of the pandemic affected pregnant women equally irrespective of their COVID status.

Psychological problems like depression, anxiety and stress are known to cause acute problems like preterm delivery, Intra uterine growth retardation and long-term consequences like increased risk of future anxiety stress and depression, cognitive delays for the baby [12-14]. The consequences of undiagnosed and untreated depression are serious; nearly 20% of women with postpartum depression have considered hurting themselves and

in the UK, the leading cause of maternal death in the year following delivery is suicide [26]. There is enough evidence that psychological distress during pregnancy can lead to untoward negative outcomes like lower birth weight, preterm delivery, alterations in brain development, and poorer cognitive development [27, 28]. Hence treatment of depression, stress and anxiety is critical to support the health of both mother and child also many women are reluctant to seek professional help and take antidepressants even when prescribed [29, 30].

According to available sources, this study is the first to investigate the depression, stress and anxiety of Indian perinatal women and compare the levels of COVID positive and non COVID perinatal mothers. There are only two studies one looking at the Impact of corona virus on pregnant females where psychological status of 103 pregnant mothers were studied and showed a higher prevalence of stress and anxiety [31]. Nanjundaswamy *et al.* has conducted a survey among Obstetricians on COVID-19 related anxiety and concerns expressed by pregnant and postpartum women and they opined that there is an urgent need for resources such as videos, websites and counselling skills to handle COVID-related anxiety among perinatal women [32].

Though a lot of vital information is gathered from this study, data collected from this study can only give associations and causative relationships cannot be determined. Numerous factors like financial stresses, non supportive family, lack of entertainment and social isolation other than COVID-19 disease may influence likelihood of depression, stress and anxiety. Our population was primarily from Tamilnadu middle and low socio-economic group, studies involving diverse population may support in generalization of the results. Authors recommend detailed qualitative study to understand the causes of depression, anxiety and stress among pregnant mothers will help in planning programs in promoting maternal mental health.

The results of this study have shown high levels of self-reported levels of depression, anxiety and stress in all pregnant mothers irrespective of their infective status during the COVID-19 pandemic. These findings support the strong need for heightened identification and management of maternal mental health problems. The study emphasizes on possible interventions to maintain mental health among pregnant and postpartum mothers during the challenging times of COVID pandemic where access to diagnosis and treatment is difficult. Its crucial to concentrate on the potential effects of the pandemic on the maternal mental health. Antenatal care is currently conducted virtually or less than the recommended times where some important diagnosis may be missed. It is vital that health workers involved in maternal care make conscious efforts to inquire about anxiety, depression and stress during consultations, so that they are supported in time.

Conclusion

Even though there is plenty of scientific evidences and experience-based knowledge in several fields from the previous two coronaviruses, the research on MERS-CoV and SARS-CoV and pregnancy/childbirth is still limited, especially in terms of maternal mental health. There is a critically important gap in our knowledge about how pandemics affect mothers and their babies, and how pregnant women, mothers and their families can be better supported. In February 2020, several reports were published in The Lancet stating that mental health care should be included in the national public health emergency systems and that further understanding was needed to better respond to future unexpected disease outbreaks [33, 34, 35, 36]. Prenatal and postnatal

mental health should be prioritised due to its pervasive short and long-term impacts on maternal, familial and fetus, infant and child biopsychosocial development.

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