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Post-COVID symptoms and health-related quality of life in extended postpartum period

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ABSTRACT

Background: COVID-19 pandemic has remarkable effect not just on physical health, but also on psychological state and overall quality of life (QoL). It affected all the section of community including vulnerable section of pregnant females and children. **Aims and Objective:** The aim of the study was to assess health-related QoL in recovered COVID-19 positive pregnant females in their extended postpartum period along with insight into prevailing post-COVID symptoms in this population. This was a cross-sectional and questionnaire-based study conducted in Kota, Rajasthan, India. **Materials and Methods:** This study was conducted on 173 admitted females between March 1, 2021 and June 30, 2021 who were pregnant and contacted COVID-19 infection at any point of their antenatal/intrapartum period. The questionnaire included details related to demographics, symptomatology, hospitalization, oxygen requirement, and ventilator use during the acute disease as well as any symptoms after recovery from acute COVID-19 disease. Patients were contacted during their extended postpartum period and systematically asked about a list of post-COVID-19 symptoms (dyspnea, myalgia, fatigue, anosmia, ageusia, chest pain, cough, mood disturbances, etc.), but they were also free to report any other symptoms that they considered relevant. The health-related QoL was evaluated using the EuroQoL five-dimension five-level questionnaire telephone interview version. In-person interview and telephonic interview methods were arranged for collection of data. Descriptive statistical analysis was done. **Results:** Among the 173 consented participants, the mean age was 26.3 (±6.6) years, most of them were primiparous (45.66%), admitted with gestational age between 37 and 40 weeks (68.21%), asymptomatic (85.54%) or mildly symptomatic. For symptomatic cases, the most common clinical presentations included fever, cough, and dyspnea. Only 1.16% of symptomatic subjects required ventilator support. For 58.96% patients, hospital stay was less than a week. Mean duration of stay was 5.86 days. However, 87.28% patients required antiviral medications. About 23.70% have various comorbidities among which anemia 7.51% and preeclampsia 6.35% predominated. About 85.55% did not experienced any persistent symptoms after discharge but some of the subjects shown persistent symptoms such as cough, fever, and breathlessness among which persistent cough predominates (7.51%). In relation to post-COVID effects, 82.56% were found asymptomatic while rest 17.44% showed effects such as body ache, insomnia, cough, and loss of taste and smell and depression. **Conclusion:** COVID-19 pandemic left its sequels both in the form of physical as well as psychological symptoms in extended postpartum period although health-related QoL does not significantly affected by COVID-19 disease during this period.

Key words: COVID-19; Mental health; Pregnancy; Quality of health care; Quality of life

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INTRODUCTION

COVID-19 disease is caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) a viral pandemic which the globe has witnessed on a never-before-seen scale, which has spread quickly round the world started by the end of 2019 at Wuhan, China.[1] While the respiratory system bears the maximal brunt of the disease, the virus may affect

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all major systems in the body. Even after recovery from the disease, widespread respiratory, circulatory, neurological, and musculoskeletal complaints may persist.[2] In humans, SARS-CoV-2 is thought to enter cells through the cell receptor angiotensin-converting enzyme 2 (ACE-2).[3] The ACE-2 receptor is found in the gastrointestinal tract, lungs, liver, kidneys, endothelial cells of the vascular system, and smooth muscle cells of arteries in higher concentrations.[4] As a result, all of those organs and systems with higher ACE-2 receptor expression may be possible SARS-CoV-2 infection targets.[5] Evidence suggests in addition to the common acute respiratory symptoms (such as cough, dyspnea, and fever). COVID-19 patients have been shown to have signs and symptoms of multiorgan dysfunction which can further set hurdles in medical management and have a negative impact on COVID-19 patient's clinical outcomes.[3]

COVID-19 infection features a remarkable effect not just on physical health, but also on psychological state and overall quality of life (QoL).[6]

Health-related QoL measures became an important and sometimes required as a part of health outcomes appraisal. Measurement of health-related QoL on population provides a consequential way to verify the health-care impact when cure is not possible. It implies value supported subjective functioning as compared with personal expectations and is defined by subjective experiences, states, and perceptions.[7]

Different studies have revealed that COVID-19 has impacted QoL for general population.[8,9] The QoL of health-care professionals was also impacted by COVID-19.[10,11] Many studies have reported that various symptoms are experienced during and after COVID-19 infection.[12] Other studies have shown that post-COVID-19 symptoms are minimal for about 1–6 months after diagnosis, except for people with comorbidities.[13,14] Many studies have explored the QOL of recovered COVID-19 cases in the general population, hospitalized patients, and patients with chronic illness.[9,15-17]

Although there is a less research on this topic, we aimed to assess health-related QoL for recovered COVID-19 pregnant females in their extended postpartum period along with insight into prevailing post-COVID symptoms in this population.

Aims and objectives

The aim of the study was to assess health-related QoL for recovered COVID-19 pregnant females in their extended postpartum period along with insight into prevailing post-COVID symptoms in this population.

MATERIALS AND METHODS

This cross-sectional, semi-structured and questionnaire-based study was conducted on females who were pregnant, contacted COVID-19 infection at any point of their antenatal/intrapartum period and admitted in dedicated COVID hospital. A total of 202 females were admitted between March 1, 2021 & June 30, 2021 in dedicated COVID hospital. Extended postpartum period[18] is defined as period up to 1 year from after child birth. This study was conducted during extended postpartum period (between 6 and 7 months) from date of discharge from COVID dedicated hospital.

The questionnaire included details related to demographics, symptomatology, hospitalization, and oxygen and ventilator used during the acute disease as well as any symptoms after recovery from acute COVID-19. Patients were systematically asked about a list of post-COVID-19 symptoms (dyspnea, myalgia, fatigue, anosmia, ageusia, chest pain, cough, mood disturbances, etc.), but they were also be free to report any other symptoms that they considered relevant.

The post-COVID-19 symptoms of the patients were classified as per NICE guidelines.[19] Acute COVID-19 has been defined as patients with symptoms and signs of COVID-19 for up to 4 weeks. Ongoing symptomatic COVID-19 includes patients with symptoms and signs from 4 to 12 weeks. Patients with symptoms and signs that develop during or after an infection consistent with COVID-19, which continued for more than 12 weeks and are not explained by an alternative diagnosis, are said to have post-COVID-19 syndrome. Long COVID[20] is defined as signs and symptoms that persist or develop after acute COVID-19 and included both "ongoing symptomatic COVID-19" and "post-COVID-19 syndrome".

Health-related QoL was evaluated using the EuroQoL five-dimension five-level questionnaire (EQ-5D-5L) telephone interview version. The EQ-5D-5L measures the QoL based on a five-component scale (mobility, self-care, usual activities, pain/discomfort, and anxiety/depression).[21] Each component has five response levels: No problems (Level 1), slight problems (Level 2), moderate problems (Level 3), severe problems (Level 4), and extreme problems (Level 5).

Readable translated Hindi version of EQ-5D-5L was used to assess health-related QoL and was used after testing for reliability (with Cronbach's alpha of 0.9).

Out of 202 admitted females, only 173 were consented verbally to participate in the present study after exclusion of mortality. Both the mode of in-person interview and telephonic interview were arranged for collection of data.

Data were analyzed using Statistical Package for the Social Sciences version 24.0 and Microsoft Excel version 16. Descriptive statistics, such as frequencies, percentage, and mean and standard deviation, were employed for the presentation of categorical and continuous variables, respectively.

Informal verbal consent was taken from participants and study has been approved from the Institutional Ethical Committee.

RESULTS

Among a total of 202 pregnant women who tested positive for SARS-CoV-2, 173 consented to this study, representing 85.64% uptake rate. Among participated women mean age was 26.3 (±6.6) years, most of them were primiparous (45.66%), admitted with gestational age between 37 & 40 weeks (68.21%). The most of the pregnant females were asymptomatic (85.54%). Maximum (58.96%) had with duration of hospital stay less than a week. For symptomatic cases, the most common clinical presentations included fever, cough, and dyspnea. Only 1.16% of symptomatic subjects required ventilator support. For most of the patients (58.96%), hospital stay was less than a week. Mean duration of stay was 5.86 days. However, 87.28% patients required antiviral medications. About 76.30% pregnant females had no comorbidities associated while 23.70% have various comorbidities among which anemia (7.51%) and preeclampsia 6.35% predominated. Full obstetrics and acute COVID-19-related parameters of participants are detailed in Table 1.

Table 2 shows post-COVID effects on physical and mental health of subjects in extended postpartum period. Most of the subjects (85.55%) did not experienced any persistent symptoms after discharge but some of the subjects shown persistent symptoms such as cough, low fever, and breathlessness among which persistent cough predominates (7.51%). In relation to post-COVID effects, 82.56% were found asymptomatic while rest 17.44% showed effects such as bodyache, insomnia, cough, loss of taste and smell, and depression.

While using EQ-5D-5L for assessment of health-related QoL, the majority of participants did not have any problem in all dimensions of EQ-5D-5L. Involved dimensions were of mobility (3.46%), usual activities (5.2%), pain/discomfort (7.52%), and anxiety/depression (8.1%) for level 1. Only anxiety/depression was found to level 2 in 1.73% subjects (Table 3).

Table 1: Obstetrics characteristics and COVID-19-related parameters of the study subjects

Variable	n=173 (%)
Parity	
1	79 (45.66)
2	52 (30.06)
Multi	42 (24.28)
Age group in years	
<20	3 (1.73)
21–30	152 (87.87)
31–40	18 (10.4)
Gestational age in weeks	
<28	9 (5.20)
29–36	35 (20.23)
37–40	118 (68.21)
>41	11 (6.36)
Associated Comorbidities	
Nil	132 (76.30)
Anemia	13 (7.51)
PIH/Preeclampsia	11 (6.35)
Ante partum Eclampsia	6 (3.47)
Hypothyroidism	5 (2.89)
Others (Thrombocytopenia/GEDM/ PPE/Jaundice/HELLP)	6 (3.47)
Duration of stay in hospital in weeks	
<1	102 (58.96)
1–2	69 (39.88)
>2	02 (1.16)
Need of antiviral treatment	
Yes	151 (87.28)
No	22 (12.72)
Need of ventilator	
No	171 (98.84)
Yes	2 (1.16)
Need of Oxygen	
No	6 (3.47)
Yes	167 (96.53)

Table 2: Post-COVID effects on pregnant females

On-going symptoms	n=173 (%)
Asymptomatic	148 (85.55)
Cough	13 (7.51)
Fever	6 (3.47)
Breathlessness	2 (1.16)
Multiple	4 (2.31)
Post-COVID symptoms	**n=173 (%)**
Nil	143 (82.56)
Low mood/Depression/Anxiety	14 (8.09)
Body ache	6 (3.46)
Insomnia	5 (2.89)
Cough	3 (1.73)
Loss of Taste/Smell	2 (1.15)

DISCUSSION

Limited data are available regarding the postpartum effects of COVID-19 on maternal health. The results of this study depicted a risk profile associated with post-COVID effects on maternal health associated with COVID-19 during pregnancy.

The population enrolled was composed of COVID-19-infected pregnant women. They do not seem to display more severe disease symptoms. Most cases were asymptomatic or mildly symptomatic. In detail, we found that 80% of

Table 3: Health-related quality of life using EQ-5D-5L

SN	Dimension n=173 (%)	No problems (Level 1)	Slight problems (Level 2)	Moderate problems (Level 3)	Severe problems (Level 4)	Extreme problems (Level 5)
1	Mobility	167 (96.53)	6 (3.46)	0 (0)	0 (0)	0 (0)
2	Self-Care	173 (100)	0 (0)	0 (0)	0 (0)	0 (0)
3	Usual Activities	164 (94.8)	09 (5.2)	0 (0)	0 (0)	0 (0)
4	Pain/Discomfort	160 (92.48)	13 (7.52)	0 (0)	0 (0)	0 (0)
5	Anxiety/Depression	159 (91.9)	11 (8.1)	3 (1.73)	0 (0)	0 (0)

cases were asymptomatic or showed few symptoms, 15% showed mild–severe symptoms, and only 4% of admissions to intensive care units (ICUs) were for severe symptoms, with similar rates as in the other literature.[22] In our study, the majority of the patients were primipara (45%). Adverse outcomes resulting from maternal infection with SARS-CoV-2 during pregnancy are infrequent. Most cases of COVID-19 among pregnant individuals did not progress to severe disease and ICU admission involving mechanical ventilation was seldom required. Results were similar in two studies of pregnant women admitted hospitals in other studies.[23]

However, our study and recent other studies have shown that and females with associated comorbidities at the time of admission were more likely to experience ICU admission, intubation, and mechanical ventilation.[24,25] It can be explained on the fact that the presence of comorbidities (diabetes, preeclampsia, cardiovascular disease, and hypertension) is associated with reduced production of the protective peptide angiotensin-(1–7) by the membrane-bound ACE2, leading to vasoconstriction, inflammation, fibrosis, edema, and lung damage.[26]

Some females experienced the persistence of COVID-19 symptoms such as persistent cough, fever, and myalgia even after the discharge. This could be due to the relative immunosuppressed state in pregnancy.

Among the post-COVID symptomatic effects, low mood/depression was the most commonly experienced symptom. This might be due to the anxiety associated with the fear of disease which was exaggerated by media coverage with emphasis on high daily death rates and the fear of infecting loved ones. These women have received single isolated rooms with more targeted personal care and minimal interaction with other persons. Thus, there was a lack of a family member to provide support and prolonged recovery. The COVID-19 pandemic delayed utilization of many non/semi "essential" health services to prevent transmission within clinics, which led to significant compromise in the antenatal and postnatal care. Women might also choose to avoid visits due to lack of transportation, familial pressure to isolate, and personal fears of the virus resulting in extra precautions resulting in reduction in antenatal and postnatal care. Such stressors and lack of proper care have been implicated in over thinking about the condition which resulted in the poor psychological and emotional health leading to heightened level of clinically relevant depression. Similar findings of clinically significant depression or anxiety in postpartum period were also reported in other studies.[25]

Limitations of the study

Study could not differentiate other possible causes of post covid symptoms from COVID-19 infection.

CONCLUSION

The management of COVID-19 in a pregnant woman remains an evolving challenge for obstetricians and physicians as it involves physical as well as psychological factors. Pre-existing comorbidity seemed to be risk factors for severity of COVID-19 in pregnancy, including admission to an ICU and invasive ventilation. An increased risk of distress and psychiatric problems during pregnancy and postnatally during the pandemic is likely. Specific strategies targeting maternal isolation or maternal stress, such as psychological support and effective risk communication, can reduce risk to women and their infants.

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VG- Concept and design of the study; **AS-** Concept and coordination prepared first draft of manuscript; **SS-** Concept and design of the study, statistical analysis and interpretation, and preparation of manuscript; and **ASh-** Concept and design of the study, statistical analysis and interpretation, preparation of manuscript, and revision of the manuscript.

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