

Research Article

Pregnancy Outcome in COVID-19 Suspected and COVID-19 Confirmed Women: A Comparative Analysis

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Abstract

Objective: To determine pregnancy outcome in COVID-19 suspected and confirmed women presenting to a tertiary care hospital.

Methods: An analytical study comparing clinical outcome of confirmed COVID-19 with suspected COVID-19 pregnant women was carried out during three-month period from 1st July to 30th September 2020 at COVID-19 ward on pregnant women of Sir Ganga Ram Hospital Lahore. Information including clinical features, obstetrical outcome, ventilatory support and mortality was collected on a predesigned Proforma. The data were analyzed by using SPSS version 24. Qualitative data were expressed as frequency, percentages and chi-square, While quantitative variables as mean \pm SD.

Results: Eighty-three patients were enrolled, including 41 confirmed and 42 suspected COVID-19 cases. The mean age was 28.59 years \pm 4.9. The mean gestational age on admission was 31.98 weeks. Obstetrical complications included miscarriage in 5 (11.6%) cases, preterm labor in 5 (11.6%), PPROM in 1 (2.3%) and IUD in 2 (4.7%) in COVID-19 suspect group. A total of 17/41 confirmed and 19/42 suspected COVID-19 were delivered during the study mostly through caesarean section. Supplemental oxygen, ICU admission, and invasive mechanical ventilation were more common in COVID-19 suspect group compared to confirmed COVID-19 group. There were 12(28.5%) mortalities in COVID-19 suspect group as compared to 2/41 (4.8%) in confirmed COVID-19 group.

Conclusion: In patients having epidemiological exposure, clinical features of COVID and suggestive chest X-ray/CT chest findings even with negative COVID-19 PCR, high index of suspicion of COVID-19 must be mainstay to prevent delayed management and disease spread till the availability of more sensitive test.

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Introduction:

Severe acute respiratory syndrome coronavirus (SARS-CoV-2), a novel RNA coronavirus is identified as the cause of pneumonia epidemic in

Wuhan. Due to its widespread infectivity and millions of deaths caused by it across the globe, It was declared as a pandemic by WHO^{1,2}. It commonly presents with mild disease (fever, cough, sore throat and myalgia) similar to other coronaviruses³. The

individuals with moderate to severe disease suffer from dyspnea, reduced oxygen saturation, features of interstitial pneumonia and subsequent multiorgan involvement resulting in need of ICU and ventilatory support and even mortality^{4,5}. The fetomaternal complications reported in COVID-19 positive pregnant women include miscarriage, premature birth, premature rupture of membranes, fetal demise, preeclampsia, admission to intensive care and death. Vertical transmission of infection has not been reported except in few cases^{6,7,8,9}.

The diagnostic test recommended so far for COVID-19 is RT PCR^{10,11}. Accuracy of viral RNA swabs in clinical practice varies depending on the site and quality of sampling, (93% for broncho-alveolar lavage, 72% for sputum, 63% for nasal swabs, 32% for throat swabs), stage of disease, viral load, sample transportation, sample storage, kit performance and result interpretation of a Lab^{12,13&14}. The lack of gold standard diagnostic test and low sensitivity of RT PCR in the context of extremely variable clinical presentation prove to be greatest challenge for the clinicians. In patients with negative RT PCR the old dictum to base clinical judgment on history and examination combined with other evidence like repeat swab, chest radiographs, and computed tomography scans seems to be the most logical approach. In poor resource settings financial constraints limit the practice of repeating RT PCR leaving many COVID-19 patients undiagnosed or misdiagnosed, resulting in delayed treatment, and leaving a potential source of infection transmission in the hospital ward and later in the community. Researchers have reported patients with high clinical suspicion of COVID-19 and suggestive CT chest findings undiagnosed as COVID-19 due to false negative PCR which implies against using only PCR to exclude COVID-19 in patients with high clinical suspicion^{5,16}. Majority of researchers have reported clinical outcome in confirmed COVID-19, whereas clinical outcome in suspected cases has been overlooked and limited data is available. The objective of this study was to compare the pregnancy outcome in clinically suspected RT-PCR negative woman with RT-PCR positive pregnant woman (confirmed COVID-19).

Methods:

It was an analytical study conducted during three-month period from 1st July to 30th September 2020 at COVID-19 ward on pregnant women of Sir Ganga Ram Hospital Lahore.

Selection and exclusion: Pregnant women presenting with single positive RT-PCR test for COVID-19 infection were taken as COVID-19 confirmed patients. Pregnant women with COVID-19 relevant symptoms (cough, fever, shortness of breath, body aches, anosmia, loss of taste or diarrhea), suggestive epidemiological history (exposure to COVID-19 positive contact or susceptible environment) and typical chest X-ray or CT chest findings (ground glass appearance) with negative COVID-19 RT-PCR were taken as COVID-19 suspects. Women with medical disorders like chronic respiratory disease, hypertension, diabetes mellitus, and heart disease were excluded from the study.

After the approval of the Ethical Committee, FJMU all pregnant women fulfilling inclusion criteria were enrolled in the study. The written informed consent was taken from the spouse or blood relative of patient avoiding patients contact with papers to reduce infection transmission. Patients were divided into two groups, COVID-19 confirmed patients with positive RT PCR as group A and COVID-19 suspects with negative RT-PCR report as group B. Observance of SOPs for handling COVID-19 patients by all the concerned medical staff attending the patients was ensured including use of personal protective equipment (PPE). Ensuring confidentiality and anonymity, symptoms of disease, epidemiology and details of current and past pregnancy were recorded in a proforma. Investigations including CBC (TLC, DLC, platelets), CRP, and chest X-ray / CT chest were done in all women. Rest of investigations were done as per requirement of patient. Patients were followed and observed throughout their hospital stay. The maternal outcomes including duration of hospital stay, obstetrical complications like miscarriage, preterm labor/PROM, intrauterine demise, fetal distress, mode of delivery, need for oxygen, ICU admission, need for mechanical ventilation and mortality were recorded in both groups. The neonatal outcome including 1 minute Apgar score, admission to NICU,

neonatal resuscitation and vertical transmission of COVID were also collected

The data were analyzed by using SPSS (Statistical Package for Social Sciences) version 24. Quantitative variables were expressed as mean \pm SD and median with inter-quartile range. Qualitative were expressed as frequency, percentages and chi-square.

Results:

During the study period 83 patients were enrolled, including 41 confirmed COVID-19 and 42 COVID-

19 suspect cases. The range of age was 19-40 years (mean \pm SD = 28.59 years \pm 4.9). Gestational age on admission in weeks ranged from 10- 42 weeks with mean and median gestational age 31.98 and 36 weeks respectively (Table 1). Out of 83 pregnant women, 20 (24.1%) were primiparous, 63 (75.9%) were multiparous. There was no statistically significant difference in epidemiology in terms of environmental exposure (24.3% vs. 26.1%) or contact with infected person (46.3% vs. 45.2%) in both groups (Table 1).

Table I: Demographics and Baseline Characteristics of confirmed and suspected COVID-19 Pregnant Women

Clinical Characteristics	All Patients (n = 83)	COVID-19 Confirmed (n =)	COVID-19 Suspected (n = 42)	P value	Confidence interval
Age (years)					2.29 - 2.53
Mean \pm SD	28.5 \pm 4.9	27.9 \pm 4.5	29.2 \pm 5.2		
Range	19 - 40	19 - 39	19 - 40		
Gestational Age on Admission, wk					2.54 - 2.81
<13+6, n(%)	7 (8.4)	2 (4.8)	5 (11.9)		
14-27+6, n(%)	13 (15.6)	8 (19.5)	5 (11.9)		
28-42, n(%)	63 (75.9)	31 (75.6)	32 (76.1)		
Parity					1.47 - 1.83
Nulliparous, n(%)	20 (24.09)	7 (17.0)	13 (30.9)		
Multiparous, n(%)	63 (75.91)	34 (83.0)	29 (69.1)		
Epidemiological History					
Environmental Exposure, n(%)	21 (25.3)	10 (24.3)	11 (26.10)	.85	1.65 - 1.84
Contact exposure n(%)	38 (45.7)	19 (46.3)	19 (45.2)	.92	1.43 - 1.65
Symptoms					
Fever, n(%)	54 (65.0)	19 (46.3)	35 (83.3)	.000	1.24 - 1.45
Cough, n(%)	44 (53.0)	13 (31.7)	31 (73.8)	.000	1.36 - 1.58
SOB, n(%)	42 (50.6)	12 (29.2)	30 (71.4)	.000	1.38 - 1.6
Diarrhea, n(%)	2 (2.4)	0 (0.0)	2 (4.7)	.157	1.94 - 2.01
Loss of Smell, n(%)	1 (1.2)	1 (2.4)	0 (0.0)	.309	1.96 - 2.01
Body aches, n(%)	3 (3.6)	3 (7.3)	0 (0.0)	.07	1.92 - 2.00

The most common symptom at presentation in COVID-19 confirmed versus COVID-19 suspect was fever (46.3% vs. 83.3%), cough (31.7% vs. 73.8%), Shortness of breath (29.2% vs. 71.4%) with

more frequency of symptoms seen in COVID-19 suspect group (P value .000). Whereas diarrhea was present only in 2 (4.7%) women in COVID-19 suspect group and 1(2.4%) patient in COVID-19 con-

firm group had loss of smell. Pregnancy complications were mainly noted in COVID-19 suspect group, miscarriage at gestation < 14 weeks in 5 (11.6%) cases, preterm labor in 5 (11.6%), PPRM in 1 (2.3%) and IUD in 2 (4.7%). None of these

complications were observed in COVID-19 confirm group. Fetal distress was seen in 5 (12.1%) in confirmed and 1 (2.3%) in suspected group.

Table 2: *Clinical Outcome of confirmed and suspected COVID-19 Pregnant Women*

Clinical Characteristics	All Patients (n=83)	COVID-19 Confirmed (n=41)	COVID-19 Suspected (n=42)	P value	Confidence interval
Pregnancy Complications					
Miscarriage, n(%)	5 (6.02)	0 (0.0)	5 (11.6)	.023	1.89-1.98
Preterm Labor, n(%)	5 (6.02)	0 (0.0)	5 (11.6)	.023	1.89-1.99
PPROM, n(%)	1 (1.2)	0 (0.0)	1 (2.3)	.320	1.96-2.01
IUD, n(%)	2 (2.4)	0 (0.0)	2 (4.7)	.157	1.94-2.01
Fetal Distress, n(%)	6 (7.2)	5 (12.1)	1 (2.3)	.084	1.87-1.98
Clinical Characteristics					
Oxygen, n(%)	27 (32.5)	2 (4.8)	25 (59.5)	.000	1.57-1.78
ICU Admission, n(%)	19 (22.8)	2 (4.8)	17 (40.4)	.000	1.68-1.86
Ventilatory Support, n(%)	16 (19.2)	2 (4.8)	14 (33.3)	.001	1.72-1.89
Recovered, n(%)	69 (83.1)	39 (95.1)	30 (71.4)		1.10-1.27
Mortality, n(%)	14 (16.8)	2 (4.8)	12 (28.5)	.004	1.75-1.91
Pregnancy Outcomes					
EM LSCS, n(%)	18/36 (50%)	9/17 (52.9%)	9/19 (47.3%)	.945	1.69-1.87
EL LSCS, n(%)	8/36 (22.2%)	7/17 (41.1%)	1/19 (11.1%)	.023	1.84-1.97
SVD, n(%)	10/36 (27.7%)	1/17 (5.8%)	9/19 (47.3%)	.008	1.81-1.95
ABGAR Good, n(%)	32 (38.5)	17 (41.4)	15(35.5)	.247	1.91-2.36
ABGAR Bad, n(%)	4 (4.8)	0 (0.0)	4(9.5)		
Baby COVID-19 Positive Status, n(%)	0 (0.0)	0 (0.0)			
Laboratory & Radiological Findings					
Hb, low, n(%)	29 (34.9)	7 (17.0)	22(52.3)	.001	1.24-1.45
TLC, high, n(%)	27 (32.5)	9 (21.0)	18(42.8)	.042	1.22-1.45
CRP, high, n(%)	37 (44.5)	14 (34.1)	23(54.7)	.059	1.34-1.55
Chest CXR, Abnormality n(%)	49 (59.0)	7 (17.0)	42(100)	.000	1.48-1.7

A total of 36/83 women delivered during hospitalization, 17/41 confirmed COVID-19 patients in comparison to 19/42 COVID-19 suspects. Equal number of women had emergency cesarean section in both groups, while more had elective cesarean section in confirmed COVID-19 group (7 vs 1). Nine women had spontaneous vaginal deliveries in COVID-

COVID-19 suspect group compared to one in confirmed COVID-19 group (Table 2). Amongst 36 neonates born, 2 were IUD and 2 were admitted in NICU in COVID-19 suspect group.

There were 27/83 (32.5%) patients who needed supplemental oxygen, 19/83 (22.8%) patients with

severe pneumonia all required ICU admission, 16/83 (19.2%) received invasive mechanical ventilation. All these complications were more common in COVID-19 suspect group compared to confirmed COVID-19 group (P value .000, .000, .001 respectively) (table 1). A total of 69 (83.2%, 69/83) cases had been discharged till the end of study. There were 12(28.5) mortalities in COVID-19 suspect group as compared to 2/41 (4.8) in confirmed COVID-19 group (P value .004). Chest x-ray abnormalities were observed in 49(59%) cases (P value .000), 7(17%) in COVID-19 confirmed and 42(100%) in COVID-19 suspect group. It has been observed that TLC was raised in 9 (21.0%) in COVID-19 confirmed and 18(42.8%) suspect (P value .042). CRP was raised 14(34.1) and 23(54.7) in confirmed and suspected group respectively (P value .059) (Table 2).

Discussion:

So far limited data is available on COVID-19 in pregnancy. The available literature reports clinical outcome of confirmed COVID-19 during pregnancy but very few studies are available on the clinical outcome of pregnant women with high clinical suspicion and negative PCR (suspected COVID-19). We have done this analytical comparative study to compare and report the clinical outcome of COVID-19 confirmed and suspected pregnant women.

A total of 83 pregnant women were included in the study with 41 confirmed and 42 Suspected COVID-19 pregnant women. The mean age in our study was 28 ± 4.9 years. Majority of women were multiparous in the confirmed COVID-19 group compared to suspected group. In both groups majority of women were in 3rd trimester. We found no difference in terms of environmental and contact exposure between both groups. In accordance with our study, researchers reported mean age of 30.8 ± 3.8 and majority of women in 3rd trimester in both groups^{9,17}. But Yan et al had predominance of nulliparous women in both groups. He also reported more contact exposure in confirmed COVID-19 pregnant women¹⁷.

In present study fever, cough and shortness of breath (SOB) were the most common symptoms in both groups. The proportion of patients having fever and cough was more in suspected COVID-19 compared

to confirmed COVID-19 in our study. A plausible explanation could be the inclusion of many asymptomatic COVID-19 positive pregnant women isolated in COVID ward due to government policy of patient isolation in hospital in the beginning of pandemic. Concordant with our results Yang et al also found more fever in the suspected group¹⁷. Other researchers also reported fever and cough as most common symptoms in both the groups, with preponderance of fever in the confirmed COVID-19 group^{7,8,9,17,18}.

Regarding pregnancy complications miscarriage, preterm labor and fetal distress were the most common obstetric complications observed in our patients. Miscarriage and preterm labor were more common only seen in suspected COVID-19 group while fetal distress was more common in the confirmed COVID-19 group. Other researchers have also reported these obstetric complications^{5,6,7,9}. There was statistically significant difference between the two group in terms of oxygen requirement (4.8% vs. 59.5%), ICU admission (4.8% vs. 40.4%) and need of ventilatory support (4.8% vs. 33.3%), all being more prevalent in the suspected COVID-19 group. Mortality was observed in 4.8% patients in confirmed COVID-19 group as compare to 28.5% in the suspected COVID-19 group. The possible explanation of more obstetric as well as non-obstetric complications in suspected COVID-19 group is that suspected COVID-19 group had all symptomatic women presented due to disease severity, while the confirmed COVID-19 group included both symptomatic and asymptomatic COVID-19 positive women. Secondly the higher need of oxygen, ICU admission, ventilatory support and mortality point towards the possibility of undiagnosed COVID-19 cases due to false negative PCR in the suspected COVID-19 group. As by policy PCR was carried out only once on nasopharyngeal swab to diagnose COVID-19. Due to limited resources it was not repeated multiple times or on other samples like bronchial lavage etc., as was the practice in developed countries, which a limitation of this study. Yan et al reported opposite results with more ICU admission (6 vs. 2), non-invasive (6 vs. 0) and invasive mechanical ventilation (2 vs 0) in confirmed COVID

group. There was no mortality in either group in his study¹⁷.

In accordance with the literature, in our study cesarean section was the preferred mode of delivery in both the groups. There were more (47.3%) vaginal deliveries in the COVID-19 suspected group compared to 5.8% in confirmed COVID-19 group women^{9,16}. No baby in the confirmed COVID-19 group was COVID-19 PCR positive which is in accordance with local and international studies^{6,7,8,16}. Neonatal PCR was not done for the suspected group because by hospital policy PCR was only done for neonates of COVID-19 PCR positive women.

The raised CPR was found in 34% of confirmed COVID-19 women compared to 54% of suspected COVID-19 women. More patients had raised CRP in the suspected group as all patients were severely ill and raised CRP is not diagnostic of COVID-19 as it may be raised in other infectious or inflammatory conditions as well. Different from our results Yan found raised CRP more in confirmed COVID-19 group. We found findings suggestive of COVID-19 on X-ray chest in 100% of suspected COVID-19 group while 17% of confirmed COVID-19 group. Yan reported ground glass opacity on CT chest in 100% of clinically diagnosed cases while 93% of COVID-19 confirmed cases¹⁷. As our study had many asymptomatic cases so many of them had normal X-ray chest and CRP. Abnormal X-ray in the suspected group indicates the possibility of misdiagnosed or undiagnosed COVID-19 cases due to false negative PCR.

Conclusion

The clinical outcome of suspected COVID-19 women was worse than confirmed COVID-19, which signifies possibility of false negative RT-PCR due to its low sensitivity. A high index of suspicion of COVID-19 in patients having epidemiological exposure, clinical features of COVID and suggestive chest X-ray/CT chest findings even with negative RT PCR is the mainstay to prevent delayed management and disease spread till the availability of more sensitive test.

Limitation:

PCR could not be repeated multiple times to confirm COVID due to financial constraints of a public hospital.

Strength:

We reported clinical outcome of suspected COVID-19 pregnant women with negative PCR, which was being overlooked in literature focusing more on COVID-19 PCR positive pregnant women only.

Ethical Approval: Given

Conflict of Interest: The authors declare no conflict of interest

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