Pregnancy outcomes among symptomatic and asymptomatic women infected with COVID-19 in the west of Iran: a case-control study

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SHORT REPORT

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Pregnancy outcomes among symptomatic and asymptomatic women infected with COVID-19 in the west of Iran: a case-control study

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ABSTRACT

Background: The purpose of this study was to investigate pregnancy outcomes among symptomatic and asymptomatic women infected with coronavirus disease 2019 (COVID-19) in the west of Iran.

Materials and methods: In this case-control study, 45 pregnant women infected with symptomatic COVID-19 were compared with 45 pregnant women infected with asymptomatic COVID-19. The cases included women were referred for delivery to hospitals of Hamadan Province and infected with COVID-19-related symptoms. The diagnosis of COVID-19 was based on the results of real-time reverse-transcriptase polymerase-chain-reaction (rRT-PCR) detection. The control group included asymptomatic women who were referred for delivery to hospitals in Hamadan Province infected with COVID-19. Data were collected by a checklist. For the data analysis, the Stata version 12 was used (StataCorp, College Station, TX).

Results: The odds of cesarean delivery in symptomatic women was more the fourfold higher (OR = 4.12, 95% CI (1.7, 10.05), $p = .002$). Moreover, the odds of LBW was significantly higher in symptomatic women (OR = 2.1, 95% CI (1.2, 6.29), $p = .035$).

Conclusions: Our findings showed that cesarean delivery and LBW were significantly higher in symptomatic women compared with asymptomatic women. In areas with high COVID-19 pandemics, the performance of the PCR test is recommended for all pregnant women upon admission for delivery.

Introduction

An outbreak of coronavirus disease 2019 (COVID-19) infection was first emerged in late 2019 in Wuhan, China and being exported to a growing number of countries [1]. Although, our knowledge of this disease, regarding the pregnancy-specific information remains limited [2–4]; however, previously observed greater risk of severe morbidity and mortality in pregnant women through other respiratory infections such as SARS, MERS, and influenza raised concerns that the risk of morbidity and mortality in pregnant women be higher than the general population [5–8].

Evidence shows that a significant percentage of pregnant women with COVID-19 are asymptomatic [9]. Whether patients with symptomatic COVID-19 have a higher rate of disease progression to severe disease than asymptomatic cases is currently questionable. Understanding this matter can help clinicians to enable a more appropriate process of triage.

Studies have been performed so far without considering the clinical symptoms in pregnant women with COVID-19. To date, no study has been conducted in Iran regarding the pregnancy outcomes in symptomatic and asymptomatic pregnant women with COVID-19. Hence, we investigated the pregnancy outcomes among symptomatic and asymptomatic pregnant women infected with COVID-19 in the west of Iran.

Materials and methods

This case-control study was performed among women referred for delivery to hospitals of Hamadan Province

Table 1. Baseline characteristics in both symptomatic and asymptomatic women.

Characteristics	Symptomatic women (N = 45)	Asymptomatic women (N = 45)	p Value
Travel history, n (%)	11 (24.44)	3 (6.67)	**.02**
Comorbidity disease, n (%)	3 (6.67)	19 (42.22)	**<.001**
Mother age (years), mean (SD)	29.47 (5.64)	28.78 (6.92)	.61
Gestational age (weeks), mean (SD)	37.13 (2.87)	37.62 (2.56)	.40
Number of live children, mean (SD)	1.73 (0.81)	1.78 (1.06)	.82
Parity, mean (SD)	1.73 (0.81)	1.76 (1.03)	.91
Gravity, mean (SD)	2.02 (1.03)	2.07 (1.27)	.86

The bold values significant level was <0.05.

Table 2. Comparison of pregnancy conditions and delivery outcomes in two groups.

Variable	Symptomatic women (N = 45)	Asymptomatic women (N = 45)	OR (95% CI)[a]	p Value
Preterm labor, n (%)	12 (26.67)	6 (13.33)	2.36 (0.8, 6.99)	.12
Preeclampsia, n (%)	11 (24.44)	4 (8.89)	3.32 (0.97, 11.36)	.056
Cesarean delivery, n (%)	27 (60.00)	12 (26.67)	4.12 (1.7, 10.05)	**.002**
Hospitalization, n (%)	0	2 (4.44)	–	–
Low birth weight (LBW), n (%)	12 (26.67)	4 (8.89)	2.1 (1.2, 6.29)	**.035**
Death rate in neonate, n (%)	2 (4.44)	1 (2.22)	2.04 (0.18, 23.4)	.58

[a]Asymptomatic women were considered as the reference group.
The bold values significant level was <0.05.

located in West of Iran, from 1 September 2020 to 15 November 2020. The protocol of this study was confirmed by the Hamadan University of Medical Sciences with the code: IR.UMSHA.REC.1399.468.

The cases were women who referred for delivery to hospitals of Hamadan Province and infected with COVID-19-related symptoms. The diagnosis of COVID-19 was based on the results of real-time reverse-transcriptase polymerase-chain-reaction (rRT-PCR) detection. The samples were collected from upper respiratory nasopharyngeal swabs to confirm COVID-19.

Confirmation of SARS-COV2 based on PCR test, single pregnancy and having at least three of the symptoms infected with COVID-19 (fever ≥37.8, dry cough, dyspnea, myalgia or fatigue, headache, nausea and vomiting, diarrhea, and loss of smell and taste) were the inclusion criteria in the case group. The control group was included asymptomatic women who referred for delivery to hospitals in Hamadan Province infected with COVID-19 by PCR test.

Informed consent was obtained from pregnant women. For the newborn infant, verbal informed consent was taken from his/her parents. In the present study, cases and controls were 45 women per group. Data were collected by a checklist. The validity and reliability of the checklist were assessed. Chi-square, t-test, and logistic regression were used for comparison of background characteristics between the two groups. For the data analysis, the Stata version 12 (StataCorp, College Station, TX) was used with p value of ≤.05 as statistical significant.

Results

In this case-control study, the number of 45 pregnant women infected with symptomatic COVID-19 was compared with 45 pregnant women infected with asymptomatic COVID-19.

The baseline characteristics of patients in the case and control group are compared in Table 1. As shown, the symptomatic women had the higher rate of travel to contaminated areas (24.44% vs. 6.67%, p = .02). The rate of comorbidity disease was significantly higher in asymptomatic women (42.22% vs. 6.67%, p<.001). While, the two groups were homogenous in regard of mother age, gestational age, number of live children, parity, and gravity (p > .05).

In Table 2, we compare pregnancy conditions and delivery outcomes in two groups. The odds of cesarean delivery in symptomatic women was more than fourfold higher (OR = 4.12, 95% CI (1.7, 10.05), p = .002). Moreover, the odds of LBW was significantly higher in symptomatic women (OR = 2.1, 95% CI (1.2, 6.29), p = .035). Although the rate of preeclampsia (24.44% vs. 8.89%), preterm labor (26.67% vs. 13.33%), and neonate death (4.44% vs. 2.22%) was higher in symptomatic women, but these differences were not statistically significant (p>.05).

Discussion

Our study showed that the odds of cesarean delivery in symptomatic women was more than the fourfold higher. Moreover, the odds of LBW was significantly higher in symptomatic women.

London et al. in USA showed that pregnant women infected with COVID19-related symptoms and a positive PCR test have a higher rate of preterm labor than asymptomatic pregnant women [10]. In the present study, preterm labor was higher in symptomatic

women, although this difference was not statistically significant. Therefore, it is important to be particularly rigorous in caring for COVID-19 infected pregnant women infected with COVID-19-related symptoms.

London et al. reported that the cesarean birth rates of symptomatic and asymptomatic women were not significantly different, although the cesarean rate in symptomatic women (45.8%) was higher in symptomatic women (27.3%) [10]. However, in our study, the odds of cesarean delivery in symptomatic women was more than fourfold higher. Tanacan et al. showed that there was a significant association between birth weight in high-risk pregnancy group and low-risk pregnant women without any defined risk factor among women infected with COVID-19 [11]. Our study reported that the odds of LBW was significantly higher in symptomatic women.

Our findings showed that mother-to-fetal transmission did not happen. It is consistent with other studies [12,13]. Breslin et al. in the USA reported that there were no confirmed cases of COVID-19 detected in neonates based on tests on the first day of life [9]. Our study results confirmed this study.

There were several limitations in our study. (a) We did not follow mothers and neonates in postpartum to assess symptoms infected COVID-19. (b) Laboratory findings such as HB, HCT, bilirubin, and urea were not determined. (c) This study was performed in a low sample size and thus we were not able to control for all potential confounders. Therefore, we proposed that this study was conducted in a large sample size.

Our findings showed that cesarean delivery and LBW were significantly higher in symptomatic women compared with asymptomatic women. In areas with high COVID-19 pandemics, the performance of PCR test is recommended for all pregnant women upon admission for delivery.

Acknowledgements

Disclosure statement

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