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ORIGINAL ARTICLE

Covid-19, Clinical Manifestations in Pregnant Women, Aftermaths on Timing and Mode of Delivery at Hail, Saudi Arabia

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ABSTRACT

Objectives: The study was performed to identify the clinical manifestation of Covid-19 infection during pregnancy its impact on the pregnancy outcomes, and its presentation in completely/incompletely vaccinated women.

Material and Methods: We conducted this cross-sectional study at Ha`il, a northern city in Saudi Arabia, starting from 15th Dec. 2021 till 15th Jan. 2022. The mean differences of background variables were computed by using the Independent-Sample t-test. A Chi-square test was applied to assess the presentation of the disease in pregnant/non–pregnant and vaccinated/ non-vaccinated women. P-value <0.05 was taken as statistically significant.

Results: Fatigue followed by fever and cough (65, 42, and 38% respectively) were the most common presentations of infection during pregnancy. Hospitalization (15.4%) and ICU (9.4%) admissions were more in pregnant than in non-pregnant women. Clinical manifestations were the same in the completely and incompletely vaccinated women. The incompletely vaccinated women were at increased risk of hospitalization (p-value 0.01), and pneumonia (p-value 0.05). The covid-19 infection has no significant association with age of the participants, body mass index, and parity. Covid-positive women during pregnancy underwent fewer cesarean- sections than Covid negative (20% vs. 80%, p <0.05). The mean gestational age at delivery, preterm birth, and neonatal weight at birth were the same in both groups. The rate of transmission of the infection to the neonates remained extremely low.

Conclusion: Covid disease during pregnancy doesn't increase the risk of preterm birth, cesarean delivery, or low birth weight of the babies. Complete vaccination against tcovid-19 declines the risk of hospital admission for severe disease and pneumonia in women.

INTRODUCTION

Coronavirus belongs to a large family of viruses presenting from mild symptoms like cold to more severe diseases. The Coronavirus that causes severe acute respiratory syndrome (SARS) was first reported to be transmitted from cats in China in 2002, and the Coronavirus that causes Middle-East respiratory syndrome (Mers) was transmitted to humans from camels in Saudi Arabia in 2012. The current pandemic of Coronavirus (COVID-19) is thought to be linked to a marine and animal market in Wuhan, China.

Coronavirus disease, a highly communicable infectious disease is caused by the SARS-CoV-2 virus. Since the emergence of the virus, the disease has shown several pulmonary, as well as systemic manifestations. Presentation of the disease varies from mild symptoms like fever fatigue cough and shortness of breath to severe infection in the form of severe pneumonia, acute respiratory distress syndrome, disseminated intravascular coagulation, and can lead to death. However, its presentation and effects in vulnerable groups including pregnant women have been poorly documented (1).

Although the previous studies mentioned that women during pregnancy are at less risk of catching the virus (2), the rapid spread of the virus has led to many significant health concerns, especially in pregnant women. Other studies provide evidence on presentation, effects during pregnancy, and treatments that might prove to be effective during pregnancy (3, 4). A study conducted in Saudi Arabia on confirmed cases of covid-19 during pregnancy revealed that the disease takes only a mild course during the pregnancy (3). Similarly, a meta-analysis performed on confirmed or suspected Covid-19 cases also documented that women during pregnancy are less likely to exhibit the severe course of the disease. However, the increasing age, abnormal BMI, pre-existing or current co-morbidities like hypertension, and uncontrolled diabetes are at greater risk (5). The risk of pre-eclampsia, preterm labor emergency cesarean section, operative delivery, thromboembolic complications, and need for ICU admissions are also increased in pregnant women infected with COVID-19 (6). A systemic review published in 2020 also studied the neonatal effects and found out that the most adverse pregnancy outcomes were intrauterine fetal asphyxia and premature rupture of membranes. The neonatal manifestations of the disease included respiratory problems, gastrointestinal symptoms, and sepsis (7). Fewer or nil cases of vertical transmission have been reported (8,9).

A lot of work has been done on the acquisition and transmission of Covid-19 infection. Throughout the pandemic, data has emerged regarding the symptoms and severity of the coronavirus disease. But the studies on a vulnerable population still need a lot of research to establish some guidelines for uniformity of the care. This study aims to educate women who are planning a pregnancy or are already pregnant about the risks of COVID-19. The study will highlight the common manifestations in pregnant women who are completely vaccinated against the virus and unvaccinated or incompletely vaccinated. Additionally, it will provide evidence of complications in terms of preterm birth and cesarean delivery occurring in pregnant women during pregnancy and childbirth.

MATERIAL AND METHODS

We conducted this cross-sectional study at Ha`il, a northern city of the Kingdom of Saudi Arabia (KSA), starting from 15th Dec. 2021 till 15th Jan. 2022. We included Saudi pregnant women living in Hail, previously healthy, having singleton conception, and those females who conceived naturally without any medication and delivered during the pandemic. While, women having any other medical disorder or chronic ailments, using some medications/drugs on a regular basis, conceived twins, or by IVF were excluded from the data.

The sample size comprised 250 reproductive-aged women who were infected with covid-19 with or without pregnancy. To see the effect of Covid disease on pregnancy outcome we compared Covid positive (n=64) women during pregnancy with Covid negative pregnant women(n=65).

The information on age, parity, BMI (Body Mass Index), gestational age at delivery, preterm labor or cesarean birth, and neonatal weight was recorded. The presentation of the disease in

completely or partially vaccinated women was asked and recorded in the self-administered performa questionnaire.

Statistical Analysis: We used SPSS version 23; SPSS Inc., (IBM Corp., Armonk, NY, USA) to analyze the data. Descriptive analysis was done to report the mean score, frequency, and percentage values for study variables. To compare the participants for background variables, the mean differences were computed by using the Independent-Sample t-test. A Chi-square test was applied to assess the presence of the disease in pregnant/non–pregnant and vaccinated/ non-vaccinated women. P-value <0.05 was taken as statistically significant.

Ethics approval: The study protocols were reviewed electronically and approved by the Research Ethics Committee (REC) at the University of Ha'il, KSA on 13th December 2021 by research number (H-2021-234). We conducted this study according to the guidelines of the Declaration of Helsinki. Data was collected after getting informed consent from all the participants after explaining the purpose of the study and ensuring that neither any content of their personal identification nor any source which can reach their identity is required for this work.

RESULTS

The study sample (n=250) included reproductive-age women from 16 to 46 years old. The mean age of participants was 32.6±8 years. They had 0-10 children before and the mean parity was 3.3±2 pregnancies, while the mean BMI was 28.5 ±6.1(15-48.3). During pregnancy, the Covid positive comprised 64 women while 65 were covid negative pregnant women.

The history of contact of the women with the disease positive individuals was significantly associated with the acquisition of infection (p value= 0.007)

Table 1: Comparison based on clinical characteristics of women with early and late-onset GDM(n=161)

Variables	Covid +pregnancy n(%)/ Mean± S.D.	Covid pregnancy Mean± S.D/ n(%)	P value*
Age of the participants(years)	33.6± 6.0	35.03± 5.2	0.019
Parity	3.46±1.9	3.15±2.2	0.137
Obesity(obese/non-obese)	27(41.5%)	38(58.5%)	0.047
Normal BMI	20(74.1%)	7(25.9%)	0.020
Overweight BMI	17(44.7%)	21(55.3%)	
Obese BMI	11(34.4%)	21(65.6%)	
Extreme obesity	16(50%)	16(50%)	
Gestational age at delivery	37.3± 2.1	37.9±1.6	0.118
Cesarean section	3(20%)	12(80%)	0.014
Preterm birth	15(51.7%)	14(48.3%)	0.462
Neonatal birth weight	3.03±0.7	3.06±0.6	0.82

* P-value calculated by one way INOVA for categorical variable
* P-value calculated by t-test for Equality of Means for continuous variables

Table 2: Bivariate analysis showing Clinical presentation and complications with relation to the vaccination status (completely / incompletely received) n=141

	Completely vaccinated (n=124) n(%)	Incompletely vaccinated (n=19) n(%)	P value
Presentations			
Fatigue	69(57%)	13(68.4%)	0.34
Fever	60(49%)	11(58 %)	0.48
Cough	47(38.5%)	11 (58%)	0.11
Shortness of breath	31(26.4%)	6(31.6%)	0.57[1]
Complications			
Hospitalization	10(8.1%)	05(26%)	0.01[1]
Pneumonia	9 (7.3%)	04(21%)	0.05[1]
ICU admission	07(5.6%)	3(15.8%)	0.10[1]

[1]1 cell 25 % have expected count less than 5

The comparison between two groups for the mean age, parity, and body mass index. The outcome measured for gestational age at delivery, need for surgical delivery, preterm birth rates, and mean birth weight of the neonates. (Table 1). The rate of transmission of the infection to the neonates remained extremely low. Only one neonate tested positive at birth.

The association of vaccination status (complete /incomplete) with the clinical presentation was not statistically significant as shown in table 2(p-value ≥0.05). while analyzing the complications of the disease with respect to vaccination status, the rate of hospital admission was significantly less in completely vaccinated as compared to non-vaccinated or incompletely vaccinated women. However, diagnosis of pneumonia diagnosis and ICU admission rates were the same between the two groups.

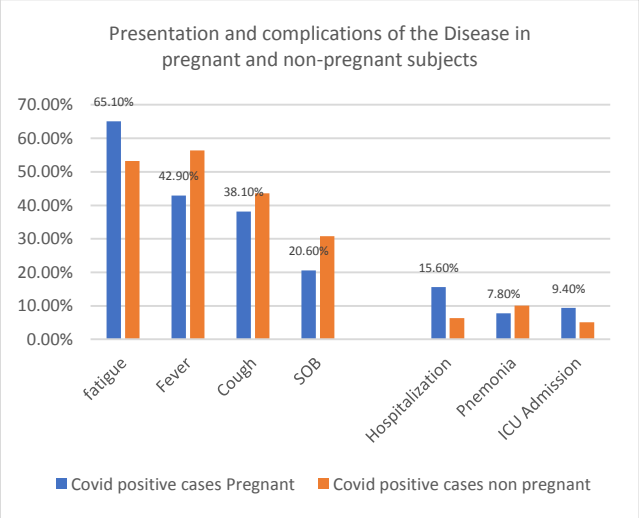

Figure 1: Presentation and complications of the disease in pregnant and non-pregnant subjects

DISCUSSION

Out of our study participants, the younger aged, non-obese (normal BMI) women acquired infection during pregnancy significantly more. Although a systematic review and meta-analysis done by Sofonyas Abebaw Tiruneh et al mentioned that higher age group women are at greater risk of getting the infection (10). Similarly, obesity has been described before as a risk factor (11). This difference can be explained by the fact that in our study young and active women participated more frequently. Being younger or non-obese does not provide any prevention and these women should continue to observe the safety measure.

Covid infection during pregnancy didn't found to be a risk to the ongoing pregnancy. The preterm birth difference wasn't statistically significant and both women with or without covid are at similar risk of preterm births. Similarly, the mean gestational age was also the same in-between the two groups. Similar findings were seen from the study conducted by Aydin GA et al (12)

Some of the studies published before in the previous few years indicated an increased risk of cesarean delivery in Covid-positive women (13, 14) but our findings don't match their results. Our study participants who acquired Covid infection during pregnancy delivered significantly more by vaginal deliveries. Contrary to the past studies (14,15) this study highlighted that having a Covid infection during pregnancy doesn't put the baby at risk of low birth weight.

The results on the effects of Covid disease on pregnancy are quite reassuring as it is evident that the Covid infection during pregnancy does not affect the pregnancy duration and there is no increased risk of preterm delivery, cesarean delivery, or low birth weight babies. However, more studies with large data sets are necessary to reach a better conclusion.

The analysis of the completely vaccinated and incompletely vaccinated women during pregnancy showed that both groups present with almost the same as the difference were not

statistically significant. However, complete vaccination plays a protective role only against the need for hospitalization and pneumonia. The findings are inconsistent with the study conducted by Hall VJ et al (16). Completely vaccinated women had a significantly less hospitalization rate and were at reduced risk of being diagnosed with pneumonia. A study published in Turkey (17) also reported less hospitalization in adequately vaccinated individuals and another study documented less severity of pneumonia in completely vaccinated (18).

A comparison of disease presentation in pregnant vs. non-pregnant showed that the most commonly experienced symptom of the infection in pregnant women was fatigue followed by fever and cough. Fatigue is also a common problem during pregnancy. A systemic review of more than twelve thousand articles evidenced that fever is the most common complaint during pregnancy however disease runs a mild course in pregnant as compared to non-pregnant (19).

The complications of hospitalization and ICU admissions were more in pregnant women who tested positive for Covid-19 as compared to non-pregnant. However, pneumonia rates were the same in the two groups. Pregnancy doesn't increase the risk of pneumonia, the results which were previously published by Vizheh M et al (20).

CONCLUSION

Our study findings suggest that being young and active at a normal weight is not protective against Covid infection during pregnancy. Covid disease during pregnancy doesn't increase the risk of preterm birth, cesarean delivery, or low birth weight of the babies. Complete vaccination against tcovid-19 declines the risk of hospital admission for severe disease and pneumonia in women.

Conflict of interest: The authors declare no conflict of interest.

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