

# The Relationship Between Age and COVID-19 in Pregnancy

Farzaneh Rashidi Fakari<sup>1\*</sup> , Zahra Kiani<sup>2</sup>

1. Department of Midwifery, School of Medicine, North Khorasan University of Medical Sciences, Bojnurd, Iran
2. Sexual and Reproductive Health Research Center, Mazandaran University of Medical Sciences, Sari, Iran



## Article Info

 [10.30699/jogcr.6.3.143](https://doi.org/10.30699/jogcr.6.3.143)

**Received:** 2020/12/01;

**Accepted:** 2021/02/03;

**Published Online:** 26 Jun. 2021

Use your device to scan and read the article online



## Corresponding Information:

Farzaneh Rashidi Fakari,

Department of Midwifery, School of Medicine, North Khorasan University of Medical Sciences, Bojnurd, Iran

Email: [Rashidiff@yahoo.com](mailto:Rashidiff@yahoo.com)



Copyright © 2021, This is an original open-access article distributed under the terms of the Creative Commons Attribution-noncommercial 4.0 International License which permits copy and redistribution of the material just in noncommercial usages with proper citation.

## ABSTRACT

COVID-19 is a novel viral pandemic. It is believed that due to physiological changes within the pregnancy, pregnant women may be more susceptible to COVID-19. Currently, there exists no reliable evidence being available regarding the likelihood of infection for pregnant women compared to the general population. On the other hand, given the previous experiences with SARS and MERS, pregnant women are likely to be at high risk for COVID-19 and its complications. Comparing the results of studies on COVID-19 during pregnancy and that of the general population, it can be concluded that pregnant women develop COVID-19 at a younger age than the general population. The results showed that due to changes during pregnancy, pregnant women have a higher risk for COVID-19 than other people, perhaps due to the lower mean age of COVID-19 in pregnant women, this leads to less COVID-19 on the adverse pregnancy outcomes.

**Keywords:** Age, Birth, COVID-19, High Risk, Pregnancy

## Introduction

COVID-19 is a rapidly expanding acute respiratory disease that emerged in late 2019 in Wuhan, China (1).

Clinical features of COVID-19 may be either asymptomatic or associated with some clinical features such as fever, fatigue, headache, dry cough, sore throat, anorexia, myalgia, rhinorrhea, gastrointestinal symptoms (nausea, diarrhea) Dyspnea, and sputum (2-7).

Currently, there exists no reliable evidence being available regarding the likelihood of infection for pregnant women compared to the general population (8). It is believed that due to physiological changes within the pregnancy, pregnant women may be more susceptible to COVID-19 (9). On the other hand, given the previous experiences with SARS and MERS, pregnant women are likely to be at high risk for COVID-19 and its complications (8). Possible complications of COVID-19 in pregnancy and its consequences are mortality, preterm labor, and preterm rupture of membranes, fetal distress, and respiratory distress (10, 11).

### Age of Diagnosis in the General Population

People of all ages have been reported to be susceptible to COVID-19; however, the highest suffering ages have been reported to be adulthood and the elderly (over 40). In a case report on 138 patients with coronavirus in Wuhan, it was reported that the median age for infection was 56 years old (7). In an epidemiological study on 41 patients with coronavirus, Huang *et al.* showed that the median age of those affected was 49 years old (6). In a descriptive study performed by Chen *et al.* on 99 patients with coronavirus, the obtained results revealed that the mean age of patients was 55.5 (SD=13.1) (4). The results of a study in Italy reported a median age of 64 years (12). Furthermore, Young *et al.* reported a median age of 47 years in a case series of 18 coronavirus infections in Singapore (13). Also, Arentz *et al.* reported a mean age of 70 years in a case report of 21 COVID-19 patients in Washington (14).

### Age of Diagnosis in Pregnancy

The analysis of the results of studies on COVID-19 in pregnancy reveals that most pregnant women were

between the ages of 20 and 40 years old with the median age of 30 years old. Liu *et al.* reported the age range of pregnant women with coronavirus from 30 to 34 years old (15). Moreover, results from a case-control study in Wuhan, China showed that the mean age of pregnant women with COVID-19 was  $30.9 \pm 3.2$  years old (16). Analysis of 38 pregnant women with COVID-19 in China suggested that the age range of affected women tends to be 26 to 40 years old (8). Also, the results of a case-control study in China on 16 patients with COVID-19 indicated that the mean age was 29.3 (SD=2.9) years old (17). In an analysis performed by Liu *et al.* on 15 pregnant women in China, the results showed that the mean age range was 23- 40 years old and the mean age of affected women was 32 (SD = 5) years old (18). Still in another study carried out by Zhu *et al.* in China, on 9 pregnant women with COVID-19, the age range of women was 25 to 35 years old (11). In a study on 103 pregnant women in China, Dong *et al.* reported a median age 31 for women (age range of 27–38 years old) (19). In addition, Chen *et al.* reported a case-control study in China of 9 pregnant women with the age range of 26 to 40 years old (3).

It is recommended that all pregnant women be screened for coronavirus. Pregnant women with suspected or COVID-19 diagnosis should be identified before they give birth to their neonates and referred to a specific maternity ward or section for delivery. The midwife and the physician should triage the women and advise them about the type of delivery based on the severity of the disease, the patient's condition, and the progress of the childbirth (20).

### Pregnancy Outcome

In a review study by Yee *et al.* conducted on 9032 pregnant women with Covid-19, the results showed that their abnormal laboratory parameters compared to others have increased (21). Also, the results of other studies showed an increased risk of preterm, IUGR, preeclampsia, cesarean section, prenatal infections (11, 19, 22). But the results of some other studies showed that pregnancy did not increase the symptoms of coronavirus and no adverse maternal and neonatal outcomes were observed (15-17).

### Recommendation

After childbirth and discharge from the maternity ward, a daily evaluation is recommended to ensure the recovery of mothers. It seems that providing distance education to pregnant women helps increase their awareness of COVID-19 transmission and symptoms, their self-isolation, and their self-care. Midwives and providers of health services to pregnant women should also receive the adequate and appropriate training in COVID-19 as well as in pregnancy care.

### Discussion

In this study, 25 (OH) D level was higher in Iranian women and their neonates, however, the neonatal anthropometry was not different between Iranian and Afghan refugee women except for neonatal height which was surprisingly higher in Afghans irrespective of their lower 25(OH) D umbilical cord level. Therefore, maternal and neonatal 25(OH) D levels did not influence neonatal anthropometry and this could be related to other factors, including genetics. However, further studies need to investigate this subject independently. Also, no relationship was reported between maternal characteristics and 25(OH) D level. Furthermore, socio-cultural challenges to natural methods of vitamin D intake deserve attention, as both Iran and Afghanistan benefit from sufficient hours of sunlight.

Different serum levels of vitamin D in various ethnicities has been shown in other studies (12- 16). Also a correlation between neonatal and maternal serum levels of vitamin D has been shown in some studies (12, 13). However, in the study by Jacquemyn (2013), no differences were made by taking supplements and gravidity did not affect vitamin D levels (12). This is in accordance with the present study. It can therefore be questioned whether taking vitamin D supplements during pregnancy should be recommended.

There are some controversies on the effects of maternal serum level of vitamin D on anthropometric characteristics of newborns. In a cohort study on 107 women and their neonates, Við Streym *et al.* (17) reported no correlation between anthropometric indexes of neonates and vitamin D level, which is similar to the present study. In contrast, Bowyer *et al.* (13), showed that vitamin D deficiency can influence the neonatal weight which is different with the results of the present study and the study by Við Streym *et al.* (17). Also, Sarma *et al.* (18), reported lower neonatal height and femur length in vitamin D deficient mothers, which is not comparable with the present study and the other mentioned studies (17, 19). A systematic review (20), reported high correlation between maternal and neonatal vitamin D levels, similar to the present study. Therefore despite the fact that vitamin D deficiency is common in mothers and neonates, it is not clear whether prescribing vitamin D supplements during pregnancy can cause any changes in neonatal anthropometric characteristics (21-23). There were also limitations to the present study. For one, participants' nutritional habits were not recorded. This could have led to a better understanding of the potential effects of such habits on this study's results. Also, the Afghan refugee women are expats living in Iran, although their duration of residence in Iran is not known. There could have been cultural or pre and post immigration factors that have led to this study's outcomes. For future studies, these extra information could potentially facilitate a better understanding of the results. Further randomized clinical trials are recommended in order for clearer conclusions to be reached.

## Conclusion

Comparing the results of studies on COVID-19 during pregnancy and that of the general population, it can be concluded that pregnant women develop COVID-19 at a younger age than the general population. It is normal for pregnant women to match the maximum fertility age. On the other hand, according to the review of study results, there is no agreement on the outcome of pregnant women with COVID-19. Due to changes during pregnancy, pregnant women have a higher risk for COVID-19 than other people, perhaps due to the lower mean age of COVID-19 in pregnant women, this leads to less COVID-19 on the adverse pregnancy outcomes.

## Acknowledgments

The authors express their gratitude to all the researchers whose articles were analyzed.

## Funding

No funding or sponsoring organization was involved in the carrying out of this work.

## Authors' Contributions

FR and ZK made a substantial contribution to writing of the paper draft and met the four criteria for authorship recommended by the International Committee of Medical Journal Editors.

## Conflict of Interest

The authors have no conflict of interest.

## References

1. Organization WH. Novel Coronavirus (2019-nCoV) Situation report-9, 29 January 2020. Geneva, Switzerland.2020.
2. Chan JF-W, Yuan S, Kok K-H, To KK-W, Chu H, Yang J, et al. A familial cluster of pneumonia associated with the 2019 novel coronavirus indicating person-to-person transmission: a study of a family cluster. *The Lancet*. 2020; 395(10223): 514-23. [[DOI:10.1016/S0140-6736\(20\)30154-9](https://doi.org/10.1016/S0140-6736(20)30154-9)]
3. Chen H, Guo J, Wang C, Luo F, Yu X, Zhang W, et al. Clinical characteristics and intrauterine vertical transmission potential of COVID-19 infection in nine pregnant women: a retrospective review of medical records. *The Lancet*. 2020; 395(10226): 809-15. [[DOI:10.1016/S0140-6736\(20\)30360-3](https://doi.org/10.1016/S0140-6736(20)30360-3)]
4. Chen N, Zhou M, Dong X, Qu J, Gong F, Han Y, et al. Epidemiological and clinical characteristics of 99 cases of 2019 novel coronavirus pneumonia in Wuhan, China: a descriptive study. *The Lancet*. 2020;395(10223):507-13. [[DOI:10.1016/S0140-6736\(20\)30211-7](https://doi.org/10.1016/S0140-6736(20)30211-7)]
5. Guan W-j, Ni Z-y, Hu Y, Liang W-h, Ou C-q, He J-x, et al. Clinical characteristics of coronavirus disease 2019 in China. *New England Journal of Medicine*. 2020. [[DOI:10.1101/2020.02.06.20020974](https://doi.org/10.1101/2020.02.06.20020974)]
6. Huang C, Wang Y, Li X, Ren L, Zhao J, Hu Y, et al. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. *The Lancet*. 2020; 395(10223): 497-506. [[DOI:10.1016/S0140-6736\(20\)30183-5](https://doi.org/10.1016/S0140-6736(20)30183-5)]
7. Wang D, Hu B, Hu C, Zhu F, Liu X, Zhang J, et al. Clinical characteristics of 138 hospitalized patients with 2019 novel coronavirus-infected pneumonia in Wuhan, China. *Jama*. 2020. [[DOI:10.1001/jama.2020.1585](https://doi.org/10.1001/jama.2020.1585)] [[PMID](#)] [[PMCID](#)]
8. Schwartz DA. An Analysis of 38 Pregnant Women with COVID-19, Their Newborn Infants, and Maternal-Fetal Transmission of SARS-CoV-2: Maternal Coronavirus Infections and Pregnancy Outcomes. *Archives of Pathology & Laboratory Medicine*. 2020. [[DOI:10.5858/arpa.2020-0901-SA](https://doi.org/10.5858/arpa.2020-0901-SA)] [[PMID](#)]
9. Jamieson DJ, Theiler RN, Rasmussen SA. Emerging infections and pregnancy. *Emerging infectious diseases*. 2006; 12(11): 1638. [[DOI:10.3201/eid1211.060152](https://doi.org/10.3201/eid1211.060152)] [[PMID](#)] [[PMCID](#)]
10. Liang H, Acharya G. Novel corona virus disease (COVID-19) in pregnancy: What clinical recommendations to follow? *Acta Obstetrica et Gynecologica Scandinavica*. 2020. [[DOI:10.1111/aogs.13836](https://doi.org/10.1111/aogs.13836)] [[PMID](#)]
11. Zhu H, Wang L, Fang C, Peng S, Zhang L, Chang G, et al. Clinical analysis of 10 neonates born to mothers with 2019-nCoV pneumonia. *Translational Pediatrics*. 2020; 9(1): 51. [[DOI:10.21037/tp.2020.02.06](https://doi.org/10.21037/tp.2020.02.06)] [[PMID](#)] [[PMCID](#)]
12. Livingston E, Bucher K. Coronavirus Disease 2019 (COVID-19) in Italy. *JAMA*. 2020. [[DOI:10.1001/jama.2020.4344](https://doi.org/10.1001/jama.2020.4344)] [[PMID](#)]

13. Young BE, Ong SWX, Kalimuddin S, Low JG, Tan SY, Loh J, et al. Epidemiologic features and clinical course of patients infected with SARS-CoV-2 in Singapore. *JAMA*. 2020;323(15):1488-94. [[DOI:10.1001/jama.2020.3204](https://doi.org/10.1001/jama.2020.3204)] [[PMID](#)] [[PMCID](#)]
14. Arentz M, Yim E, Klaff L, Lokhandwala S, Riedo FX, Chong M, et al. Characteristics and Outcomes of 21 Critically Ill Patients With COVID-19 in Washington State. *JAMA*. 2020; 323(16):1612-4. [[DOI:10.1001/jama.2020.4326](https://doi.org/10.1001/jama.2020.4326)] [[PMID](#)] [[PMCID](#)]
15. Liu W, Wang Q, Zhang Q, Chen L, Chen J, Zhang B, et al. Coronavirus Disease 2019 (COVID-19) During Pregnancy: A Case Series. 2020.
16. Li N, Han L, Peng M, Lv Y, Ouyang Y, Liu K, et al. Maternal and neonatal outcomes of pregnant women with COVID-19 pneumonia: a case-control study. medRxiv. 2020. [[DOI:10.1101/2020.03.10.20033605](https://doi.org/10.1101/2020.03.10.20033605)]
17. Zhang L, Jiang Y, Wei M, Cheng B, Zhou X, Li J, et al. Analysis of the pregnancy outcomes in pregnant women with COVID-19 in Hubei Province. *Zhonghua fu chan ke za zhi*. 2020;55:E009.
18. Liu D, Li L, Wu X, Zheng D, Wang J, Liang B, et al. Pregnancy and Perinatal Outcomes of Women with COVID-19 Pneumonia: A Preliminary Analysis. Available at SSRN 3548758. 2020. [[DOI:10.2139/ssrn.3548758](https://doi.org/10.2139/ssrn.3548758)]
19. Dong Y, Mo X, Hu Y, Tong S. Epidemiological and Transmission Patterns of Pregnant Women with 2019 Coronavirus Disease in China. Available at SSRN 3551330. 2020. [[DOI:10.2139/ssrn.3551330](https://doi.org/10.2139/ssrn.3551330)]
20. Fakari FR, Simbar M. Coronavirus Pandemic and Worries during Pregnancy; a Letter to Editor. *Arch Acad Emerg Med*. 2020;8(1):21.
21. Yee J, Kim W, Han JM, Yoon HY, Lee N, Lee KE, et al. Clinical manifestations and perinatal outcomes of pregnant women with COVID-19: a systematic review and meta-analysis. 2020; 10(1):1-7. [[DOI:10.21203/rs.3.rs-29550/v1](https://doi.org/10.21203/rs.3.rs-29550/v1)]
22. Antoun L, El Taweel N, Ahmed I, Patni S, Honest H. Maternal COVID-19 infection, clinical characteristics, pregnancy, and neonatal outcome: A prospective cohort study. *Europ J Obstet Gynecol Reprod Biol*. 2020; 252:559-62. [[DOI:10.1016/j.ejogrb.2020.07.008](https://doi.org/10.1016/j.ejogrb.2020.07.008)] [[PMID](#)] [[PMCID](#)].

#### How to Cite This Article:

Rashidi Fakari F, Kiani Z. The Relationship Between Age and COVID-19 in Pregnancy. *J Obstet Gynecol Cancer Res*. 2021; 6 (3) :143-146

#### Download citation:

[BibTeX](#) | [RIS](#) | [EndNote](#) | [Medlars](#) | [ProCite](#) | [Reference Manager](#) | [RefWorks](#)