Acta Medical and Health Sciences, 1 (3): 144-149 (2023)

Advance Access Publication Date: February 2023
DOI : 10.35990/amhs.v1n3.p144-149

REVIEW ARTICLE

Description of term pregnant women in labor with COVID-19: a literature review

Jeffry Iman Gurnadi[1*], Zulfi Nur Rokhmawansyah[2], Sri Quintina Indriyana[3]

1) Departement of Obstetrics and Gynecology, Faculty of Medicine, Universitas Jenderal Achmad Yani, Cimahi, Jawa Barat, Indonesia.
2) Undergraduate Medical Study Program, Medical Faculty, Universitas Jenderal Achmad Yani, Cimahi, Jawa Barat, Indonesia.
3) Departement of Public Health, Faculty of Dental Medicine, Universitas Jenderal Achmad Yani, Cimahi, Jawa Barat, Indonesia.

*Corresponding author. E-mail: jeffry.gurnadi@lecture.unjani.ac.id

ABSTRACT

The coronavirus disease 2019 (COVID-19) pandemic has brought a major impact to health systems and societies worldwide. However, knowledge about the effect of COVID-19 infection during pregnancy and the perinatal outcome is still limited and no specific recommendations available yet on the management of this condition. This was a literature review study on the characteristics of pregnant women, types of delivery, and neonatal outcomes associated with COVID-19. The database used as the literature source were PubMed, AJOG, NCBI, RCOG, and Google Scholar and the search was performed on the articles published from July 2021 to August 2021 that meet the inclusion criteria. Eleven articles were included in this study and were extracted and analyzed using statistic summary. The majority of the term pregnant women in labor with COVID-19 were 21-35 years old (86.4%) and 55.5% were multiparous, with the majority of them delivered their baby through caesarean section (74.3%). The perinatal outcomes demonstrated that a small percentage of newborns experienced low birth weight (10.9%) and asphyxia (3.3%). Further studies are needed regarding vertical transmission from women in labor with COVID-19 to their baby.

Keyword: COVID-19, Perinatal outcome, Pregnancy, Term pregnancy, Type of delivery

INTRODUCTION

Coronavirus disease 2019 (COVID-19) is a disease caused by the infection of Severe Acute Respiratory syndrome Coronavirus-2 (SARS-COV2) virus that is endemic in almost all areas in the world. According to the WHO, the virus outbreak started in Wuhan, China on December 31, 2019.[1] As of May 2020, the virus has infected more than 3 million people worldwide. This outbreak has hit the United States, Italy, and Spain very severely. These three countries have more than 1.3 million cases.[2,3] In Indonesia itself, as of March 14, 2020, there were 96 confirmed cases with huge daily increase in cases. COVID-19 can cause mild,

moderate or severe symptoms. The main clinical symptoms are fever with a temperature of more than 38^0C, coughing, decreased sense of smell, and difficulty in breathing. One of the risk factors for COVID-19 is age and pregnancy.[2,5] In terms of age, individuals infected with COVID-19 in Indonesia are in a younger group compared to foreign citizens (Europeans) who are infected with COVID-19. Risk factors for COVID-19 by age group are divided into critical and non-critical groups. In the critical group, the average age ranges from 49 to 70 years while in the non-critical group, the average age range is from 20 to 47 years.[2]

Comorbidities in individuals infected with COVID-19 can lead to critical conditions and even death. This is evident from the high percentage of deaths of individuals infected with COVID-19 with comorbidities.[6] Clinical and epidemiological data from China with 72,314 case records (confirmed, suspected, diagnosed, and asymptomatic cases) provide an important illustration in the epidemiological curve where there are 62% of confirmed cases with various clinical manifestations depending on the characteristics and risk factors of the patient. In 81% of the confirmed cases, mild pneumonia and non-pneumonia are observed while in 14% who experience dyspnea, the respiratory rate is >30/minute, the oxygen saturation is <93%, with 5% of cases experience respiratory failure, septic shock, and multi-organ dysfunction.[4] There is no significant difference in clinical manifestations between pregnant women infected with COVID-19 and pregnant women not infected with COVID-19. However, in pregnant women infected with COVID-19, complications may arise in mother and fetus.[7] Clinical data from China stated that of 99 pregnant women with COVID-19, 21 gave birth to premature babies.[6] Pregnant women also experience physiological changes that trigger a change in immune response from a Th1 response to a Th2 dominance, which has a protective function for the fetus but makes the mother more vulnerable to exposure to infection.[8] Term pregnant women in labor with COVID-19 are full-term pregnant women who are in labor and going to deliver their baby and are treated in the isolation room in the delivery for facilitating examination of the mother and fetus including examination on the severity of COVID-19 infection and the mother's vital signs. Multidisciplinary monitoring is performed to these mothers by involving pulmonologists/internists, obstetricians, anesthesiologists, midwives, neonatologists, and neonatal nurses.[2,9]

Until recently, no research has shown that one method of delivery has a better outcome than the other. The current delivery method is determined based on individual assessment by taking into account other obstetric indications and the wishes of the family, except for mothers with respiratory disorders who require immediate delivery through a caesarean section.[9] After delivery, neonates born from mothers with suspected or confirmed COVID-19 are divided into asymptomatic neonates and symptomatic neonates.[9] According to a study conducted by Yan Jie and Guo, 86 out of 100 neonates tested for SARS-COV2 receive negative results based on pharyngeal swab sample and 10 neonates with amniotic fluid and cord blood samples also show negative results.[10] Knowledge of the relationship between COVID-19 infection, pregnancy, and fetus condition or outcome is still limited and no specific recommendations are available for treatment. Changes in the immune system is proven to make pregnant women more vulnerable to severe infection, including to severe pneumonia infection. Changes in the cardiopulmonary system in the form of increased diaphragm, increased oxygen consumption, and edema of the respiratory tract mucosa make pregnant women susceptible to hypoxia. Until now, it is still unclear whether COVID-19 infection can pass the transplacental route and infect the fetus (vertical transmission), but there are

adverse maternal outcomes such as low birth weight and asphyxia.[11] Therefore, the authors are interested in conducting a literature study on the description of term pregnant women in labor with COVID-19 based on the the characteristics, type of delivery, and perinatal outcomes.

METHODS AND SUBJECT

This study was a descriptive literature review aimed to illustrate, describe, and explain the various data that has been summarized regarding the description of term pregnant women in labor with COVID-19 based on the characteristics, type of delivery, and perinatal outcomes. Data used in this study were secondary data from various references, such as research journals, annual reports, books, conference results, encyclopedias, and government publications that are relevant with the topic of this study The inclusion criteria for the articles to be included in this study were articles from accredited reputable national and international on term pregnant women with COVID-19 that described characteristics, type of delivery, and perinatal outcomes published from July 2021 to August 2022, while the exclusion criteria include articles published before 2019, articles on non-pregnant women with COVID-19, and articles on term pregnant women in labor with pregnancy complications. Literature search was carried out using the Google search engine using the keywords of COVID-19 infection, pregnancy, maternal, perinatal, clinical manifestation of COVID-19, case series of COVID-19, and neonatal outcome. Database used for searching published articles were PubMed, Researchgate, WHO, ACOG, AJOG, The BMJ, CDC, and the Indonesian Ministry of Health. Keywords for the national journal were characteristics of term mothers with COVID-19 and perinatal outcomes, while the keywords for international journals werepregnancy, maternal, and perinatal COVID-19 infection. Data obtained were then analyzed using descriptive analysis methods.

RESULTS AND DISCUSSIONS

A literature search was carried out by searching articles in the following databases: PubMed, PLoS, Researchgate, WHO, and the Indonesian Ministry of Health. During the literature search, the authors only retrieve relevant international articles published by PubMed, PLoS, and Researchgate. The authors then described, presented, or elaborated the eleven (11) articles retrieved.

Description of term pregnant women with COVID-19 by Age and Parity

The analysis on the literature revealed that 89 cases (41.5%) involved primiparous women with COVID-19 and 125 cases of multiparous women (55.5%) with COVID-19. This shows that COVID-19 infection is more common in multiparous women than in primiparous. This supports a study by Laelatul Q that primigravida mothers are more anxious about the their health and their fetus health during pregnancy that they routinely come for antenatal care visits until the third trimester.[5]

Description of Type of Delivery in Cases of Women infected with COVID-19

The total number of COVID-19 cases from all articles included in this study was 214. A total of 159 cases (74.3%) delivered their baby through caesarean section while the remaining 55 cases (25.7%) had vaginal delivery. Caesarean section was selected based on family considerations and concerns about risk factors for COVID-19 infection with clinical manifestations such as shortness of breath which could lead difficulties for normal or vaginal delivery.[9,13] Changes in the immune system that trigger changes in the immune response of Th1

towards Th2 dominance makes the mother more susceptible to exposure of infection. Changes in the cardiopulmonary system also make pregnant women susceptible to hypoxia; thus, cesarean section is recommended for these women.

In a study conducted by Ilknur Selvi, it is stated that cesarean section is performed to prevent mothers from actively pushing and reduce droplet discharge from mothers with COVID-19.[24]

Perinatal Outcomes in Cases of Women Infected with COVID-19

Of the 212 cases of neonates born, 189 (89.1%) were born with normal birth weight above 2,500 grams while 23 cases (10.9%) were born with low birth weight, or below 2,500 grams. It is concluded that more neonates born with normal birth weight than low birth weight from term pregnant women with COVID-19. Physiological changes in the mother cause a change in the immune response to shift towards Th2 dominance to protect the fetus.[8] In these articles 205 cases (96.7%) involved neonates with an APGAR score of 7-10 in the first minute and 7 neonates (3.3%) were born with an APGAR score of 4-6. This shows that there is no evidence that the maternal factors related to COVID-19 cases disrupt the oxygen supply to the fetus.

Asphyxia is caused by impaired gas exchange and oxygen transport from mother to fetus, resulting in impaired oxygen supply. Neonatal asphyxia can be caused by maternal factors (hypertension, preterm labor, hypotony and post-term pregnancy), umbilical cord entanglement, and birth trauma.[12]

CONCLUSION

Based on the analysis on 11 articles, it is concluded that most term pregnant women in labor COVID-19 are 20-35 years old and multiparous. This shows that COVID-19 infection is more common in multiparous mothers than primiparous. The majority of women with COVID-19 delivered by cesarean section and only 23 (10.9%) and 7(3.3%) neonates born from these pregnant women with COVID-10 experienced low birth weight and mild to moderate asphyxia, respectively.

ACKNOWLEDGEMENTS

The author would like to thank all those who have helped so that this literature review article can be completed.

DECLARATION OF INTERESTS

We hereby declare that there is no conflict of interest in the scientific articles we write.

REFERENCES

1. World Health organization, Coronavirus novel – China, 2020. Availabet at https://www.who.int/csr/don/ 12-january-2020-novels-coronavirus-china/en/. Accessible October 21th 2020. A national Indonesian Physician Association.
2. *Pneumonia COVID-19 Diagnosis and Penatalimal in Indonesia*. PDPI. Jakarta. 2020 pages
3. Centers for Disease Control and Prevention. 2021. Coronavius Disease 2019 (COVID-19). [Online] available at: <https://www.cdc.gov/corona virus/2019-ncov/covid- data/ investigations- discovery /assessing-risk- factors.html> [used December 22, 2020].
4. Cascellla M, Rajnik M, Cuomo a, et al. Features, Evaluation and treatment Coronavirus (COVID-19) [updated 2020 Mar 20]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; Jan 2020.Available from: https://www.ncbi.nlm.nih gov/ books/NBK554776/

5. Laelatul U. Parity, age and gestational age links with care trimester III's length of the perspective coVID-19 at PMB Brida Kitty Dinarum VWY. JIKK 2020;16:133-6
6. Juan w J, NI Z Y, Hu Y Clinical Chart of Coronavius Disease 2019 in China.[J] N Engl J Med. 2020 doi: 10.1056/NEJMoa2002032.
7. Center of Strategic and International Studies. Characteristics and spread of COVID-19 in Indonesia: Preliminary findings. CSIS. Jakarta. 2020.
8. Huang C, Wang Y, li X. Clinical features of patients infused with 2019 novel coronavius in Wuhan, China.[J] Lancet. 2020;395(1 0223):497–506. doi: 10.1016/s0140- 6736(20)30183-5.
9. Indonesian Obstetric and Gynecology Association. Recommendations for the treatment of Corona virus infection (COVID-19) in Maternal (pregnant, copied, and significant). POGI. Surabaya. 2020.
10. Yan Jie, Guo J, Fan C, et al. Coronavius Disease 2019 in Pregnant women: A Report based on 116 Casses. Am J Obstetrics Gynecol 2020;223:111.E1-1.
11. Karimi-Zarchi M, Neamimzadeh H, Dashbeb SA, et al. Vertical Transmission of Coronavius Disease 19 (COVID-19) from infused Presnant Motle to Neonates: A Review. Phetal Pediatr Pathol. 2020;39(3):246-250. 15513815.2020. 10.1080 1747120
12. Peng Y D, Meng K, Guan H Q. [Clinic characteristic and outcomes of 112 cardiovascular disease caused by 2019-nCoV].[J] Zhonghua Xin Xue Guan Bing ZA Zhi. 2020;48 Sens L, Urhoj SK, Kjærgaard J, Dreier JW, Strandberg-Larsen K,
13. Mrs. Andersen am. Feel in fancy and the risk of congenital malfunctions: A cohort study. BMC Pegnoancy Childbirth. 2017;17(1):1–9.
14. Khan S, Peng L, Siddique R, Prophet G, Nawsherwan, Xue M, Liu J, Han, G. Impact of COVID-19 infections on fancy outcomes and the risk of Maternal-to-neonate intrusion transmission of COVID-19 during birth. (2020). Selection Control & Hospital Epidemiology, 41(6), 748-750. 84. ice.2020 10.1017
15. Yu N, li W, Kang Q, Xiong Z, Wang S, Lin X, Liu Y, Xiao J, Liu H, Deng D, Chen S, zinc W, Feng L, Wu J. Clinical features and obstmetric and neonatal outles of pregnant patients with COVID-19 in Wuhan, China: a retroPerspective, single-center, captive study. Lancet Inflow Dis. 2020 may;20(5):559-564. Doi: 10.1016/S1473- 3099(20)30176-6.
16. Chen S, Liao E, CAO D, Gao Y, Sun G, Shao Y. Clinical analysis of pregnant women with 2019 novel coronavirus pneumonia. J Med Virol. Sep. 2020;92(9):1556-1561. doi: 10.1002/jmv.25789.
17. Chen H, Guo J, Wang C, Luo F, Yu X, et al. Clinical characteristic and intrauterine vertical transmission potassium of communication-19 inference in nine manganant women: a retrospective review of medical records. Lancet Inflow Dis. 2020 March;395:809-15. Doi: 10.1016/S0140- 6736(20)30360-3.
18. Zheng T, Guo J, He W, Wang H, Yu H, Yes H. Coronavirus disease 2019 (COVID-19) in fancy: 2 case reports on maternal and neonatal outcomes in Yichang city, Hubei Province, China. Medicine (Baltimore). 2020 Jul 17;99(29):e21334.
19. Khan S, June L, Nawasherwan, Siddique R, li Y, Han G, Xue M, Prophet G, Liu J. Association of COVID-19 with fancy outcomes in health-care workers and general women. Clin Microbiomol Infect. June 2020;26(6):788-790. .03,034. 10.1016

20. Gao, L., Ren, J., Xu, I.. et al. Placental pathology of the third trimester protenant women from coVID-19. Diagn Pathol 16, 8 (2021). doi: 10.1186/s13000-021-01067-6.
21. Ferrazzi E, Poterio L, Savasi V, Vergani P, Preefumo F, Barsecretion S, Bianchi S, Ciriello E, et al. Vaginal delivery in 5 SARS-CoV-2-infselected hicant women in Northern Italy: a retrospective analysis. BJOGH. 2020 Aug;127(9):1116-1121. doi: 10.1111/1471-0528.16278.
22. Maraschini a, Corsi E, Salvatore mA, Donati S; ItOSS COVID-19 working Group. Coronavius and blue in Italy: results of a national population-based cohort study. Ann Mart Super Sanita. 2020 Jul-Sep;56(3):378-389. Doi: 10.4415/ANN_20_03_17.
23. Arnest N, Ira S. The characteristics of pregnant Mother with COVID-19 and extravagant woman in Mother Surakarta Hospital. 2021;8:31-6. 24. Selvi İ, Cevher F, A. A Retrospective Analysis of Clinical features, Maternal and Neonatal Outcomes of COVID-19 s in Obstetrics Clinical in Ankara, Turkey. J Obstetrics Gynecol. 2021;31(2):72-76.