

DOI: <https://doi.org/10.36489/saudecoletiva.2021v11i60p4654-4663>

COVID-19 positive pregnant women, childbirth and risk of vertical transmission: systematic review

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COVID-19 mujeres embarazadas positivas, parto y riesgo de transmisión vertical: revisión sistemática

ABSTRACT

Pregnant women are disproportionately affected by respiratory diseases. These are related to high mortality rates. Objectives: To observe the management with positive COVID-19 pregnant women, the risk of vertical transmission and care during labor. Methods: Systematic review carried out in June 2020, at the Virtual Health Library, descriptors "GESTANTE" and "COVID-19", main subject "Coronavirus infection". Results: 130 articles were found, after eligibility criteria were selected 18. Pregnant women infected in the 3rd trimester had symptoms similar to the other patients. Cesarean deliveries were the most performed, there was no evidence of vertical transmission or by breast milk. Safety measures are recommended, such as isolation and use of personal protective equipment during breastfeeding. Conclusion: The management with infected pregnant women is similar to that of other patients, cesarean delivery was the most used and is not essential. There was no evidence of vertical transmission or contamination by breast milk.

DESCRIPTORS: COVID-19; Pregnant; Vertical transmission.

RESUMEN

Las mujeres embarazadas se ven afectadas de manera desproporcionada por enfermedades respiratorias. Estos están relacionados con altas tasas de mortalidad. Objetivos: Observar el manejo con gestantes COVID-19 positivo, el riesgo de transmisión vertical y el cuidado durante el parto. Métodos: Revisión sistemática realizada en junio de 2020, en la Biblioteca Virtual en Salud, descriptores "GESTANTE" y "COVID-19", tema principal "Infección por coronavirus". Resultados: Se encontraron 130 artículos, luego de seleccionar los criterios de elegibilidad 18. Las mujeres embarazadas infectadas en el 3er trimestre tenían síntomas similares a los de las demás pacientes. Los partos por cesárea fueron los más realizados, no hubo evidencia de transmisión vertical ni por leche materna. Se recomiendan medidas de seguridad, como aislamiento y uso de equipo de protección personal durante la lactancia. Conclusión: El manejo con gestantes infectadas es similar al de otras pacientes, la cesárea fue la más utilizada y no es imprescindible. No hubo evidencia de transmisión vertical o contaminación por la leche materna.

DESCRIPTORES: COVID-19; Embarazada; Transmisión vertical.

RESUMO

Gestantes são afetadas desproporcionalmente por doenças respiratórias. Estas estão relacionadas a altas taxas de mortalidade. Objetivos: Observar os manejos com gestantes COVID-19 positivo, o risco da transmissão vertical e os cuidados durante o trabalho de parto. Métodos: Revisão sistemática realizada em junho de 2020, na Biblioteca Virtual em Saúde; descritores "GESTANTE" e "COVID-19"; assunto principal "infecção por Coronavírus". Resultados: Foram encontrados 130 artigos, após critérios de elegibilidade, foram selecionados 18. Gestantes infectadas no 3º trimestre apresentaram sintomas semelhantes aos demais pacientes. Parto cesáreo foi o mais realizado, não houve evidências de transmissão vertical nem pelo leite materno. Orientam-se medidas de segurança, como isolamento e uso de equipamentos de proteção individual durante amamentação. Conclusão: Os manejos com gestantes infectadas são semelhantes aos de outros pacientes, o parto cesáreo foi o mais utilizado e não é essencial. Não houve evidências de transmissão vertical ou contaminação pelo leite materno.

DESCRITORES: COVID-19; Gestante; Transmissão Vertical.

RECEIVED ON: 10/28/2020 APPROVED ON: 11/10/2020



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INTRODUCTION

The COVID-19 virus manifested in December 2019 in Wuhan in China and spread worldwide, causing a serious public health crisis, which was classified by the World Health Organization (WHO) as a pandemic.¹

Pregnancy is a state of partial immunosuppression that makes pregnant women more vulnerable to viral infections.² Pregnant women are disproportionately affected by respiratory diseases, which are related to high rates of maternal death, spontaneous abortion, teratogenicity and intrauterine growth restriction.³ In this context, although most cases of COVID-19 have mild symptoms, attention is still needed due to historical facts, such as those experienced in severe epidemics, such as the MERS-COV respiratory syndrome, in which about 1/3 of pregnant women infected (IP) died in the Middle East.²

The mode of delivery is also the target of research related to COVID-19, as it is

not known for sure what care the parturient care team needs to take.³ Although it is known that maternal viral infection can affect the fetus in the first trimester of pregnancy, there are few studies related to the disease, and it is also important to analyze the possibility of vertical transmission.⁴

Given this scenario, this study aims to carry out a systematic review to observe the management with positive COVID-19 pregnant women, the risk of vertical transmission and care during childbirth.

METHOD

Systematic review, carried out at the Virtual Health Library in June / 2020. This database was chosen because it contains national and international information sources available in full and free of charge (BIREME, MEDLINE, LILACS, Cochrane Library, LIS, DirEve, Leyes and SeCS). The guidelines of the "Preferred Report for Systematic

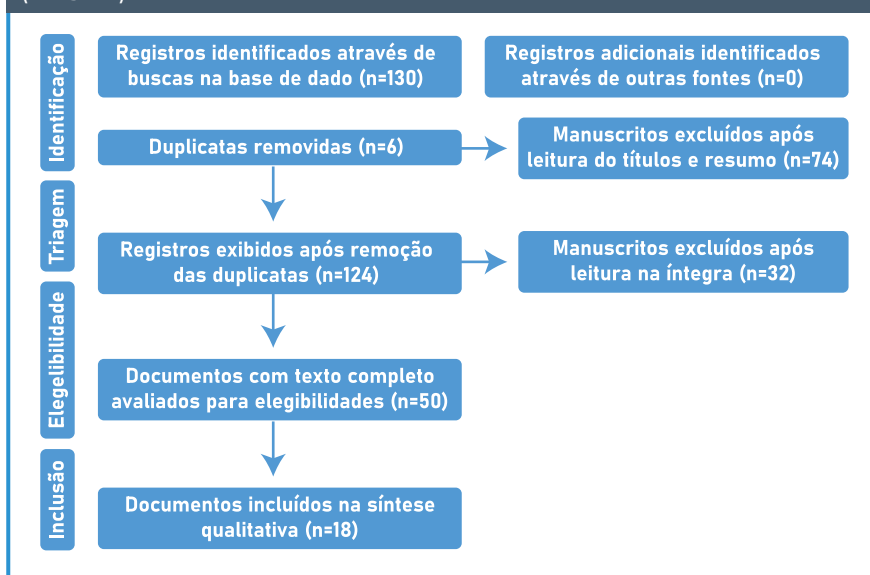
Reviews and Meta-Analysis" (PRISMA) were followed. The descriptors "GESTANTE" and "COVID-19" and the filters were used: full text available, main subject "Coronavirus infection", pregnancy limit, published in 2020. Three researchers performed the search independently.

The selection followed the eligibility criteria, prioritizing articles related to "pregnant women, parturients and newborns (NBs)". Studies on drugs, vaccines, tests, opinion articles and editorial letters were excluded. The entire process had 3 stages: reading the abstract and full titles. It was carried out simultaneously by the researchers, who compared their selections and discussed the differences. Finally, the most relevant results and conclusions were extracted.

RESULTS

130 articles were found; then duplicates and unavailable are removed. 18 remained after using the filters and applying the

Figure 1. Flowchart describing the study search and selection strategy for Preferred Reporting items for Systematic Reviews and Meta-Analysis (PRISMA).



eligibility criteria. The details of the search are outlined in the flowchart of figure 1.

Chart 1 presents a summary of the main findings of each article.

DISCUSSION

Pregnancy is like a state of partial immunosuppression that makes pregnant women more vulnerable to viral infections. This is due to gestational physiological changes that can facilitate the rapid progression of respiratory diseases.¹² Despite this, pregnant women are at relatively low risk for COVID-19, as they are young, healthy and generally asymptomatic.^{5,6} Many authors have observed that IP had symptoms similar to the other patients, but Smith et al. (2020) reported that they have fewer symptoms and may have negative RT-PCR, despite having signs of viral pneumonia.^{7,8,9}

Chart 1- Summary of the main findings related to management with positive COVID-19 pregnant women, vertical transmission and care during childbirth. Brasilia-Brazil, 2020.

N	AUTORES (ANO)	PRINCIPAIS ACHADOS
1	Baergen, et al. (2020)	EC com 20 placentas de GI, 10 apresentaram evidência de má perfusão vascular ou trombose vascular fetal.
2	Carvalho et al. (2020)	EOR de prontuários de GI e RN. As mães tiveram dificuldade respiratória e precisaram de suporte ventilatório, coagulação intravascular disseminada, disfunção de múltiplos órgãos e choque. RNs testaram negativo.
3	Chen, et al. (2020)	E. Clínico com 3 placentas de GI no 3º trimestre com emergência cesariana. Características clínicas semelhantes às de pacientes não grávidas, não houve alteração placentária. RNs testaram negativo.
4	Dashraath, et al. (2020)	RS. Relatos de 55 GI e 46 RNs, não houve transmissão vertical. Mudanças fisiológicas e mecânicas na gestação aumentam a suscetibilidade a infecções, particularmente quando o sistema cardiorrespiratório foi afetado, o que levou à rápida progressão para insuficiência respiratória.
5	Herraiz et al. (2020)	EOR de 203 partos analisados, 7 gestantes referiram sintomas, mas apenas 1 teve RT-PCR positivo. Das 194 assintomáticas, 1 foi positivo. Sintomas semelhantes aos demais pacientes.
6	Indraccolo, U. (2020)	EC de uma GI. Houve dificuldade para rastrear o caso. Gestantes precisam ser orientadas a relatar rapidamente os sintomas, ainda que leves.
7	Iqbal, et al. (2020)	EC de um parto de GI. Ela e a equipe de assistência usaram EPIs. Não houve o clampeamento tardio do cordão umbilical nem o contato cutâneo entre mãe e filho. RN testou negativo, foi alimentado com fórmula e leite materno ordenhado. Mantido longe da mãe até sua recuperação e alta.
8	Lang, G.; Zhao. (2020)	EC de GI. Não houve transmissão do vírus no leite materno. Sugere-se isolar a mãe. A amamentação pode ser praticada após fim do isolamento desde que ela tenha testado negativo.
9	Liu et al. (2020)	EOR com 19 GI. Partos realizados em sala isolada. RNs foram separados imediatamente de suas mães. Não houve sofrimento fetal. RNs testaram negativo.
10	Lyra et al. (2020)	EC de cesariana em GI, sem complicações. RN foi separado da mãe imediatamente e testou negativo. A via de parto deve ser escolhida pelas condições obstétricas com condições de trabalho seguras para equipe de assistência.
11	Mimouni, et al. (2020)	RS. Não houve evidências de transmissão vertical nem de que a gravidez é um fator de risco para maior gravidade da doença. Não há evidências da gravidade da doença em RNs assim como da presença do vírus no leite materno.

12	Peng et al. (2020)	EC de cesariana em GI com características clínicas semelhantes a outros pacientes. RN teve sofrimento intrauterino e testou negativo. Recomenda-se cautela sobre a transmissão vertical.
13	Rasmussen, et al. (2020)	RS. Os dados disponíveis sobre GI são limitados. Deve-se basear nas recomendações de outras infecções respiratórias, como SARS e MERS, que sugerem que grávidas podem ter um curso clínico grave. As intervenções padrão para controlar qualquer infecção respiratória grave são a base do cuidado para GI.
14	Shanes et al. (2020)	Ensaio Clínico com 16 placentas de GI, 1 do 2º trimestre após aborto – apresentou edema de vilosidades e hematoma. 3 do 3o trimestre tinham características de má perfusão vascular materna e arteriopatia. 1 era hipertensa, apesar da associação com distúrbios hipertensivos e pré-eclâmpsia. Essas alterações podem refletir um estado inflamatório sistêmico ou hipercoagulável, que influenciam a fisiologia placentária.
15	Smith et al. (2020)	RS. GI apresentam menos sintomas que a população geral e podem ter RT-PCR* negativo, apesar de terem sinais de pneumonia viral. A incidência de partos prematuros, baixo peso ao nascer, cesárea e internação em UTIN foi maior que na população geral.
16	Yang et al. (2020)	EOR com 7 RNs (4 prematuros). A infecção em gestantes tardias não causa resultados adversos nos RNs. Sugere-se isolamento imediato.
17	Yu et al. (2020)	EOR com 7 GI que apresentaram características clínicas semelhantes a outros pacientes. Os resultados maternos, fetais e neonatais foram bons.
18	Zhang, et al. (2020)	EOR comparativo entre gestantes, sendo 16 infectadas e 45 não infectadas. Todos partos cesáreos, no 3o trimestre. Não houve diferença entre os grupos. RNs de GI testaram negativo.
*EC= Case study. *EOR= Retrospective observational study. *RS= Systematic review. *RN= Newborn. *GI = Infected Pregnant woman. *UTIN= Unidade de Terapia Intensiva Neonatal. *EPIs= Equipamento de Proteção Individual. *RT-PCR= Reverse transcription polymerase chain reaction. SOURCE: The authors.		

Regarding the mode of delivery, Herreiz (2020) reported 1 case of IP that had an eutocic delivery, at term, without complications. Liu et al. (2020) report that, among 19 IP, only 1 had a normal delivery, and Lyra et al. (2020) reported the case of a GI who underwent a cesarean section because the assistance team considered the risk of contamination of the newborn.^{5,10,11} Yang et al. (2020) and Zang et al. (2020) also reported preventive cesarean deliveries. Baergen (2020) and Pu and Liu (2020) reported cases of spontaneous delivery; mothers remained with their newborns and fathers in the delivery room, without complications.^{15, 16} The authors advise, when choosing the mode of delivery, to consider the obstetric conditions of the parturient and the safety conditions of the team.^{5,10,11} According to Chen et al. (2020), the mode of delivery does not necessarily need to be cesarean, but it is recommended in cases of maternal hypoxia, septic shock and/or fetal distress.⁴ The Ministry of Health does not recommend the occurrence of water births, for the safety of the team and the newborn, since the virus is also eliminated in the feces.¹⁴

Three studies analyzed the placenta and found no specific changes, but reported ca-

ses of poor distribution of maternal oxygen and thrombosis, referred to as placental vascular injury.^{15,17,18} Regarding vertical transmission, there is still no robust evidence.¹⁹ However, the guidance of the researchers is that the umbilical cord be clamped and cut quickly during delivery to prevent

The Ministry of Health does not recommend the occurrence of water births, for the safety of the team and the newborn, since the virus is also eliminated in the feces.

the passage of maternal peripheral blood and amniotic fluid.^{15,16} Although some NBs were admitted to the NICU with breathing difficulties and the need for assisted ventilation, the symptoms were not severe and recovery was rapid. These occurrences were unrelated to the virus.^{12,13} However, Vivanti et al (2020) reported what happened at Paris Saclay University Hospitals as the first proven case of vertical transmission of the virus via the placenta.²⁰

There was no transmission of the virus through breast milk.²¹ However, studies suggest that infected mothers are isolated^{22,23}. However, Dashraath et al. (2020) reported that newborns were breastfed normally, following safety protocols, and there was no contamination.¹ The essential care of the mother with the newborn is the use of PPE, such as aprons, gloves, surgical masks and eye protection, to prevent droplets with viral load from reaching the newborn. In cases of IP, skin contact should be suspended.²⁴ The guidelines of the Royal College of Obstetricians and Gynecologists state that breastfeeding and rooming-in is possible as long as safety measures are followed. Furthermore, WHO supports breastfeeding for mothers even if they are infected.²⁵

CONCLUSION

Infected pregnant women in the 3rd

trimester had symptoms similar to the other patients. Cesarean delivery was the most used. There was no evidence of ver-

tical transmission or breast milk. The findings are not conclusive, further studies are recommended. ■

REFERENCES

1. Dashraath P, Wong JLJ, Lim MXK, Lim LM, Li S, Biswas A, et al. Coronavirus disease 2019 (COVID-19) pandemic and pregnancy. *AJOG*. 2020;222(6):521-531. doi: 10.1016/j.ajog.2020.03.021.
2. Liang H, Acharya G. Novel Coronavirus disease (COVI-19) in pregnancy: What clinical recommendations to follow? *AOGS*. 2020;99(4):439-442. doi: 10.1111/aogs.13836
3. Hamed MA. An overview on COVID-19: reality and expectation. *Bull Natl Res Cent*. 2020;44(1):86. doi: 10.1186/s42269-020-00341-9.
4. 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;395:809-815. doi: 10.1016/S0140-6736(20)30360-3.
5. Herraiz I, Folguez D, Villalaín C, Forcén L, Delgado R, Galindo A. Universal screenig for SARS-Cov-2 before labor admission during Covid-19 pandemic in Madrid. *Journal of Perinatal Medicine*. 2020. Doi: 10.1515/jpm-2020-0236.
6. Yu N, Li W, Kang Q, Xiong Z, Wang S, Lin X, et al. Clinical features and obstetric and neonatal outcomes of pregnant patients with COVID-19 in Wuhan, China: a retrospective, single-centre, descriptive study. *The Lancet*. 2020;20(5):559-564. doi: 10.1016/S1473-3099(20)30176-6.
7. Indraccolo U. A pregnant woman and the SARS-CoV-2 infection: how are barriers easily crossed? *Recenti Prog Med*. 2020;111(4):259-260. doi: 10.1701/3347.33190.
8. Iqbal SN, Overcash R, Mokhtari N, Saeed H, Gold S, Auguste T, et al. An Uncomplicated Delivery in a Patient with Covid-19 in the United States. *N Engl J Med*. 2020;382(16): e34. doi: 10.1056 / NEJM2007605.
9. Smith V, Seo D, Warty R, Payne O, Salih M, Chin K L, et al. Maternal and neonatal outcomes associated with COVID-19 infection: A systematic review. *PO*. 2020;15(6): e0234187. doi: 10.1371/journal.pone.0234187.
10. Liu W, Wang J, Li W, Zhou Z, Liu S, Rong Z. Clinical characteristics of 19 neonates born to mothers with COVID-19. *FM*. 2020;14(2):193-198. doi: 10.1007/s11684-020-0772-y.
11. Lyra, J. et al. Cesarean Section in a Pregnant Woman with COVID-19: First Case in Portugal. *Acta Med Port*. 2020;33(6): 429-431. doi: 10.20344/amp.13883.
12. Yang P, Wang X, Liu P, Wei C, He B, Zheng J, et al. Clinical characteristics and risk assessment of newborns born to mothers with COVID-19. *J Clin Virol*. 2020;127: 104356. doi: 10.1016/j.jcv.2020.104356.
13. Zhang L, Jiang Y, Wei M, Cheng BH, Zhou XC, Li J, et al. Analysis of pregnancy outcomes of pregnant women during the epidemic of new coronavirus pneumonia in Hubei. *Zhonghua Fu Chan Ke Za Zhi*. 2020;55(3):166-171. doi: 10.3760/cma.j.cn112141-20200218-00111.
14. Ministério da Saúde. Recomendações para o Trabalho de Parto, Parto e Puerpério Durante a Pandemia da Covid-19 Nota técnica no 9/2020 [internet]. Brasília: Secretaria de Atenção Primária à Saúde; 2020 [citado em: 25 jun 2020]. Disponível em: <http://docs.bvsalud.org/biblioref/2020/05/1095677/notatecnica92020cosmucg-cividapessapsms.pdf>.
15. Baergen RN, Heller DS. Placental Pathology in Covid-19 Positive Mothers: Preliminary Findings. *Pediatr Dev Pathol*. 2020;23(3): 177-180. Doi: 10.1177/1093526620925569.
16. Jie P, Xinghui L. Classification management recommendations for the full prevention and control of perinatal period under the outbreak of new coronavirus pneumonia. *Chinese Journal of Obstetrics and Gynecology*, 2020;55. doi: 10.3760/cma.j.cn112141-20200221-00123.
17. Shanes ED, Mithal LB, Otero S, Azad HA, Miller ES, Goldstein JA. Placental Pathology in COVID-19. *Am J Clin Pathol*. 2020;154(1): 23-32. doi:10.1093/ajcp/aqaa089.
18. Chen S, Huang B, Luo DJ, Li X, Yang F, Zhao Y, et al. Clinical characteristics and placental pathology analysis of three pregnant women infected with novel coronavirus. *J Perinatol*. 2020;49(5):418-423. doi: 10.3760/cma.j.cn112151-20200225-00138.
19. Mimouni F, Lakshminrusimha S, Pearlman SA, Raju T, Gallagher PG, Mendlovic J. Perinatal aspects on the covid-19 pandemic: a practical resource for perinatal-neonatal specialists. *J Perinatol*. 2020; 40(5): 820-826. doi: 10.1038/s41372-020-0665-6.
20. Vivanti AJ, Vauloup-Fellous C, Prevot S, Zupan V, Suffee C, Cao JD, et al. Transplacental transmission of SARS-CoV-2 infection. *Nature Communications*. 2020;11(3572). doi: 10.1038/s41467-020-17436-6.
21. Peng Z, Wang J, Mo Y, Duan W, Xiang G, Yi M, et al. Unlikely SARS-CoV-2 vertical transmission from mother to child: A case report. *J Infect Public Health*. 2020;13(5): 818-820. doi: 10.1016/j.jiph.2020.04.004.
22. Lang Guan-Jing, Zhao H. Can SARS-CoV-2-infected women breastfeed after viral clearance? *J Zhejiang Univ Sci B*. 2020; 21(5): 405-407. doi: 10.1631/jzus.B2000095.
23. Rasmussen SA, Smulian JC, Lednický JA, Wen TS, Jamieson DJ. Coronavirus Disease 2019 (COVID-19) and pregnancy: what obstetricians need to know. *Am J Obstet Gynecol*. 2020; 222(5): 415-426. doi: 10.1016/j.ajog.2020.02.017.
24. Carvalho WB, Gibelli M ABC, Krebs V LJ, Calil VM Laurindo T, Johnston C. Expert recommendations for the care of newborns of mothers with COVID-19. *Clinics*. 2020; 75: e1932. doi: 10.6061/clinics/2020/e1932.
25. Lowe B, Bopp B. COVI-19 vaginal delivery – A case report. *Aust N Z J Obstet Gynaecol*. 2020; 60(3): 465-466. doi: 10.1111/ajo.13173.