LUMEN ET VIRTUS
ISSN: 2177-2789

IMPACTS OF HIV ON PREGNANCY: A LITERATURE REVIEW

https://doi.org/10.56238/levv15n42-003

Submitted on: 01/10/2024 **Publication date:** 01/11/2024

Rafael Soares Barbosa[1], Roberta Lima Silva[2], Lael Mendonça Moraes[3], Luiz Paulo Leite Barros da Cunha Dias[4], Vincícius Alves Borges de Siqueira[5], João Pedro de Carvalho Pereira Mendes[6], Guilherme Matteucci Bezerra Fialho[7], Antônio Coelho e Silva Neto[8], Dara Farias Freitas[9], Victor Botelho de Araújo Faustino[10], José Nilo Ribeiro Neto[11], Thiago Henrique Ferreira Matos[12], Ana Clara Vale Silva[13], Yasmin Nunes Santos[14] and Kellory Silva Oliveira[15]

ABSTRACT

The Human Immunodeficiency Virus (HIV) is a pathogenic agent associated with consequences that involve, above all, the impairment of the immune system of the affected patient, resulting in vulnerability to opportunistic infections. The methodology used in this study was a qualitative review of the literature, where ten articles found in the Pubmed, SciELO and Google Scholar databases of the last five years were selected, aiming to understand the impacts of HIV on pregnancy. In the results found, it was possible to observe that HIV in the gestational period has the impacts of increasing the possibility of developing congenital malformations, intrauterine growth restriction, low birth weight and birth in small size for gestational age; in addition to the chance of dysregulation of the maternal-fetal binomial, when associated with the use of illicit drugs. It is therefore concluded that there is a need for constant surveillance and preparation of the health system for the management of HIV cases during the completion of pregnancy, in view of the possible negative complications associated with this condition.

Keywords: Impacts. HIV. Gestation.

[1] Medical Student, Dom Bosco Higher Education Unit
[2] Medical Student, Dom Bosco Higher Education Unit
[3] Medical Student, Dom Bosco Higher Education Unit
[4] Medical Student, Dom Bosco Higher Education Unit
[5] Medical Student, Dom Bosco Higher Education Unit
[6] Medical Student, Dom Bosco Higher Education Unit
[7] Medical Student, Dom Bosco Higher Education Unit
[8] Medical Student, Dom Bosco Higher Education Unit
[9] Medical Student, Dom Bosco Higher Education Unit
[10] Medical Student, Dom Bosco Higher Education Unit
[11] Medical Student, Dom Bosco Higher Education Unit
[12] Medical Student, Dom Bosco Higher Education Unit
[13] Medical Student, Dom Bosco Higher Education Unit
[14] Medical Student, Dom Bosco Higher Education Unit
[15] Medical Student, CEUMA University

INTRODUCTION

The human immunodeficiency virus (HIV) is the causative agent of acquired immunodeficiency syndrome (AIDS), which is responsible for a large-scale deterioration of the immune system, and which most determinantly infects CD4+ T lymphocytes (LT) and macrophages, as well as dendritic cells (Pinto Neto *et al.*, 2021).

Once the amount of LT-CD4+ decreases below the acceptable threshold, the body loses its cell-mediated immunity, which makes it more susceptible to opportunistic infections (Farias; Souza; Leal, 2021). In this context, vertical transmission can occur during the gestational period, in the peripartum period, which includes labor and birth, or in the postpartum period through breastfeeding. About 35% of transmissions happen in the intrauterine period. (Bekker *et al.*, 2024).

Prenatal care is of fundamental importance. The first care and the first guidelines will guide the pregnant woman in addition to providing security and safe support. Thus, the nursing professional is a figure of substance, not only at the beginning of the gestational period, but throughout it. Efficient care leads pregnant women to develop healthy and self-care habits (Caetano *et al.*, 2024).

Therefore, the present study sought to interpret the data obtained in recent scientific productions that addressed the theme of the impacts of HIV in the gestational period, interspersing the results with discussions about the measures currently taken for the treatment and prevention of the repercussions of the virus on the development of the fetus and the maternal-fetal binomial.

METHODOLOGY

The study is a qualitative literature review, which used the PubMed, Scientific Electronic Library On-line (SciELO) and Google Scholar platforms as a database for searching the scientific articles used as a theoretical basis. Literature published with a time frame from 2019 to 2024 was used. Articles from all languages were selected, but the materials found were full in English and Portuguese, which addressed the impacts of HIV on pregnancy.

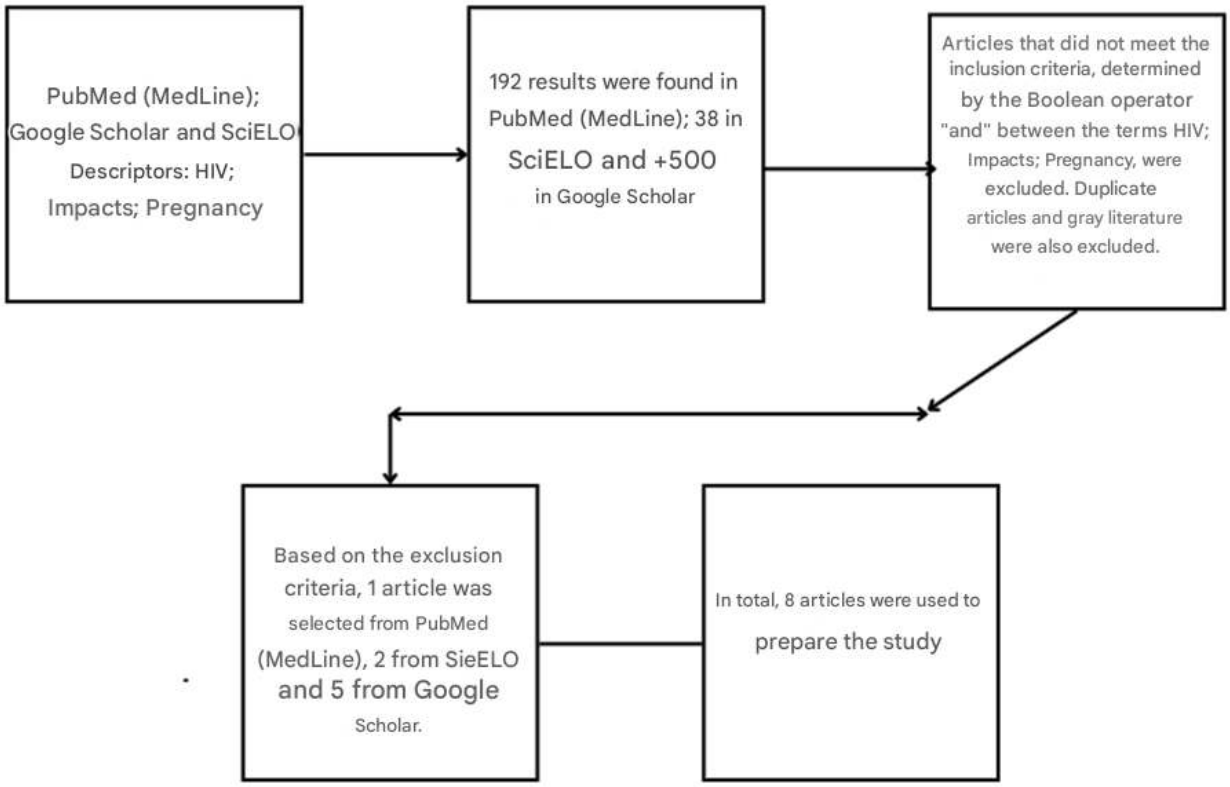
The descriptors used followed the description of the terms DeCs (Health Descriptors) and Medical Subject Headings (MeSH) in English, as shown in Chart 1.

Chart 1 - Search strategy for the study.
“HIV” [MeSH terms] AND “Impacts” [MeSH terms] AND “Pregnancy” [MeSH terms]

Source: Authors (2024).

In this review, the inclusion criteria for filtering the research were three: "HIV"; "Impacts" and "Pregnancy". The choice of these terms and their subsequent search is justified by their relevance to the subject and the way in which the five terms are interrelated in a non-exclusive way, thus justifying their position as inclusion criteria. On the other hand, the exclusion criteria used were books, dissertation project documents, abstracts at events, editorials, literature reviews, isolated case reports, articles that did not meet the inclusion criteria, and duplicate articles, according to Flowchart 1.

Flowchart 1 - Systematization of the filtering of articles for the preparation of the study



Source: Authors (2024).

RESULTS AND DISCUSSION

The choice of articles to be used in this literature review was made by reading the title, abstract and, finally, reading the article in full, with a categorical and thorough analysis of the articles based on the inclusion and exclusion criteria in vogue in the search filters in the databases.

The observations made from the studies used in the present study will be described in Chart 2, according to the title, author and year, following the order of year of publication.

Chart 2 - Articles selected from the PubMed, SciELO and Google Scholar databases

TITLE	AUTHOR, YEAR	OBSERVATIONS
HIV in pregnancy – An update	Chilaka; Horses, 2021	Due to immunosuppression, HIV has the ability to affect the course of various infections during pregnancy, including genital herpes simplex, human papillomavirus, vulvovaginal candidiasis, bacterial vaginosis, syphilis, trichomoniasis, cytomegalovirus, toxoplasmosis, hepatitis B and C, malaria, urinary tract infections, and bacterial pneumonia. tuberculosis and pneumonia caused by *Pneumocystis jirovecii*, appear to be frequent during pregnancy and in the puerperium.
Outcomes in fetuses and newborns exposed to infections during pregnancy.	Da Silva *et al.*, 2021	There was a relative increase in the occurrence of congenital syphilis (28.8%), low birth weight (39%), respiratory distress (20.5%), oligohydramnios (20%), congenital malformation and small for gestational age (10.8%) in cases of gestational HIV in the first trimester. The data obtained indicate the occurrence of unfavorable outcomes for the fetus/newborn when related to neonatal infections.
HIV in pregnancy: Mother-to-child transmission, pharmacotherapy, and toxicity	Red; Murthi; Staud, 2021	There is a window for the teratogenic effects of medications: it is the first trimester of pregnancy. It is during this period that organogenesis takes place. Furthermore, most of the published research on antiretroviral therapy in this specific interval indicates a low association with teratogenicity. The most investigated drugs are efavirenz, zidovudine and dolutegravir. Until recently, dolutegravir was not recommended at conception and early pregnancy due to suspected neural tube defects. However, this recommendation was changed by the US Perinatal Guidelines, and now dolutegravir is considered the most commonly adopted antiretroviral drug throughout pregnancy.
HIV in pregnant women and the challenges for prenatal care	Fernandes *et al.*, 2022	The use of illicit drugs by pregnant women is already critical, and in women with HIV/AIDS the restlessness and distress on the part of health professionals increases even more, due to the negative impacts, physiological consequences that the drug causes for the mother and child binomial. The situation of these women increases the risk of intrauterine HIV transmission, obstetric and fetal complications.
Monocytes and macrophages in pregnancy: The good, the bad, and the ugly	True *et al.*, 2022	A successful pregnancy requires coordinated changes by the maternal immune system to support fetal growth, while simultaneously protecting mother and fetus against microbial biodiversity. As it is the first trimester, it is characterized by a considerable increase in innate immune activity, in particular. This phenomenon favors blastocyst implantation and placental development.
Sociodemographic profile and gestational aspects of	Perotta *et al.*, 2023	The sample was composed mainly of white women in the age group of 13-30 years.

women with HIV/AIDS in Curitiba, Brazil		Regarding prenatal care, this was performed by 93.8% of the pregnant women surveyed, and 45% of them received the diagnosis in the 1st trimester. Access to antiretroviral medication occurred for 82.4% of the pregnant women and for 74.6% the pregnancy outcome was a live birth, regardless of other criteria.
The impact of seropositivity on the mother-infant bond in pregnant women diagnosed with HIV	Rique *et al.*, 2023	Psychological support is important to cultivate feelings and, especially, the maternal-fetal binomial. The relevance of the health team's performance is also highlighted, which understands the moment that the woman is experiencing, making it necessary to provide information about HIV, treatment and everything that involves it, attitudes that provide integrated care that has repercussions on the construction of the bond between mother and baby.
The complications generated by HIV/AIDS in pregnancy: an integrative review	Lisboa *et al.*, 2024	Regarding fetal and neonatal complications, there is an association between small placentas for gestational age (SGA) and low birth weight in newborns of pregnant women living with HIV, as a result of the use of antiretrovirals that include protease inhibitors. In addition, pregnant women with AIDS have a significantly higher risk of preterm birth. It is also observed that a considerable percentage of newborns born to these mothers are born with low birth weight, prematurity and SGA.

Source: Authors (2024).

First of all, Chilaka; Konje (2021) makes a general analysis regarding the possible repercussions of an infectious condition during pregnancy. It is widely evidenced, according to the authors, that immunosuppression from HIV acts as a causative agent of parallel infections, in order to potentiate the harm and probable negative gestational complications.

Similarly, Lisboa *et al.* (2024) states that with regard to fetal and neonatal complications, there is a significant correlation between the presence of SGA placentas and low birth weight in newborns of HIV-positive pregnant women, a phenomenon attributed to the administration of antiretrovirals, particularly those that include protease inhibitors. In addition, pregnant women affected by AIDS show a markedly higher risk of premature births. It is also observed that a significant portion of neonates from these pregnancies manifest conditions of low birth weight, prematurity and SGA.

The cause of these risk factors arising from immunosuppression lies in the relevance that the first trimester has for fetal formation. It is during this time, according to True *et al.* (2022), that the embryonic organism will develop not only the limbs and various tissues of the body, but also the initial mechanisms of the immune system. It is therefore clear that the

immunosuppression caused by HIV prevents the immune development of the embryo, leaving it more susceptible to pregnancy infections.

Due to this situation, Da Silva *et al.* (2021) understands that, in the scenario of gestational seropositivity in the first trimester, there is a clear correlation between the occurrence of congenital syphilis in cases of HIV seropositivity, with an increase of 28.8% in cases than in relation to seronegative pregnancies, as well as a percentage increase in low birth weight cases by 39%, and respiratory distress with a percentage increase of 20.5%. The data obtained generally culminate in the description of negative outcomes for the embryo that will become a fetus and later a newborn.

The reality of the HIV scenario in the first trimester is statistically demonstrated by Perotta *et al.* (2023), pointing out that, in the sample carried out, 93.8% of pregnant women received prenatal care in a coherent way, of which 45% received notification of seropositivity in the 1st trimester of pregnancy. Access to antiretroviral medication occurred for 82.4% of the pregnant women and for 74.6% the pregnancy outcome was a live birth.

Regarding the treatment offered, Cerveny; Murthi; Staud (2021) points out that caution is essential in relation to teratogenicity characteristic of the first trimester of pregnancy. However, the low risk of antiretroviral administration has been evidenced, even in the teratogenic window.

In addition, another relevant criterion addressed was the use of illicit drugs in the first trimester and its correlation with HIV seropositivity. In this context, Fernandes *et al.* (2022), demonstrates that the main aspect impacted is that of the mother-child binomial after birth, due to the dysregulation of the physiological mechanisms that act in the maintenance of the relationship, caused by drugs.

Finally, Rique *et al.* (2023) discusses that there are negative complications in issues ranging from breastfeeding to the mother's self-perception of motherhood. Focus is given to the psychological requirements of HIV infection in the first trimester of pregnancy and how psychological support is essential for maintaining the bond during the gestational process, until delivery and postpartum.

FINAL CONSIDERATIONS

Understanding the relationship between the involvement of pregnancy by the HIV virus and the impacts related to it is essential to guide the direction of public policies necessary for the treatment of complications, as well as the prevention of infection, especially in view of the physiological delicacy of the pregnancy period.

HIV infection during pregnancy is considered a teratogenic risk not only due to the direct action of the virus, but also due to the antiretrovirals administered to pregnant women, whose systemic repercussions throughout pregnancy are not yet fully understood. This risk involves potential impacts on both fetal development and maternal health at different stages of pregnancy, from the first trimester to the perinatal period.

Therefore, the analysis of the literature allows us to understand that the continuous collaboration between the most varied organizational devices available to the health system is of essential importance for the prevention and treatment of the impacts of HIV during pregnancy.

REFERENCES

1. BEKKER, L.-G. et al. Twice-Yearly Lenacapavir or Daily F/TAF for HIV Prevention in Cisgender Women. *New England Journal of Medicine*, 24 jul. 2024.

2. CAETANO, R. et al. Importância de um pré-natal realizado por uma equipe multidisciplinar. *Research, Society and Development*, v. 13, n. 3, p. e10813345350-e10813345350, 27 mar. 2024.

3. CERVENY, L.; MURTHI, P.; STAUD, F. HIV in pregnancy: Mother-to-child transmission, pharmacotherapy, and toxicity. *Biochimica et Biophysica Acta (BBA) - Molecular Basis of Disease*, v. 1867, n. 10, p. 166206, 1 out. 2021.

4. CHILAKA, V. N.; KONJE, J. C. HIV in pregnancy – An update. *European Journal of Obstetrics & Gynecology and Reproductive Biology*, v. 256, p. 484–491, jan. 2021.

5. DA SILVA, A. G. et al. Outcomes in fetuses and newborns exposed to infections during pregnancy. *Revista Brasileira de Enfermagem*, 2021, Vol 74, Issue 3, p1.

6. FARIAS, A. M. DE; SOUZA, W. S. DE; LEAL, L. C. P. Efeitos Do Volume Treinamento Resistido Semanal Sobre O Aumento Na Contagem De Linfócitos T CD4 Em Portadores De Hiv/Aids: Uma Revisão De Literatura. *Brazilian Journal of Development*, 1 jan. 2020.

7. FERNANDES, A. L. D. Revisão da implementação do rastreamento ao HIV/AIDS em gestantes na atenção primária do Sistema Único de Saúde (SUS) no Brasil. *Ufrgs.br*, 2022.

8. FERNANDES, D. L. et al. HIV em gestantes e os desafios para o cuidado no pré-natal. *Revista Pró-UniverSUS*, v. 13, n. 1, p. 108–117, 29 jun. 2022.

9. LISBOA, A. C. L. et al. As complicações geradas pelo HIV/AIDS na gestação: Uma revisão integrativa. *Research, Society and Development*, v. 13, n. 2, p. e12313245120–e12313245120, 28 fev. 2024.

10. PEROTTA, M. et al. Perfil sociodemográfico e aspectos gestacionais de mulheres com hiv/aids de Curitiba, Brasil. *Revista gaúcha de enfermagem*, v. 44, 1 jan. 2023.

11. PINTO NETO, L. F. DA S. et al. Protocolo Brasileiro para Infecções Sexualmente Transmissíveis 2020: infecção pelo HIV em adolescentes e adultos. *Epidemiologia e Serviços de Saúde*, v. 30, n. spe1, 2021.

12. RIQUE, L. L. et al. O Impacto da Soropositividade no Vínculo mãe-bebê em Gestantes Diagnosticada com HIV. *Interação em Psicologia*, Curitiba, v. 26, n. 3, abr. 2023. ISSN 1981-8076. Disponível em: <https://revistas.ufpr.br/psicologia/article/view/78781/48819>. Acesso em: 19 out. 2024. doi:http://dx.doi.org/10.5380/riep.v26i3.78781.

13. SANTOSA, W. B. et al. Perinatal outcomes associated with maternal HIV and antiretroviral therapy in pregnancies with accurate gestational age in South Africa. *AIDS*, v. 33, n. 10, p. 1623–1633, 1 ago. 2019.

14. TRUE, H. et al. Monocytes and macrophages in pregnancy: The good, the bad, and the ugly*. *Immunological Reviews*, v. 308, n. 1, p. 77–92, 21 abr. 2022.