Epidemiological and clinical aspects of pregnant women with HIV attended at the Tropical Diseases Hospital of the Federal University of Tocantins.

ABSTRACT: HIV infection among pregnant women has been on the rise, demanding efforts to prevent vertical transmission. This study analyzed the epidemiological and clinical characteristics of HIV-positive pregnant women treated at the Hospital of Tropical Diseases of the Federal University of Tocantins between 2015 and 2019. Out of the 85 pregnant women analyzed, the majority were between 26 and 34 years old, with 37.64% completing high school. Most resided in Tocantins and had stable partners, with 44.11% unaware of their serological status. Women aged ≥25 years showed lower viral load detection. The majority already had HIV before prenatal care, but only 45.88% started follow-up in the first trimester. Treatment adherence was high, but 14.10% dropped out. The analysis highlighted the need for specific strategies for young pregnant women, emphasizing the importance of prenatal exams for early diagnosis and immediate treatment initiation, reducing vertical transmission. Adherence to antiretroviral therapy (ART) was crucial, although cases of dropout underscored the need for emotional support. The results reinforce the importance of health policies tailored to the needs of HIV-positive pregnant women, aiming to ensure a holistic and effective approach to this vulnerable population.

Keywords: Pregnant Women; Vertical Transmission; Human Immunodeficiency Virus.

INTRODUCTION

Sexually Transmitted Infections (STIs) compromise the quality of life, sexual health, reproduction, and child health worldwide. They facilitate HIV transmission and can cause precursor cellular changes leading to cancer (World Health Organization (WHO), 2016). STIs can be caused by different etiological agents such as bacteria, viruses, fungi, and protozoa, transmitted through sexual intercourse and sharing of contaminated needles and piercing objects, as well as during pregnancy, childbirth, or breastfeeding (Brazil, 2017; Focaccia; Veronesi, 2015). In Brazil, the lack of compulsory reporting and population studies conceal the true prevalence of STIs in the population (Pinto et al., 2018), combined with the difficulty in controlling the spread of epidemics, which depend on various integrated factors, making STI control a challenge (Brazil, 2020a). One of the main STIs in Brazil is Human Immunodeficiency Virus (HIV), which attacks the immune system and can lead to Acquired Immunodeficiency Syndrome (AIDS) when untreated (Brazil, 2019).

Due to unprotected sexual activity, the number of AIDS cases in women has increased in recent decades, manifesting as a global occurrence (Oliveira et al., 2014). Becoming an even greater problem, the reproductive age of these women also leads to an increase in vertical HIV transmissions (Lima et al., 2014). This increases the challenge in tackling AIDS in Brazil, as at least 125,144 of the total patients diagnosed with HIV during the period from 2000 to 2009 were pregnant women (Brazil, 2019).

HIV present during pregnancy can pose challenges for the woman and her family's life, especially in preventing mother-to-child transmission of the virus. However, the most impactful preventive measure against vertical transmission is adherence to antiretroviral treatment during pregnancy (Faria et al., 2014). Nevertheless, factors such as late diagnosis, low adherence to technical recommendations, and the quality of care, especially in regions with lower service coverage and less access to healthcare networks, can hinder the reduction of vertical HIV transmission rates, making this scenario a crucial point to address (Brazil, 2010). Thus, establishing a bond with affected patients and understanding the factors that can interfere with

infection management and compromise adherence is of paramount importance. Studying this information, obtained during outpatient visits, allows highlighting such difficulties and devising mitigating strategies, as well as contributing to reducing the incompleteness of information, promoting well-being in the lives of pregnant women and reducing the risks of vertical transmission.

In this scenario fits the Tropical Diseases Hospital of the Federal University of Tocantins (HDT-UFT), the first university hospital in the state of Tocantins, located in Araguaína, a strategic region for regional development, being in contact with the southern and southeastern regions of Pará and the southern regions of Maranhão and Piauí, serving municipalities in these regions, among others, and being a reference in the treatment of infectious and parasitic diseases (Tocantins, 2020). This study was conducted there, aiming to describe and analyze the epidemiological and clinical characteristics of HIV-positive pregnant women treated at HDT-UFT from January 2015 to December 2019.

MATERIAL AND METHODS

The study employed a retrospective approach, analyzing the medical records of pregnant women who began their care at HDT-UFT between 2015 and 2019. A total of 85 records meeting the established inclusion criteria were collected, excluding pregnant women who initiated care outside of the mentioned period. Sociodemographic and clinical information was gathered from the medical records and categorized. Sociodemographic characteristics included age group, level of education, self-declared race/color, place of residence, sexual partnership, serological status of sexual partners, and condom use. Clinical characteristics encompassed the timing of HIV infection diagnosis, gestational trimester at the start of care, presence of STIs, level of the last viral load recorded before childbirth, prescribed ART, and adherence or discontinuation of care during pregnancy.

Data were collected, tabulated, and categorized using Microsoft Office® software. The resulting database underwent data refinement following the methodology of (Rouquayrol; Silva, 2018). Subsequently, qualitative data underwent statistical analysis using Fisher's Exact Test and the Chi-square Test ($p \leq 0.05$). Quantitative data were subjected to tests for normality and homoscedasticity, and upon meeting these assumptions, they underwent analysis of variance, with treatments evaluated using the F Test. In both analyses, the probability of type I error was set at ≤ 0.05.

This study was approved by the Research Ethics Committee (CEP) of the Hospital for Tropical Diseases at the Federal University of Tocantins (HDT-UFT), under informed opinion number 3,987,059.

RESULTS AND DISCUSSION

Demographic characteristics of pregnant women with HIV treated at HDT-UFT from January 2015 to December 2019

The participation pattern over the years has shown consistency, with the presence of 15 pregnant women in 2015 and 2016, 19 pregnant women in 2017, 20 pregnant women in 2018, and 16 pregnant women in 2019, resulting in an annual average of 17 pregnant women. The age profile fit into the expected reproductive age range (15 to 49 years) (UNAIDS, 2020), with a mean age of pregnant women of 26 ±10.6 years, with a minimum age of 15 and a maximum of 41 years, with 48.24% between 26 to 35 years; 34.11% aged 19 to 25 years; 9.41% aged 15 to 18 years; and 8.24% aged 36 to 41 years.

The significant participation of young pregnant women in this study is in line with previous studies, which observed significant percentages of 18.3%, 20.6%, and 28.2% of young pregnant women (Pinheiro Campos et al., 2020; Silva et al., 2018; Teixeira et al., 2020). Factors such as early age at sexual initiation, incorrect or inconsistent condom use, and experimentation with alcohol and other drugs place young people and adolescents at greater risk for sexually transmitted infections (STIs) and HIV (Brazil, 2013). Additionally, biological aspects and various socio-economic, legal, and cultural factors, as well as unbalanced power relations between genders and society's acceptance of violence against women, contribute to women and girls' greater vulnerability to HIV infection (Duarte; Parada; Souza, 2014).

The level of education is expressed in Table 1. Here, incomplete primary education is noted as the second predominant group, aligning with the Epidemiological Bulletin of the

Ministry of Health between 2007 and 2019 (Brazil, 2019), where although the majority of cases (36.6 thousand) occurred in women with at least incomplete high school, 33.2 thousand occurred in women with incomplete or lower secondary education. A trend that aligns with that found in this study. Although a significant portion of cases occur in women with a low level of education, this does not seem to be the predominant factor for the occurrence of infection, as it affected women with different levels of education, with the majority having higher levels of education.

In this regard, the scientific literature varies regarding the predominant level of education, with some authors recognizing low education as the predominant factor (Caran dos Santos et al., 2019; Paes et al., 2017), while others observed a high proportion of women with higher levels of education (Soares de Lima et al., 2017), with no consensus on this issue.

Table 1 – Percentage of Education Level of HIV pregnant women attended at HDT-UFT, Araguaína, Tocantins, during the years 2015 to 2019.

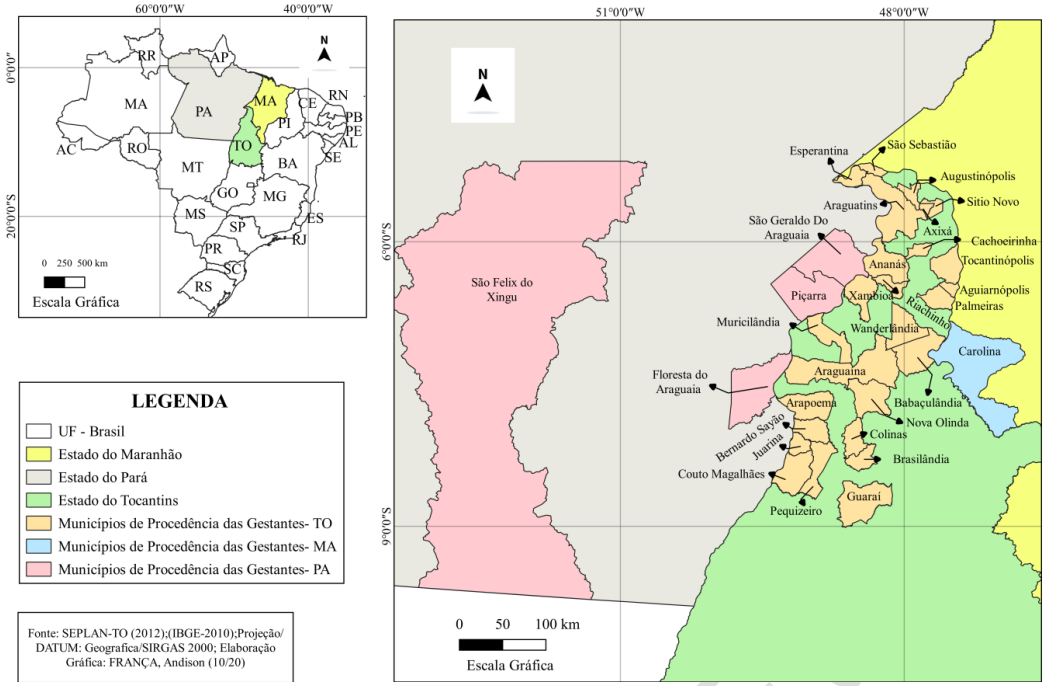
	Education Degree (%)						
Again	**EFI**	**EFC**	**EMI**	**EMC**	**ESI**	**ESC**	**NI**
2015	26,66	13,33	26,66	33,33	-	-	-
2016	33,33	-	13,33	13,33	6,66	20,00	13,33
2017	15,79	5,26	15,79	57,90	-	5,26	-
2018	20,00	15,00	5,00	55,00	-	5,00	-
2019	18,75	31,25	18,75	18,75	6,25	6,25	-
General	**22,35**	**12,94**	**15,30**	**37,64**	**2,35**	**7,05**	**2,35**

Caption: EFI (Incomplete Elementary Education); EFC (Complete Elementary Education); EMI (Incomplete High School); EMC (Complete High School); ESI (Incomplete Higher Education); ESC (Complete Higher Education); NI (Not Informed).

The self-declared color in 91.76% (78) of the records of attended pregnant women was brown, followed by 5.9% (5) who were white, 1.17% (1) black, and 1.17% (1) yellow. This pattern follows the same observed by (De Figueiredo Júnior et al., 2019; Figueiró-Filho et al., 2005; Teixeira et al., 2020). This pattern is explained by the Brazilian population itself, which is predominantly brown (Brazilian Institute of Geography and Statistics (IBGE), 2020), and is not related to HIV contagion; however, this data is collected because it is proposed by the compulsory notification form of the Ministry of Health.

The pregnant women involved in this study resided in 31 municipalities from three different states, namely: Tocantins (90.58%), followed by Pará (7.06%) and Maranhão (2.35%) (Figure 1; Table 2). Of these, 10.58% were residents of rural areas.

Figure 1: Place of residence of HIV pregnant women treated at HDT-UFT, Araguaína, Tocantins, during the years 2015 to 2019.



Source: Survey data.

It is possible to observe that the majority of pregnant women involved in the research resided in other municipalities, whether in the states of Tocantins, Pará, or Maranhão. Out of the total of 85 pregnant women attended to, 9 resided in rural areas, with 3 of them in the state of Pará and 6 in the state of Tocantins. Out of this number, 2 abandoned treatment, and only 1 of them returned, attributing her abandonment to a move to the rural area, which imposed difficulties in accessing antiretroviral medication. From this, it is possible to identify the importance that HDT-UFT represents in providing specialized care, not only to the local population but also in attending to patients residing in other municipalities and states.

Sexual partnership was also observed in this study, where there was a predominance of monogamous relationships, through stable unions or dating, corresponding to 80% of the total pregnant women attended to, evidencing that a fixed relationship is not a protective factor for HIV infection. Furthermore, a percentage of 25% of seroconcordant partners was verified among stable partners. This fact is of interest when combined with the large number of records of ignored condom use, as well as the percentage of participants who did not use condoms (Table 3).

It is observed that in most records, this information was ignored, followed by a predominance of partnerships that do not use condoms, as well as those who use them sporadically, and only a minority reported using condoms. The incompleteness of the medical records made it impossible to understand relevant information such as condom use, which could hinder the development of effective public policies.

Condom use is a method of great importance in the sexual context, as it not only protects against STIs but also prevents unwanted pregnancy (Ramos; Araújo, 2020). In fact, in some cases, condom use is not common until the beginning of the relationship with the HIV-positive partner, with the majority not being accustomed to using it (Fernandes et al., 2017). However, in this research, unlike what is recorded in the literature, where the majority starts to use condoms frequently, few couples were using them, and four used them sporadically. It is worth mentioning that the time of diagnosis and dialogue with the sexual partner are important factors in the habit of using condoms, sometimes more influential than sociodemographic variables and the partner's serology (Silva et al., 2019). However, the safest prevention option for serodifferent couples consists of adequate adherence to Antiretroviral Therapy (ART), reducing viral load and maintaining it undetectable, thus reducing the risk of HIV transmission (Brazil, 2022). It is important to emphasize that correct and regular condom use is recommended in all sexual relationships; however, one must consider the dynamics and agreements within sexual relationships, the desire to have children, access to prevention supplies, as well as other aspects of personal projects (Brazil, 2018).

Table 2: Place of residence of HIV pregnant women treated at HDT-UFT, Araguaína, Tocantins, during the years 2015 to 2019, and their respective quantities expressed in absolute and relative frequency.

Municipalities of Origin	Amount
Ananás- TO	1
Araguaína- TO	37
Araguatins- TO	2
Arapoema- TO	1
Arguianópolis- TO	1
Augustinópolis- TO	1
Axixá do Tocantins- TO	1
Babaçulândia- TO	1
Bernardo Sayão- TO	2
Brasilândia- TO	1
Cachoeirinha- TO	1
Carolina- MA	2
Colinas do Tocantins- TO	3
Couto Magalhães- TO	4
Esperantina- TO	1
Floresta do Araguaia- PA	1
Guaraí- TO	2
Juarina- TO	1
Muricilândia do Tocantins- TO	1
Nova Olinda- TO	3
Palmeiras- TO	1
Pequizeiro- TO	1
Piçarra- PA	1
Riachinho- TO	1
São Félix do Xingú- PA	1
São Geraldo do Araguaia- PA	3
São Sebastião do Tocantins- TO	3
Sítio Novo do Tocantins- TO	2
Tocantinópolis- TO	3
Wanderlândia- TO	1
Xambioá- TO	1
Total	**85**

The female gender has faced submission over the years, exclusion from decision-making in both public and personal life, domestic and sexual violence, limited sexual freedom, and little power to decide on protected sex. This is reflected in a significant vulnerability, increasing the epidemiological incidence of infection in this population (Damasceno et al., 2017). Sociodemographic variables such as age, level of education, self-declared race, and sexual partnership were associated with maternal viral load, aiming to observe if such characteristics had an influence on the detection and non-detection of HIV viral load in pregnant women (Table 4).

Table 3: Percentage reported on the use of condoms by sexual partners of HIV pregnant women attended at HDT-UFT, Araguaína, Tocantins, during the years 2015 to 2019.

	Condom Use (%)			
Again	**Yes**	**No**	**Irregular Use**	**Uninformed**
2015	6,66	40,00	13,33	40,00
2016	-	26,66	13,33	60,00
2017	-	26,30	-	73,70
2018	5,00	25,00	-	70,00
2019	-	-	-	100,00
General	**2,35**	**23,52**	**4,71**	**69,41**

The observed p-value in the age variable demonstrated a significant difference between pregnant women under 25 years old and those aged 25 years or older, with the former mostly presenting detectable viral load (n=22/26,19%), while the latter mostly had undetectable viral

load (n=39/46,43%). This suggests that these women adhered better to recommendations and prescribed antiretroviral treatment, achieving viral suppression, in contrast to young adult pregnant women (<25) who did not achieve undetectable viral load, implying inadequate adherence to recommendations and treatment.

Table 4 - Association of Viral Load in pregnant women with HIV treated at HDT/UFT, from January 2015 to December 2019, according to age, level of education, self-declared color and sexual partnership.

VARIABLE		VIRAL CHARGE				Total		p-values
		DT		NT				
		N	%	N	%	N	%	
Age	< 25 years	22	26,19	10	11,90	84	100,00	0.0001*
	≥ 25 years	13	15,48	39	46,43			
Education level	IF	13	15,66	17	20,48	83	100,00	0.8179
	IN	21	25,30	32	38,55			
Self-proclaimed heart	Curtain	33	39,76	43	51,81	83	100,00	0.1221
	Black	0	0,00	1	1,20			
	White	0	0,00	5	6,02			
	Yellow	1	1,20	0	0,00			
Fixed partner	Yes	25	30,12	42	50,60	83	100,00	0.2573
	No	9	10,84	7	8,43			

Legend: DT (detectable), NT (non-detectable), EF (Elementary Education), EM (High School). (*): Significant difference for Fisher's Exact Test.

Clinical characteristics of pregnant women treated at HDT-UFT from January 2015 to December 2019

Prenatal examinations conducted during pregnancy are of great diagnostic importance for detecting diseases such as HIV infection, as a portion of women discover they have HIV precisely during gestation, leading to efforts to prevent mother-to-child transmission of HIV. This factor was taken into account during data collection (Table 5), being relevant for the effectiveness of treatment aimed at reducing viral load and preventing vertical transmission.

In addition, the gestational period at the time of seeking specialized care was analyzed, with a prevalence of women in the first trimester of pregnancy, followed by the second trimester, and lastly the third trimester (Table 6), a period where intrauterine transmission is higher, requiring all pregnant women to be under treatment at this time (Brazil, 2010).

According to the Clinical Protocol and Therapeutic Guidelines for the Prevention of Vertical Transmission, testing aimed at preventing vertical transmission of HIV should be performed at the first prenatal consultation, preferably during the first trimester of pregnancy, again in the third trimester, and is also recommended upon admission to the maternity ward (Brazil, 2022). It was observed that the majority of pregnant women in this study began their follow-up in the first trimester, allowing for proper treatment initiation compared to other pregnant women.

Table 5: Percentage at the time of diagnosis of HIV infection in pregnant women treated at HDT-UFT, Araguaína, Tocantins, during the years 2015 to 2019.

Diagnosis of HIV infection (%)		
Again	**Prenatal**	**Before prenatal care**
2015	46,66	53,33
2016	40,00	60,00
2017	36,84	63,15
2018	40,00	60,00
2019	56,25	43,75
General	**43,53**	**56,47**

The presence of sexually transmitted infections (STIs) during pregnancy can lead to complications during gestation and childbirth (Pinheiro Campos et al., 2020). Therefore, the occurrence of these infections during the gestational period was taken into consideration. The presence of syphilis was recorded with greater predominance, which aligns with governmental

reports on coinfections (Brazil, 2020a). Syphilis coinfection has the highest prevalence among pregnant women with HIV, which in turn can facilitate vertical transmission of the virus. This may be related to the absence of condom use mentioned earlier, since unsafe sexual practices are the main factors in the transmission of HIV and syphilis (Acosta; Gonçalves; Barcellos, 2016).

Table 6: Percentage of gestational trimester where o the first care for HIV pregnant women attended at HID-UFT, Araguaína, Tocantins, took place between 2015 and 2019.

	First Service		
Again	**1st quarter**	**2nd quarter**	**3rd trimester**
2015	20,00	60,00	20,00
2016	33,33	53,33	13,33
2017	57,89	36,84	5,26
2018	60,00	25,00	15,00
2019	50,00	25,00	25,00
General	**45,88**	**38,82**	**15,30**

And only one pregnant woman presented vulvar condyloma during pregnancy, caused by the Human Papillomavirus (HPV), which is the most common sexually transmitted infection. Young women aged 20 to 35 are at high risk of HPV infection due to being more sexually active; additionally, the altered hormonal environment and decreased immunity during pregnancy may favor the presence or persistence of this infection (Pandey et al., 2019).

Knowledge of the level of HIV Viral Load (VL-HIV) is of great importance in relation to the risk of vertical transmission of HIV. In pregnant women who use ARVs and maintain VL-HIV levels below 1,000 copies/mL, the vertical transmission rate of HIV is less than 1% (Brazil, 2022). The values obtained from viral load allow for monitoring of the infected pregnant woman, assisting in the evaluation of the response to antiretroviral therapy, and help in defining the mode of delivery, as this is one of the factors associated with the risk of maternal-child transmission of HIV (Brazil, 2010). This information is expressed in Table 7.

Due to the majority percentage of pregnant women with VL below 1,000 copies/mL, it can be said that adherence to treatment was of great importance. For this treatment, different medications were used to compose the drug therapy for pregnant women. Among the different options of drugs available, tenofovir (TDF), zidovudine (AZT), lamivudine (3TC) belonging to the class of Nucleoside/Nucleotide Reverse Transcriptase Inhibitors (NRTIs), Efavirenz, which is a Non-Nucleoside Reverse Transcriptase Inhibitor (NNRTI), were used. Protease Inhibitors (PIs) such as Atazanavir (ATV), Lopinavir (LPV), and Ritonavir (RTV) were also used, as well as an Integrase Inhibitor (INI), Raltegravir (RAL).

Table 7: Percentage of HIV Viral Load level in pregnant women treated at HDT-UFT, Araguaína, Tocantins, during the years 2015 to 2019.

	Viral Load (VL) %			
Again	**ND**	**50 to <1,000 copies/mL**	**From 1,000 copies/mL**	**IN**
2015	46,66	20,00	33,33	-
2016	53,33	13,33	26,66	6,66
2017	68,42	15,79	15,79	-
2018	65,00	20,00	15,00	-
2019	50,00	25,00	25,00	-
General	**57,65**	**18,82**	**22,35**	**1,18**

Caption: NI: (Not Informed).

Thus, from these medications, six different antiretroviral regimens were used in order to promote adherence and viral suppression. The different ART regimens were designated with the letters A, B, C, D, E, and F, representing each of the schemes used.

Letter "A" represented the therapy composed of TDF/3TC and ATV/r (atazanavir/ritonavir); letter "B" represented the drugs AZT/3TC and LPV/r (lopinavir/ritonavir); letter "C" represented the ART composed of TDF/3TC/EFZ; letter "D" was used to represent the ART composed of AZT/3TC and LPV/ATV; letter "E" represented the ART that included the drugs TDF/3TC and RAL, and letter "F" represented the scheme composed of AZT/3TC and RAL (Table 8).

Table 8: Percentage of Antiretroviral Therapies used to treat HIV pregnant women treated at HDT-UFT, Araguaína, Tocantins, from 2015 to 2019. Results in %

			Again			
‘	**2015**	**2016**	**2017**	**2018**	**2019**	**General**
A	6,67	6,67	5,27	-	-	**3,53**
B	86,66	33,33	-	-	-	**21,17**
C	6,67	60,00	89,46	55,00	31,25	**50,60**
D	-	-	5,27	-	-	**1,18**
E	-	-	10,52*	45,00	68,75	**25,88***
F	-	-	-	-	6,25*	**1,17***

Legend: A (TDF+3TC+ATV/r); B (AZT+3TC+LPV/r); C (TDF+3TC+EFZ); D (AZT+3TC+ LPV+ATV); E (TDF+3TC+RAL); F (AZT+3TC+RAL). ART that replaced previous schemes received (*), indicating that the value will exceed 100%.

The combination of three antiretrovirals should be included in initial therapy, requiring the use of two drugs belonging to the NRTI/NtRTI class, and a third belonging to another class (NNRTI, PI, or INI). Thus, the preferred initial therapy for adults consists of the combination of 3TC/TDF (NRTI/NtRTI) along with the use of dolutegravir (DTG), an Integrase Inhibitor (INI) (Brazil, 2018). However, HIV-positive women at risk of pregnancy and pregnant women should not use this regimen due to potential safety concerns related to congenital defects that may occur in babies born to women who were using DTG at the time of conception (Brazil, 2018; WHO, 2018). Therefore, according to Circular Letter No. 11/2020 published by the Ministry of Health, its use is recommended for pregnant women from the second trimester of pregnancy onwards (Brazil, 2020b).

The preferred initial regimen for pregnant women in the first trimester of pregnancy consists of the combination of TDF/3TC, which has dosage ease, with alternatives in cases of contraindication being the use of AZT/3TC as the first option, and the use of Abacavir (ABC)/3TC as the second option (Brazil, 2022).

The third drug to be used to compose the initial ART consists of EFV if pre-treatment genotyping confirms the absence of mutations for NNRTIs, and if this is not available or indicates resistance, use ATV/r. In the impossibility of composing ART with NNRTI and with the preferred PI, ATV/r, boosted darunavir with ritonavir (DRV/r) can be used. Regarding the use of RAL, it can be considered in pregnant women who start prenatal care or ART late and in cases of contraindication to DTG (Brazil, 2020b).

Thus, following the recommendations of the Ministry of Health, the six regimens used in pregnant women followed at HDT-UFT comprised the use of two drugs belonging to the NRTI/NtRTI class such as AZT, TDF, and 3TC, with a predominance of the use of the TDF/3TC combination.

The regimen composed of tenofovir, lamivudine, and efavirenz (TDF/3TC/EFV) was predominant among the treatments used by pregnant women, followed by therapy composed of TDF/3TC and RAL. Simplified therapies with fixed-dose combinations that allow the use of different drugs in a single tablet are one of the factors that facilitate adherence (Brazil, 2018).

Taking into account the changes in ART during pregnancy, which are sometimes necessary for better adaptation of pregnant women to therapy, it was observed that three pregnant women had their medications changed, using two antiretroviral regimens during pregnancy. Two pregnant women had their regimens changed in 2017 and one in 2019.

In 2017, two pregnant women needed to have their regimens changed. Both changes consisted of switching EFV present in the TDF/3TC/EFV regimen to RAL, due to the occurrence of nausea after EFV use according to one of the pregnant women. The other change was motivated by the genotyping result, which indicated resistance to EFV. In 2019, the change in therapy occurred in the TDF/3TC and RAL regimen, with a switch to AZT/3TC and RAL due to possible intolerance to TDF, in which the pregnant woman reported dizziness, nausea, asthenia, and diarrhea with the previous regimen, and improvement after this change. Such effects may not occur, as observed by Delicio (2017) when comparing the occurrence of adverse effects between regimens using AZT and TDF in pregnant women.

Pregnancy is the situation in which care should be prioritized with a view to starting ART, whose therapy is indicated for all pregnant women regardless of clinical and immunological criteria and should be maintained after delivery (Brazil, 2018). It is important to emphasize that maximal suppression of HIV RNA depends not only on the potency of the

therapeutic regimen used but also on adherence by the patient, as inadequate adherence is detrimental to both the pregnant woman and increases the risk of vertical transmission. Therefore, it is necessary to assess and treat conditions that can affect adherence, such as depression, alcohol, and drug use, seeking to improve the health of the pregnant woman and reduce the risk of vertical transmission (Brazil, 2022).

Adherence to antiretroviral therapy is a key factor in preventing vertical transmission, as it promotes viral suppression, and it is necessary for pregnant women to use the prescribed treatment correctly and regularly to succeed against vertical transmission. In this regard, it can be observed that a large part of the pregnant women followed at HDT-UFT correctly adhered to treatment, accounting for 85.90% of the total, while 14.10% abandoned therapy during pregnancy, as shown in Table 9.

Table 9: Percentage of adherence and abandonment to treatment of HIV pregnant women treated at HDT-UFT, Araguaína, Tocantins, during the years 2015 to 2019.

	Treatment during pregnancy (%)	
Again	**Accession**	**Abandonment**
2015	80,00	20,00
2016	80,00	20,00
2017	100,00	0,00
2018	75,00	25,00
2019	93,75	6,25
General	**85,90**	**14,10**

Adherence to therapy was evaluated based on the information recorded in the outpatient records. In cases where it was possible to verify the prescription of antiretroviral therapy (ART) and the continuity of follow-up through appointments, it was found that the pregnant woman had adhered to the treatment. On the other hand, in the records where there was no record of appointments during pregnancy, it was identified that the pregnant woman had discontinued follow-up, resulting in the abandonment of medication treatment. It was observed that these pregnant women had been without medication for more than three months, according to criteria established by Technical Note No. 208/09 of the Ministry of Health (Brazil, 2009).

The history of abandonment was considered a means to understand the profile of HIV-positive patients and the possible causes of treatment discontinuation, aiming to mitigate the possibility of abandonment during pregnancy. Among the pregnant women who adhered to treatment (85.9%), it was observed that six of them had already abandoned therapy in previous years, with records of previous alcohol, cigarette, and illicit drug use. One of the patients reported that a change of residence made it difficult to access antiretroviral medications, resulting in treatment abandonment. Additionally, among the pregnant women who adhered to ART, four resorted to alcohol during pregnancy, one reported using only tobacco, while another reported using both licit drugs during this period. On the other hand, among the women who abandoned treatment during pregnancy, one of them was a sex worker who used alcohol and illicit drugs, while four others occasionally used alcohol and cigarettes. In the remaining records, there were no records of these habits, suggesting that these patients were not users and simply abandoned outpatient follow-up, making it difficult to associate abandonment with specific habits or occurrences in personal life.

Understanding this profile is of utmost importance, as alcohol consumption by people living with HIV is associated with reduced treatment adherence levels and an unfavorable prognosis, as well as facilitating risk behaviors such as the use of other drugs, increased frequency of depression, and low viral suppression, resulting in negative clinical outcomes (Isoldi, 2019). Such habits, including alcohol and other drug consumption, can also increase the practice of unprotected sex and the number of partners in both men and women.

Furthermore, treatment adherence may vary over time, influenced by specific events in people's lives, such as the occurrence of pregnancy (Martins et al., 2023). Physical, psychological, social, cultural, and behavioral factors, along with sociodemographic aspects and access to health services and medication treatment, are associated with non-adherence (Faria et al., 2014). Adherence to health treatment is understood as the correct use of prescribed medications, with its absence being a multifactorial phenomenon. The success of adherence is associated with the type and complexity of treatment, the bond and level of trust of the patient with health professionals and the service that offers assistance, as well as the patient's social condition, which influences their understanding of the need for treatment (Martins et al., 2023).

This, in turn, has a direct impact on the presence of undetectable viral load, strongly associated with medication adherence. Similarly, other studies point to the relationship between ART adherence and reduction in detectable viral load (Faria et al., 2014; Pimenta et al., 2015; Torres et al., 2020). However, difficulties in maintaining therapy are faced by the patient throughout the process, and therefore, adherence to health treatment is seen as a condition, not a fixed characteristic of the patient (Oliveira et al., 2020). Examples include delayed start of prenatal care, use of illicit drugs, a medication regimen with more tablets, and low family support being associated with low adherence, while emotional support is associated with increased adherence (Faria et al., 2014). This also impacts the fetus, as HIV viral load, being an important factor in the risk of vertical transmission, has been associated with clinical variables related to HIV diagnosis and treatment abandonment, as per the values in table 10.

The majority of pregnant women (40.48%) diagnosed with HIV infection before prenatal care managed to achieve viral suppression, i.e., undetectable viral load. In contrast, 25.0% of pregnant women diagnosed during prenatal care, during pregnancy, had detectable viral load. The significant difference between pregnant women diagnosed before and during prenatal care regarding viral load was confirmed by the p-value (0.0133) obtained. This result suggests that early diagnosis of infection allows for a longer treatment time and, consequently, reduces the viral load to undetectable levels, decreasing the risk of vertical transmission of HIV. It is important to note that pregnant women diagnosed during pregnancy face a higher risk of mother-to-child transmission of HIV due to the presence of detectable viral load. This risk is reduced to less than 1% in pregnant women with viral loads below 1,000 copies/mL (Brazil, 2022).

Table 10 - Association of Viral Load in pregnant women with HIV treated at HDT/UFT, from January 2015 to December 2019, according to HIV diagnosis and treatment abandonment

Variable		Viral charge				Total		p-values
		DT		NT				
		N	%	n	%	n	%	
HIV diagnosis	Before prenatal care	14	16,67	34	40,48	84	100,00	0.0133*
	Prenatal	21	25,00	15	17,86			
Treatment abandonment	Yes	6	7,14	6	7,14	84	100,00	0.5442
	No	29	34,52	43	51,19			

Legend: DT (detectable), NT (not detectable). (*): Significant difference for Fisher's Exact Test.

On the other hand, no association was observed between antiretroviral treatment abandonment during pregnancy and viral load levels (detectable and undetectable) in the present study, as indicated by the p-value of 0.5442, suggesting the absence of significant difference in this aspect. Additionally, the gestational trimester in which follow-up was initiated was another variable associated with maternal viral load (Table 11).

Table 11– Association of Viral Load in pregnant women with HIV treated at HDT/UFT, from January 2015 to December 2019, according to the gestational trimester

	Viral charge							
	DT		NT		Total		Cof Var	p-values
Variable	Average	N	Average	n	n	%	%	
Gestational trimester	2,14	35	1,35	48	84	100,00	35,63	0.0001*

Legend: DT (detectable), NT (not detectable). Cof Var (coefficient of variation). (*): Significant difference for Fisher's Exact Test.

It was observed that 48 pregnant women who started prenatal care around the 1.35th gestational trimester managed to achieve viral suppression, with undetectable viral load, while 35 pregnant women who began prenatal care around the 2.14th gestational trimester had detectable viral load. This reveals that the initiation of prenatal care in pregnant women with HIV allows them to achieve undetectable viral load if it occurs up to 17.55 weeks of gestation. On the other hand, those who began prenatal care around the 27.82nd week of gestation, that is, 194.74 days or 6.46 months, were not successful in viral suppression. The p-value (0.0001) indicated a significant difference between the two means (2.14 and 1.35 gestational trimesters), highlighting the importance of prompt prenatal care during pregnancy.

Early prenatal care during pregnancy provides greater support to pregnant women, increases the number of appointments, and allows for better monitoring, leading them to follow healthcare professionals' recommendations and make appropriate use of the prescribed treatment. This results in reducing the viral load to undetectable levels and minimizing the risk of vertical HIV transmission. According to the Ministry of Health, the importance of prenatal testing and early diagnosis offers significant benefits, including controlling infection in pregnant women, preventing vertical transmission, and starting ART properly, which can be initiated from the 14th week of gestation. This favors an earlier virological response, enabling the achievement of viral suppression as quickly as possible, a determining factor in reducing vertical transmission (Brazil, 2018; Brazil, 2022).

CONCLUSION

The integrated analysis of literature and obtained results provided insights to understand the reality of pregnant women with HIV. One aspect to consider in this study is the significant prevalence of young pregnant women in this condition, highlighting the need for specific strategies for this vulnerable group. Furthermore, the diversity in the educational level of pregnant women suggests a complex relationship between education and HIV infection, indicating the need for personalized approaches for each context. Prenatal exams emerged as a fundamental piece in the early detection of HIV during pregnancy in this study, since the predominant search for specialized care in the first trimester of pregnancy was an important indicator, allowing for the immediate initiation of treatment and significantly reducing the risk of vertical HIV transmission.

Similarly, adherence to ART (Antiretroviral Therapy) was another crucial aspect to prevent vertical transmission. It is encouraging to note that the majority of pregnant women showed good adherence, even though there are some cases of treatment abandonment, which highlights the importance of approaches that consider factors such as substance use, emotional, and social support. The results also highlight the effectiveness of early diagnosis in viral suppression and reducing the risk of vertical transmission. Therefore, ensuring that pregnant women start treatment as early as possible during pregnancy is crucial, which can be facilitated by policies that promote early prenatal exams and facilitated access to health services.

In summary, prenatal exams, early diagnosis, regular monitoring, and adherence to antiretroviral treatment are essential to prevent vertical HIV transmission and ensure the health of both pregnant women and their babies. These conclusions emphasize the ongoing importance of health policies and programs adapted to the diverse needs and socioeconomic realities of HIV-positive pregnant women.

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