Journal of Neonatal Surgery
ISSN(Online): 2226-0439
Vol. 14, Issue 22s (2025)
https://www.jneonatalsurg.com

OPEN ACCESS

Clinical-pathological study of AIDS descriptive criteria and evaluate the role of HIV awareness among infected patients visiting public health centers in Thi Qar Governorate between November 2023 and February 2024

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Cite this paper as: Haider Mohammed alyasiri, Adeeb Abdulally Abdulhussien, Hameed Naeem Mousa, Fadhil Abass, Zainab Mohammed Ali Hasan, Mohammed Hassan Fatihallah, Zainalaabdeen Basim Jawad, Hayder Hasan Chasib, Mustafa Kadhim Kafel, Ahmed Dhiaa Al-Rahman, (2025). Clinical-pathological study of AIDS descriptive criteria and evaluate the role of HIV awareness among infected patients visiting public health centers in Thi Qar Governorate between November 2023 and February 2024. *Journal of Neonatal Surgery*, 14 (22s), 364-370.

ABSTRACT

Acquired immunodeficiency syndrome (AIDS) represents the advanced stage of HIV infection. HIV targets and infects the body's white blood cells, and its incidence has been on the rise in Thi-Qar city, Iraq. This study aims to assess the incidence of HIV infection in this region from 1986 to 2024.This retrospective cross-sectional study was conducted from November 30, 2023, to February 24, 2024. A total of 144 patients diagnosed with AIDS in Thi-Qar province, Iraq, were included. Data were obtained from the Thi-Qar Medical Institute and the Health Directorate's database, following legal and ethical approval. The data collection process involved a thorough review of each patient's medical history and physical examination. HIV diagnosis was confirmed using PCR techniques, and statistical analysis was performed using SPSS software.The Results were among the 144 patients, 117 were male (81%) and 27 were female (19%). The study identified various transmission routes: 7% of patients had a history of blood transfusion, 26% were infected through heterosexual contact, 5% through homosexual contact, 2% through both heterosexual and homosexual contacts, 1% through vertical transmission, 13% through husband-to-wife transmission, and 46% through unknown causes. The incidence of HIV infection gradually increased, from a single case in 1986 to 21 cases in 2019. The number of cases then rose more sharply, reaching a peak of 144 patients by early 2024. The study highlights the increasing incidence of HIV infection in Thi-Qar province, particularly from 2019 to 2024. The most common transmission routes were unknown causes, heterosexual contact, husband-to-wife transmission, blood transfusion, homosexual contact, and vertical transmission. The highest incidence was observed among young adults aged 20-50 years.

Keyword: *AIDS, Thi-Qar, incidence, heterosexual , transmission, HIV..*

1. INTRODUCTION

Human immunodeficiency virus (HIV) is a serious viral infection that attacks the body's immune system, eventually leading to acquired immunodeficiency syndrome (AIDS) in its advance stages. HIV primarily targets white blood cells, weakening the immune response and increasing vulnerability to infections such as tuberculosis, various cancers, and other diseases(Kumah, E.,*et al.*,2003) . As of the end of 2022, approximately 39 million people worldwide were living with HIV, a number that has seen a slight increase in recent years. Notably, 65% of those living with HIV reside in sub-Saharan Africa. The goal is to reduce new infections to fewer than 350,000 by 2030. However, certain regions, including Eastern Europe,

Central Asia, the Middle East, and North Africa, are still experiencing an increase in new infections, particularly among men(van Schalkwyk, C. *et al.*,2004,) . HIV is classified into two main types based on genetic and antigenic differences: HIV-1 and HIV-2(Blut, A. (2016).). HIV-1 is prevalent globally, whereas HIV-2 is largely confined to West Africa. HIV-1 is more easily transmitted than HIV-2 and progresses more rapidly to AIDS(Nyamweya, S.,*et al.*,2013). Transmission of HIV can occur through sexual contact, exposure to infected blood, or from mother to child during childbirth or breastfeeding. The actual rate of transmission is influenced by various factors, including the mode of transmission, the general health of the individuals involved, viral load, the presence of other sexually transmitted infections (STIs), and the use of preventive measures. Understanding these factors is crucial for the development of effective, patient-centered HIV prevention programs (Beres, L. K.,*et al.*,2019). The incubation period for AIDS—the time from initial HIV infection to the appearance of symptoms—can vary. The time to diagnosis depends on the criteria used and the interpretation of those criteria in different studies. Seroconversion, or the development of detectable antibodies against HIV, typically occurs within 40-60 days but can vary widely. The early incubation period does not significantly differ between transfusion recipients and homosexual men, but it is notably shorter in infants infected perinatally, with an average of one year. For transfusion cases, the mean incubation period is approximately 7.66 years. Infectiousness tends to peak shortly after infection and later during the progression to AIDS-related complex and full-blown AIDS (Anderson, R. M., & Medley,1998). In 2019, around 38 million people were living with HIV, and 690,000 died from HIV-related illnesses. Since the epidemic began in the early 1980s, over 32.7 million people have died from HIV-related conditions. Despite this, there were about 39% fewer HIV-related deaths in 2019 compared to 2010(ani, C.,*et al.*,2021). The most common causes of death among people with HIV include tuberculosis (33.4%), septicemia (23.8%), advanced HIV disease (9.1%), meningitis (7.4%), other pulmonary infections (5.1%), and Kaposi's sarcoma (4.5%)(Sani, M. U., Mohammed, *et al.*,2006). Without treatment, HIV infection can lead to severe illnesses, such as tuberculosis (TB), cryptococcal meningitis, severe bacterial infections, and cancers like lymphomas and Kaposi's sarcoma. HIV also exacerbates other infections, including hepatitis C, hepatitis B, and mpox(1). Common symptoms of HIV infection include fatigue, muscle pain, skin rash, headaches, sore throat, oral candidiasis, significant weight loss, swollen lymph nodes, joint pain, night sweats, and diarrhea(Syndrome, A. I. (2024).). HIV diagnosis involves detecting antibodies or antigens in urine, saliva, or blood. A diagnosis is confirmed when a positive ELISA test is followed by a positive test for HIV DNA or RNA, typically using a PCR test. HIV antibodies or antigens generally become detectable in the blood within three months(Mominur Rahman,*et al* .,2021). Effective antiretroviral therapy (ART) helps control the replication of HIV in infected individuals, increases CD4 cell counts, prolongs the asymptomatic phase, slows disease progression, and reduces the risk of transmission(Bhatti, A. B.,*et al* .,2016). The aim of the study was calculate and describe the frequency and distribution of AIDS in Thi Qar (2024).

2. METHODS

Study design and setting

In this cross sectional retrospective study that was performed from 2023/11/30 to 2024/2/24. 144 patients diagnosed as AIDS in Iraq/ Thi Qar province the information were taken after taking the legal and ethical permission from the data base of the Thi-Qar medical institute and Health Directorate which includes complete history and physical examination. Age , sex, occupation, the time of diagnosis, previous diseases, previous operations, their history with hemophilia and blood diseases and history of sexual contact. HIV can be diagnosed in laboratory using two techniques:

The PCR (Polymerase Chain Reaction) Technique:

PCR is a highly sensitive method used to detect the presence of the actual HIV virus in the body. This technique can identify the virus as early as within three months of exposure. The results are measured in copies per milliliter (copies/mL), which quantifies the amount of viral genetic material in the blood.

The Enzyme-Linked Immunosorbent Assay (ELISA) Technique:

ELISA is a diagnostic technique used to detect antibodies produced by the immune system in response to HIV infection. Unlike PCR, ELISA is not effective within the first three months after exposure because it relies on the detection of antibodies, which take time to develop. Patients undergoing therapy for HIV are typically prescribed Viraday tablets, which are taken once daily at night. Viraday is a combination medication that includes Efavirenz, Emtricitabine, and Tenofovir Disoproxil Fumarate. All the registered infected patients were included with no exclusion criteria. SPSS program was used for the statistical analysis**.**

3. RESULTS

Distribution of Participants by Sex

The table results indicate that the percentage of males was the highest among participants, reaching 81% of the total sample, while the percentage of females was 19%. This result reflects the demographic distribution of the sample studied, which may indicate the presence of factors influencing participant selection or the nature of the study itself. Understanding this distribution is important when analyzing the results and relating them to other variables, as biological and gender differences can play a role in explaining the studied phenomena.

Table 1: Frequency and Percentage of Male and Female Participants

Sex	N%
Male	81 %
Female	19%

Distribution of Cases Based on Mode of Transmission

The table results indicate the distribution of disease cases according to the transmission routes. The highest percentage of cases, 46%, was idiopathic, followed by blood transfusion cases, 7%. Heterosexual cases accounted for 26% of cases, while homosexual cases constituted only 5%. Mixed cases (both homosexual and heterosexual) were also recorded, accounting for 2%, and vertical transmission was 1%. Finally, spousal transmission accounted for 13% of cases. These percentages reflect the diversity of transmission routes and emphasize the importance of exploring all factors influencing disease spread.

Table 2: Frequency and Percentage of Different Modes of Transmission in Patient Cases

Cases patient	N%
Unknown	46%
Blood transfusion	7%
Heterosexual	26%
Homosexual Both homo and heterosexual	5% 2%
Vertical	1%
Husband -wife	13%

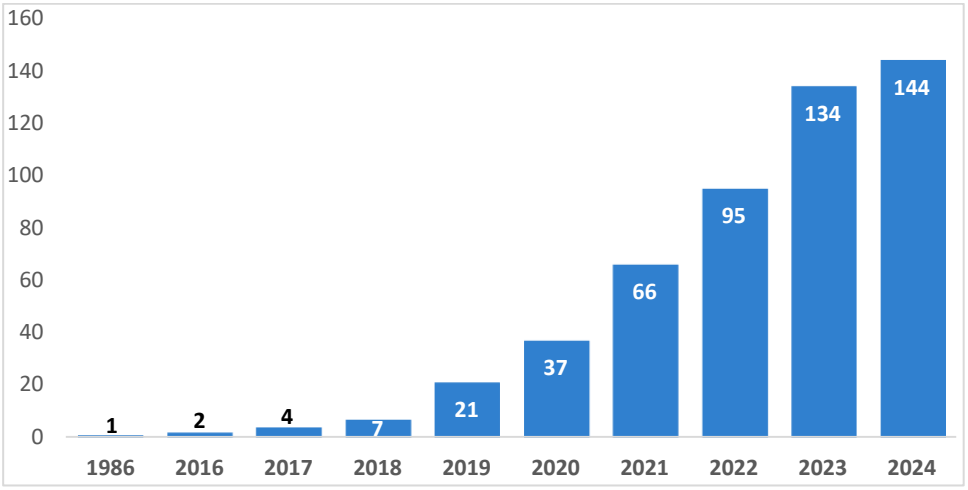

Fig 1: The incidence rate increase gradually from single patient in 1986 till 2019(21 patients) when it start to increase steadily till the early 2024(144 patients) when it reaches the peak.

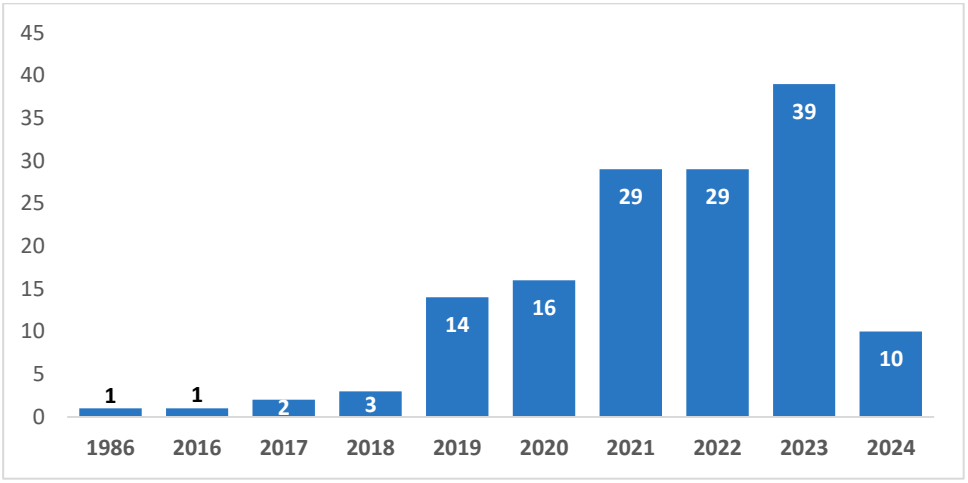

Fig 2: Number of cases recorded in 2019 (14) and 2020(16) and then increase suddenly in 2021(19) and 2022(29)and increase again in 2023 to become 39 patients

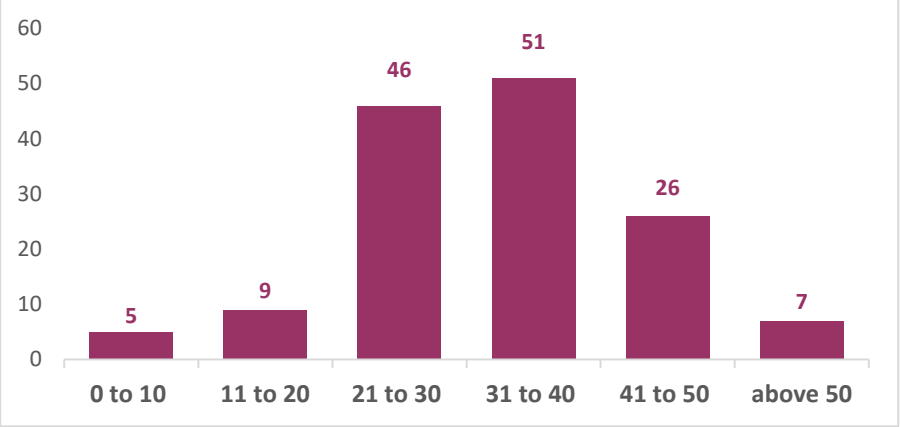

Fig 3: The maximum age for the infected patients is 21-30y(46) patients and 31-40y(51) patients and then decreasing in 41-50y (26) patients and above 50 (7) patients

In this study 123(85%) patients were on therapy and 21(15%) patients dropped off therapy.(Fig 6)

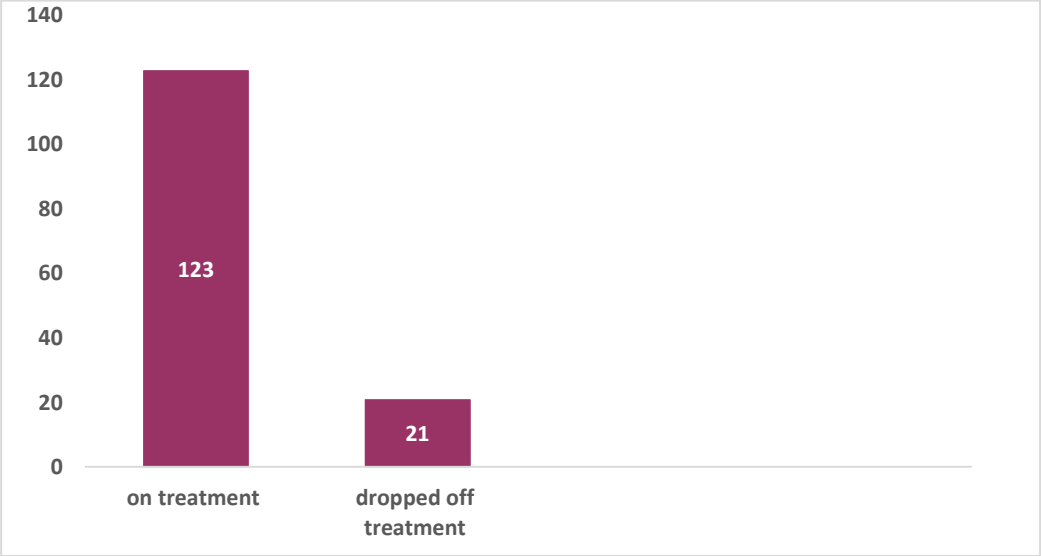

Fig 4: In this study 123(85%) patients were on therapy and 21(15%) patients dropped off therapy

Comparison of Age Distribution and Total Cases Across Different Regions

The table results compare the distribution of cases by age group in Dhi Qar Governorate with some other regions. In Dhi Qar Governorate, the 25- to 44-year-old age group comprised 74.6% of the total cases, while in other regions such as Kansas (37.9%), Mississippi (39.5%), Wisconsin (34.4%), and Birmingham (39.7%), the percentage was much lower. On the other hand, the percentage of cases over 55 years in Dhi Qar was only 2.9%, significantly lower than in other regions where the percentages were higher, such as Kansas (21.3%), Mississippi (33.2%), Wisconsin (40%), and Birmingham (20.8%). These age differences reflect the prevalence of the disease in different regions and the onset of cases, suggesting that the disease began in Dhi Qar more recently than in other regions.

Table 3: Age Group Distribution of Cases in Thi Qar and Other Regions

Category	Thi Qar	Kansas (12)	Mississippi (13)	Wisconsin (14)	Birmingham (15)
Total Cases	144	3,533	9,873	6,840	4,634
Age Distribution					

25–44 years (%)	**74.6%**	**37.9%**	**39.5%**	**34.4%**	**39.7%**
55+ years (%)	**2.9%**	**21.3%**	**33.2%**	**40%**	**20.8%**

4. DISCUSSION

The results of our study were compared with data from regions with populations similar to that of Thi Qar, such as Kansas (Bhatti et al., 2016; White et al., 2019), as well as cities with slightly larger populations like Asala , and those with slightly smaller populations like Birmingham. A key difference observed is the age distribution of affected patients. In Thi Qar, only 2.9% of patients are aged 55 or older, whereas in other regions, this percentage ranges from 20% to 40%. This discrepancy is largely due to the earlier onset of the disease in other countries, where it began spreading 30 to 40 years ago, while in Thi Qar, a notable increase in cases has been observed only after 2016. Several factors contribute to this difference, including variations in agricultural practices, social behaviors, and religious customs (Asala et al., 2019). Another significant finding is that some patients in Thi Qar remain untreated, primarily due to a lack of awareness regarding the risks associated with the disease. Low educational levels and limited access to healthcare resources further exacerbate this issue. Additionally, the rise in reported cases over recent years can be partially attributed to advancements in diagnostic techniques, which have become a routine part of preoperative assessments (Spicer et al., 2012). These improved methods allow for earlier and more accurate detection of the disease, leading to an apparent increase in incidence rates. A considerable proportion of patients in our study were classified as having an unknown cause of infection. This ambiguity may be due to cultural and religious factors, which could discourage open discussions about the disease. Moreover, significant differences exist in the underlying etiological factors contributing to disease transmission in various regions (Ghys et al., 2018). In some cases, infections are linked to specific occupational or environmental exposures, while in others, they may be associated with genetic predisposition or lifestyle factors. Understanding these variations is crucial for developing effective prevention and intervention strategies tailored to the local population. Our study also highlights a distinct age pattern in newly diagnosed cases. Most newly recorded patients fall within the 20 to 40-year age range (Bossonario et al., 2022). As these individuals age, they are likely to contribute to a higher representation of cases in older age groups in the future. However, at present, the proportion of affected individuals aged 40 and above remains relatively low (Butdabut et al., 2021). This trend underscores the importance of long-term monitoring and follow-up studies to assess how the disease progresses within this population over time.

5. CONCLUSION

Incidence of infection are in sequence of unknown cause, heterosexual, husband to wife, blood transfusion, homosexual, heterosexual and vertical, increasing incidence from 2019 till 2024 and more in young patients from 20-50years

Recommendations

We can examine the strategies that other cities have employed in managing and controlling the spread of the disease. By analyzing the steps they took, we can gain valuable insights into the developments they made along the way, helping us to implement effective measures in our own efforts to combat the disease.

Funds

great thanks to the college of medicine and university of Thi-Qar for their helps to perform this study.

Acknowledgment

Thanks a lot for all the medical team that help us in conducting this study. Thanks to the awareness campaigns conducted by the Ministry of Agriculture and the farmers' commitment to the procedures, while the population's commitment was less than that.

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