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Original Research

Characteristics and outcomes of patients diagnosed with HIV during emergency department encounters

ED encounters: newly diagnosed HIV patients

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Abstract

Aim: To characterize the clinical spectrum and short-term hospital outcomes of patients diagnosed with human immunodeficiency virus (HIV) during emergency department (ED) visits or ED-initiated hospitalizations.

Methods: This retrospective observational study was conducted in a tertiary care emergency department between November 1, 2023, and November 30, 2025. Adult patients (≥18 years) who underwent Anti-HIV testing during ED evaluation or during hospitalization initiated from the ED were included. We extracted demographic characteristics, presenting complaints, laboratory parameters, imaging findings, final diagnoses, and hospital outcomes from electronic medical records. Descriptive statistics summarized the data.

Results: We included 135 patients; the median age was 40 years, and 68.1% were male. At presentation, 75.6% of patients had no previously documented HIV diagnosis. The most common presenting complaints were pregnancy-related conditions (16.3%), trauma (14.8%), and respiratory symptoms (12.6%). Anemia was present in 52.3% of patients, and thrombocytopenia in 21.1%. Computed tomography was the most frequently performed imaging modality (54.1%) and commonly revealed pneumonia and intracranial lesions. Hospital admission occurred in 80.7% of patients, including 19.3% requiring intensive care. Overall, in-hospital mortality was 17.8%, with pneumonia as the leading cause of death.

Conclusion: Patients diagnosed with HIV during ED encounters frequently present with nonspecific complaints and advanced disease manifestations, resulting in high rates of hospitalization and mortality. These findings highlight the critical role of emergency departments in identifying undiagnosed HIV and underscore the need for improved screening strategies and heightened clinical awareness in acute care settings.

Keywords

emergency department, human immunodeficiency virus, hospital outcomes

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Introduction

Despite substantial advances in antiretroviral therapy and screening strategies, human immunodeficiency virus (HIV) infection remains a major global public health concern. A significant proportion of individuals living with HIV are diagnosed at advanced stages of the disease, often after multiple healthcare encounters during which earlier opportunities for diagnosis were missed. Delayed diagnosis is associated with increased morbidity, mortality, and healthcare utilization.[1,2] Emergency departments (EDs) represent a critical point of contact for populations at increased risk for HIV, including patients presenting with undifferentiated medical complaints. In this context, HIV testing in the ED has been emphasized as an important strategy for early diagnosis and linkage to care.[3-5]

Studies conducted particularly in Türkiye have demonstrated that approximately half of people living with HIV have been diagnosed, and that this situation is closely associated with missed opportunities for HIV testing within healthcare services.[6] In this context, it has been shown that healthcare settings—particularly EDs—encounter a substantial number of cases eligible for HIV testing; however, these opportunities are frequently not utilized. For example, in Türkiye, HIV testing was not offered during approximately half of healthcare visits among reported patients despite the presence of indications for testing.[7]

Over the past two decades, ED-based HIV screening strategies have been extensively evaluated.[3-5,8] However, a substantial number of patients with undiagnosed HIV continue to pass through EDs without being identified.[9,10] This diagnostic gap may be attributable both to the heterogeneity of clinical presentations and to the fact that most ED visits occur for complaints that appear unrelated to HIV infection.

Patients newly diagnosed with HIV in the ED frequently present with nonspecific complaints such as respiratory symptoms, systemic complaints, trauma, or pregnancy-related conditions.[9,11] HIV testing is often performed only after imaging studies and laboratory tests reveal findings such as pneumonia, intracranial lesions, or cytopenias, prompting further diagnostic evaluation.[11] The existing literature has largely focused on screening yield, linkage to care, or prognostic biomarkers among people living with HIV.[2,12] However, comprehensive assessments integrating presenting complaints, laboratory abnormalities, imaging findings, and short-term hospital outcomes remain limited. A clearer understanding of these dimensions may enhance clinical awareness and help emergency physicians optimize diagnostic strategies.

This study aimed to investigate the clinical spectrum and hospital outcomes of patients diagnosed with HIV during ED visits or ED-initiated hospitalizations. By simultaneously evaluating presenting complaints, laboratory and imaging findings, and short-term outcomes, this study seeks to address an important gap in the current literature and to define better the role of the ED in the identification of undiagnosed HIV infection.

Materials and Methods

This retrospective observational study was conducted in a tertiary care emergency department (ED) between November 1, 2023, and November 30, 2025. Ethical approval was obtained from the institutional review board prior to study initiation.

Adult patients aged 18 years and older who underwent anti-HIV testing during ED evaluation or during hospitalization initiated from the ED were retrospectively identified through the hospital electronic medical record system. We excluded patients with incomplete clinical, laboratory, or imaging data.

Demographic variables (age, sex), clinical characteristics (presenting complaints, mode of ED arrival, and history of recurrent ED visits), laboratory parameters (white blood cell count, differential counts, hemoglobin, platelet count, mean platelet volume, delta neutrophil index, glucose, liver and renal function tests, electrolytes, and C-reactive protein when available), imaging findings (plain radiography, ultrasonography, computed tomography, magnetic resonance imaging), final diagnoses, and hospital outcomes were extracted and analyzed.

Ethical Approval

The study was approved by the Ethics Committee of the University of Health Sciences, Izmir Faculty of Medicine, Izmir City Hospital Non-Interventional Clinical Research Ethics Committee (Date: 17.12.2025, Decision No: 2025/672).

Statistical Analysis

Statistical analyses were performed using SPSS for Windows version 20.0 (SPSS Inc., Chicago, IL, USA). Given the descriptive and exploratory nature of the study and the absence of predefined comparison groups, only descriptive statistical methods were applied. Categorical variables are presented as frequencies and percentages, and continuous variables are expressed as medians with interquartile ranges (IQR) and minimum–maximum values. No inferential statistical comparisons were performed.

Reporting Guidelines

This study is reported in accordance with the STROBE guidelines.

Results

During the study period, 135 patients who underwent anti-HIV testing either during ED evaluation or during subsequent hospitalization following ED admission were included. The median age was 40 years (IQR: 25; range: 20–87 years), and 68.1% of patients were male. Most patients (67.4%) presented to the ED by self-referral, while the remainder arrived via ambulance. Recurrent ED visits were identified in 17.8% of patients.

Overall, 75.6% (n = 102) of patients had no previously documented HIV diagnosis at the time of presentation. Anti-HIV testing was performed in the ED in 36.0% of cases, in inpatient wards in 39.3%, and in the intensive care unit in 15.6%.

The most frequent presenting complaints were pregnancy-related conditions (16.3%) and trauma (14.8%), followed by respiratory, constitutional, neurological, and gastrointestinal symptoms. Presentations were predominantly nonspecific and often unrelated to suspected HIV infection.

Pre-existing comorbidities were common, most frequently hypertension (20.0%) and diabetes mellitus (12.6%). A wide range of laboratory investigations was performed during initial evaluation. Anemia was observed in 52.3% of patients, and thrombocytopenia in 21.1%.

Imaging studies were frequently utilized. Computed tomography was the most commonly performed modality (54.1%), followed by plain radiography (39.3%), ultrasonography (14.1%), and magnetic resonance imaging (8.9%). Common imaging findings included pneumonia, cholecystitis, and intracranial mass lesions.

Among hospitalized patients, final diagnoses encompassed a broad spectrum of conditions, including infectious diseases, trauma-related injuries, neurological disorders, and pregnancy-related conditions.

Regarding disposition, 16.3% of patients were discharged directly

from the ED. Hospital admission occurred in 80.7% of patients, including 61.5% admitted to inpatient wards and 19.3% requiring intensive care unit admission. Four patients (3.0%) left the hospital against medical advice.

Overall, in-hospital mortality was 17.8% (*n* = 24). The most common cause of death was pneumonia, followed by hematologic and gastrointestinal causes, central nervous system–related causes, and neurotoxoplasmosis. The detailed data are provided in Supplementary Tables 1-3.

Discussion

In this study, we found that the majority of patients diagnosed with HIV during ED visits or ED-initiated hospitalizations did not have a previously documented diagnosis at the time of presentation. These patients most often presented with nonspecific complaints. Consistent with prior studies, HIV infection was rarely suspected based solely on initial presenting symptoms.[9,11] Patients required extensive diagnostic evaluation and experienced high rates of hospital admission, intensive care unit (ICU) utilization, and in-hospital mortality. Our findings support the concept that the ED represents a critical yet frequently underutilized setting for the early diagnosis of HIV infection.

Our study demonstrates that HIV testing is generally not offered sufficiently in healthcare services, resulting in the persistence of late diagnoses. In Türkiye, HIV testing was not recommended for approximately 78% of patients despite the presence of indications for testing. National data indicate that emergency departments (EDs) represent the healthcare setting with the highest concentration of missed opportunities across all healthcare encounters. The high rate of missed opportunities observed in emergency departments suggests that these settings are being used suboptimally for the early diagnosis of HIV.[7]

Although EDs are increasingly recognized as a key setting for HIV detection, most prior studies have focused on screening strategies or testing yield rather than the broader clinical context in which diagnoses are made. As a result, emergency physicians have had limited insight into how undiagnosed HIV infection manifests in terms of presenting complaints, diagnostic findings, and short-term outcomes. This knowledge gap directly affects clinical decision-making, risk stratification, and discharge planning in the ED.

This study provides a detailed characterization of patients incidentally identified as anti-HIV positive during ED encounters by integrating presenting complaints, laboratory abnormalities, imaging findings, and short-term hospital outcomes. While previous ED-based studies have largely focused on screening strategies, diagnostic yield, or linkage to care, our findings offer a more comprehensive clinical portrait of this population and address an important gap in the emergency medicine literature.

A key finding of this study is that more than three-quarters of patients did not have a previously documented diagnosis of HIV infection. This proportion is comparable to rates reported in prior ED-based imaging and screening studies.[11,13] Consistent with earlier reports, HIV infection was rarely suspected based solely on presenting complaints.[9,11] In our cohort, the most common reasons for ED presentation included pregnancy-related conditions, trauma, and respiratory symptoms, further supporting the limited utility of symptom-based clinical suspicion for identifying undiagnosed HIV. Similar patterns were described by Spierling et al., who reported that imaging findings such as pneumonia or intracranial lesions often serve as clues prompting suspicion of HIV in the ED setting.[11] Likewise, the high prevalence of respiratory complaints and pneumonia-related imaging findings in our study underscores the importance of maintaining a broad differential diagnosis when evaluating such patients.

Laboratory abnormalities were common in our cohort, with more than half of patients exhibiting anemia and approximately one-fifth demonstrating thrombocytopenia. These findings are consistent with the known hematologic manifestations of untreated or advanced HIV infection. Although our study was not designed to assess prognostic biomarkers, the observed elevation in inflammatory markers—particularly C-reactive protein—is in line with prior studies suggesting that severe acute inflammatory responses among ED patients living with HIV are associated with serious infections and adverse outcomes.[12] These findings further support the notion that many patients were diagnosed at a clinically advanced stage of disease.

Diagnostic imaging played a significant role in patient evaluation and indirectly in the detection of HIV infection. Computed tomography was the most frequently utilized modality, with pneumonia and intracranial pathologies among the most common findings. Previous imaging-focused studies have emphasized that opportunistic infections and mass lesions detected during ED imaging often represent the first indication of underlying HIV infection.[11] In our study, the identification of conditions such as neurotoxoplasmosis reinforces the importance of considering HIV in the differential diagnosis when advanced imaging reveals atypical or severe pathology, particularly in younger or previously healthy patients.

Hospital outcomes in our cohort reflected the severity of illness at presentation. More than 80% of patients required hospital admission, approximately one-fifth required ICU admission, and the in-hospital mortality rate was notably high at 17.8%. This finding is consistent with prior studies demonstrating increased morbidity and mortality among patients diagnosed with HIV at later stages of disease.[1,2] Pneumonia was the leading cause of death, aligning with existing literature identifying respiratory infections as a major cause of mortality among hospitalized patients with advanced or undiagnosed HIV.[1,11]

Our findings also support concerns raised in prior systematic reviews and randomized studies regarding the limitations of both targeted and non-targeted ED HIV screening strategies.[3-5,8] Despite increasing advocacy for routine screening, a large proportion of patients in our study were diagnosed only after hospital admission or ICU evaluation. This delay suggests that reliance on symptom-based or risk-based testing may be insufficient, particularly in high-volume ED settings.

Limitations

This study has several limitations. First, its retrospective and single-center design may limit the generalizability of the findings to other healthcare settings. Second, due to the nature of retrospective data collection, detailed information regarding HIV transmission routes, duration of infection, prior treatment history, place of residence, marital status, immunological status (CD4 cell counts), viral load levels, and long-term clinical outcomes was not consistently available and therefore could not be analyzed. Additionally, the absence of inferential statistical analyses limited our ability to identify independent predictors of adverse outcomes, including the need for intensive care and mortality. Finally, post-discharge follow-up data were not available, precluding assessment of longer-term

prognosis. Despite these limitations, this study provides real-world data on the clinical spectrum and short-term hospital outcomes of patients diagnosed with HIV during emergency department encounters, highlighting the important role of acute care settings in identifying previously unrecognized HIV infection.

Conclusion

In conclusion, patients diagnosed with HIV during ED visits or ED-initiated hospitalizations frequently present with nonspecific complaints, significant laboratory and imaging abnormalities, and high rates of hospital admission and mortality. These findings underscore the critical role of the ED in identifying undiagnosed HIV infection and highlight the need for improved, systematic screening strategies and increased clinical awareness among emergency physicians. EDs represent a crucial opportunity for early diagnosis and improved patient outcomes.

Declarations

Ethics Declarations

This study was approved by the Ethics Committee of the University of Health Sciences, Izmir Faculty of Medicine, Izmir City Hospital Non-Interventional Clinical Research Ethics Committee (Date: 17.12.2025, Decision No: 2025/672). The study was conducted in accordance with the principles of the Declaration of Helsinki.

Animal and Human Rights Statement

All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

Informed Consent

Written informed consent was obtained from all participants included in the study.

Data Availability

The datasets used and/or analyzed during the current study are not publicly available due to patient privacy concerns but are available from the corresponding author on reasonable request.

Conflict of Interest

The authors declare that there is no conflict of interest.

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Author Contributions (CRediT Taxonomy)

Conceptualization: İ.K.
Methodology: T.Y.K.
Validation: İ.K.
Formal Analysis: T.Y.K.
Investigation: İ.K.
Writing – Original Draft Preparation: İ.K.
Writing – Review & Editing: T.Y.K.
Visualization: İ.K.

AI Usage Disclosure

Declaration of generative AI and AI-assisted technologies during the preparation of this work: The author(s) used the free version of ChatGPT for language editing. After using this tool/service, the author(s) reviewed and edited the content as needed and take(s) full responsibility for the content of the publication.

Abbreviations

CD4: Cluster of differentiation 4
CRP: C-reactive protein
CT: Computed tomography
ED: Emergency department
HIV: Human immunodeficiency virus
ICU: Intensive care unit
IQR: Interquartile range
SPSS: Statistical package for the social sciences
STROBE: Strengthening the reporting of observational studies in epidemiology

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