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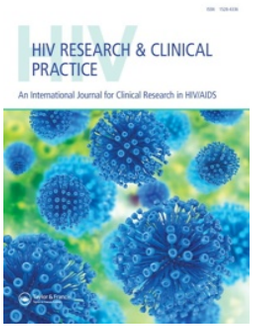

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Hypocoagulability among people living with HIV at Hoima Regional Referral Hospital, Western Uganda: a cross-sectional study

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RESEARCH ARTICLE

Hypocoagulability among people living with HIV at Hoima Regional Referral Hospital, Western Uganda: a cross-sectional study

Abdisalam Ahmed Sandeyl, Mohamed Jayte, Farah Dubad Abdi, Hassan Omar Ali, Abdisamad Guled Hersi, Zakarie Abdullahi Hussein, Venance Emmanuel Mswelo, Abdalla Ahmed Deifa, Abishir Mohamud Hirsi and Jacinto Amandua

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ABSTRACT

Background: Coagulation abnormalities are an under-recognized complication among people living with HIV. Despite widespread antiretroviral therapy (ART), hematologic dysfunction, including coagulation and platelet abnormalities, continues to contribute to morbidity in sub-Saharan Africa.

Objective: This study aimed to determine the prevalence, associated factors, and clinical features of hypocoagulability among people with HIV at Hoima Regional Referral Hospital (HRRH).

Methods: We conducted a cross-sectional study at HRRH, Western Uganda, from May to July 2025. Sociodemographic, clinical, and behavioral data were collected via questionnaires and chart review. Laboratory evaluation included platelet count, prothrombin time (PT), activated partial thromboplastin time (aPTT), and international normalized ratio (INR). Hypocoagulability was defined as ≥ 1 abnormal parameter: PT > 13.5 s, aPTT > 35 s, INR > 1.2, or platelet count <150,000/μL. Multivariable logistic regression identified independent factors associated with hypocoagulability.

Results: The study enrolled 389 HIV-positive adults. Hypocoagulability was detected in 121 participants (31.1%). The most frequent abnormalities were prolonged PT (14.1%), elevated INR (11.8%), prolonged aPTT (11.1%), and thrombocytopenia (9.3%). Independent factors associated with hypocoagulability included older age (aOR: 2.012, 95% CI = 1.165–4.813), alcohol use (aOR: 2.177, 95% CI = 1.250–3.792), ART-naïve status (aOR: 3.159, 95% CI 1.057–9.364), and unsuppressed viral load (aOR: 2.235, 95% CI = 1.297–3.851). Clinically, affected participants more commonly reported easy bruising (33.1%), frequent nose bleeds (29.8%), and heavy menstrual bleeding among women (39.2%) compared to participants without hypocoagulability.

Conclusion: These findings highlight the importance of early detection, promotion of ART adherence, targeted screening of high–risk groups, and integrated management strategies to reduce bleeding–related morbidity in HIV care.

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HIV; hypocoagulability; antiretroviral therapy; platelet count; prothrombin time; aPTT; Uganda

Introduction

The introduction of antiretroviral therapy (ART) in the mid–1990s dramatically reduced HIV–related mortality and transformed HIV infection into a chronic, manageable condition [1]. As survival has improved, people living with HIV increasingly experience non–communicable comorbidities and haematologic complications that are not fully mitigated by antiretroviral therapy (ART) [2]. Among these, hypocoagulability has emerged as an important but under–recognised disorder with clinically relevant consequences [2].

HIV infection is characterised by persistent immune activation and systemic inflammation, contributing to endothelial dysfunction, platelet abnormalities, and dysregulation of coagulation factor synthesis [3,4]. Opportunistic infections, HIV–associated malignancies, and ART–related hepatotoxicity may further disrupt haemostatic balance [5]. These mechanisms can result in a spectrum of coagulation

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abnormalities, including prolonged prothrombin time (PT), activated partial thromboplastin time (aPTT), elevated international normalised ratio (INR), and thrombocytopenia [3,4].

Globally, an estimated 40.8 million people were living with HIV by 2025, with sub–Saharan Africa accounting for nearly two–thirds of cases [6]. Despite this burden, coagulation abnormalities among people with HIV receive limited attention in routine clinical care, particularly in low–resource settings. Studies consistently report higher rates of PT/aPTT prolongation and thrombocytopenia in people with HIV compared with HIV–negative individuals, and these abnormalities are linked to adverse clinical outcomes [7].

In Uganda, approximately 1.5 million people are living with HIV. The Bunyoro sub–region, including Hoima, has prevalence rates above the national average (7.7% in Hoima and 6.1% in Masindi versus a national prevalence of 4.9%) [8]. A study in Mbarara reported a thrombocytopenia prevalence of 17.4% among people with HIV, particularly among ART–naïve individuals and those with advanced disease [9]. However, that study focused mainly on platelet counts and did not assess broader coagulation parameters, leaving the overall burden and clinical manifestations of hypocoagulability insufficiently characterised.

Hypocoagulability is associated with increased morbidity and mortality among people with HIV [3]. When unrecognised, it may lead to clinically significant bleeding complications, including gastrointestinal haemorrhage, hemarthrosis, haemorrhagic stroke, and chronic anaemia [7]. At Hoima Regional Referral Hospital (HRRH), more than 250 HIV–positive patients are seen monthly, yet routine screening for coagulation abnormalities is not standard practice, limiting early detection and intervention.

Given the limited regional evidence and the clinical importance of coagulation abnormalities in HIV infection, this study aimed to determine the prevalence, associated factors, and clinical features of hypocoagulability among people with HIV attending HRRH in Western Uganda.

Methods

Study design and setting

We conducted a hospital–based cross–sectional study at Hoima Regional Referral Hospital (HRRH), a tertiary facility in Hoima City, approximately 228 km from Kampala, Uganda. HRRH serves as the main referral centre for the Bunyoro sub–region, covering Hoima, Masindi, Kibaale, Kiryandongo, Buliisa, Kagadi, Kikuube, and Kakumiro districts. The hospital operates an adult HIV clinic where newly diagnosed and follow–up patients are initiated and maintained on antiretroviral therapy (ART).

Study population and eligibility criteria

The study included adult people with HIV attending the HRRH HIV clinic during the study period (May, June and July 2025). Eligible participants were: (i) confirmed HIV–positive, (ii) aged ≥ 18 years, and (iii) able and willing to provide written informed consent. Both ART–naïve and ART–experienced patients were included.

Participants were excluded if they had known chronic liver disease, pre–existing bleeding disorders, or were receiving anticoagulant therapy, as these conditions independently influence coagulation parameters.

Ethical approval and consent to participate

Ethical approval for this study was obtained from the Kampala International University Research Ethics Committee (Ref: KIU–2025–891). Permission to conduct the study was granted by HRRH administration. Written informed consent was obtained from all participants prior to enrolment. The study was conducted in accordance with the ethical principles of the Declaration of Helsinki.

Sample size determination and sampling technique

The sample size was calculated using a single population proportion formula [10], based on prevalence estimates from a study in Ethiopia reporting prolonged PT (74.5%), prolonged aPTT (36%), elevated INR

(70.5%), and thrombocytopenia (17%) among people with HIV [3]. The most conservative estimate yielded a minimum sample size of 354 participants. To account for non–response, 10% was added, resulting in a final target of 389 participants.

Systematic random sampling was employed. After generating a random starting point from the clinic attendance register, every second eligible patient (sampling interval k = 2) was selected until the required sample size was achieved.

Data collection procedures

Data were collected using structured questionnaires, clinical record review, and laboratory testing. The questionnaire captured socio–demographic characteristics (age, sex, residence, education, and monthly income), behavioural factors (smoking and alcohol intake), and clinical characteristics (HIV duration, ART status and regimen, comorbidities, viral load, and body mass index (BMI). Data on chronic illness was captured by self–report and the most common were hypertension and diabetes. HIV duration was captured as the duration from time of HIV diagnosis to the time of data collection.

Venous blood samples were collected aseptically by trained laboratory personnel at enrolment. A total of 6 mL of blood was drawn from each participant:

- 3 mL in Ethylenediaminetetraacetic acid (EDTA) tubes for platelet and CD4 counts
- 3 mL in 3.2% sodium citrate tubes for coagulation assays

Laboratory analyses were performed using standardised equipment:

- Platelet counts: SYSMEX K–21N haematology analyser
- PT, aPTT, and INR: HUMACLOT DUE PLUS coagulation analyser
- CD4 counts: ABBOTT PIMA point–of–care analyser

Viral load results were extracted from the Uganda Electronic Medical Record (EMR), using the most recent measurement within the preceding 6–12 months, in accordance with national HIV monitoring guidelines.

Hypocoagulability was defined as ≥ 1 abnormal parameter: PT > 13.5 s, aPTT > 35 s, INR > 1.2, or platelet count <150,000/μL [3]. These cut–offs corresponded to the standard laboratory reference ranges used by the Clinical Chemistry and Haematology Laboratory at HRRH.

Study variables

The primary outcome was hypocoagulability, defined by abnormal PT, aPTT, INR, or platelet count. Independent variables included:

- Socio–demographic factors: age, sex, residence, education level, income
- Clinical factors: HIV duration, ART status and duration, ART regimen, CD4 count, viral load, BMI, and chronic illnesses
- Behavioural factors: alcohol intake and cigarette smoking

Data management and analysis

Data were reviewed daily for completeness, entered into Microsoft Excel, cleaned, and exported to SPSS version 26 for analysis.

Descriptive statistics were summarised using frequencies, percentages, means, and standard deviations. Hypocoagulability prevalence was calculated as the proportion of participants with at least one abnormal coagulation parameter, presented with 95% confidence intervals.

Bivariate analyses were performed using chi–square tests and crude odds ratios. Variables with $p < 0.20$ were entered into a multivariable logistic regression model to identify independent associated factors. Adjusted odds ratios (aORs) with 95% confidence intervals were reported, and statistical significance was set at $p < 0.05$.

Clinical features were compared between participants with and without hypocoagulability using the chi–square test.

Validity, reliability, and quality control

The questionnaire underwent expert review by two internal medicine specialists, achieving a content validity index > 0.80. A pilot study involving 10 people with HIV at HRRH was conducted to improve clarity and reliability. Laboratory analyses followed standard operating procedures, and all coagulation assays were performed in duplicate. Daily cheques of completed questionnaires minimised missing data and transcription errors. These measures ensured the reliability of both questionnaire data and laboratory results.

Results

Characteristics of the study participants

A total of 389 participants were enroled in the study. The median age was 43 years with an interquartile range of 36–52 years. The majority were female and aged 30–59 years. Most participants had been living with HIV for more than five years and were receiving ART, while a smaller proportion were ART-naïve. Detailed socio-demographic and clinical characteristics of the study population are presented in Table 1.

Prevalence of hypocoagulability among people with HIV at HRRH

Among the 389 participants, 121 (31.1%) had hypocoagulability, corresponding to a 95% confidence interval of 26.2–35.5%.

The distribution of specific coagulation abnormalities is shown in Table 2. Prolonged PT was the most frequent abnormality, followed by elevated INR and aPTT, while thrombocytopenia was the least common abnormality. Most participants with hypocoagulability exhibited a single abnormal parameter.

Factors associated with hypocoagulability among people with HIV at HRRH

Variables with p-values < 0.20 in bivariable analysis, including age category, alcohol intake, ART status, CD4 count, and viral load were entered in the multivariable logistic regression model (Table 3).

In the multivariable analysis, older age, alcohol intake, ART-naïve status, and unsuppressed viral load remained independently associated with hypocoagulability among people with HIV attending HRRH (Table 4).

Clinical features associated with hypocoagulability among people with HIV at HRRH

Several clinical features were significantly more common among participants with hypocoagulability, including easy bruising, frequent nose bleeds, and heavy menstrual bleeding among women ($p < 0.001$). The proportions of these symptoms were consistently higher in participants with hypocoagulability compared with those without (Table 5).

Discussion

Prevalence of hypocoagulability

In this study, the prevalence of hypocoagulability among people with HIV at HRRH was 31.1%. The prevalence of specific coagulation parameters was prolonged PT (14.1%), elevated INR (11.8%), prolonged aPTT (11.1%), and thrombocytopenia (9.3%). This is comparable to reports from India, where 14.5% of

Table 1. Characteristics of study participants.

Characteristic	Frequency	Percentage
Age (years)		
<30	27	6.9
30–59	313	80.5
60+	49	12.6
Sex		
Female	252	64.8
Male	137	35.2
Residence		
Rural	266	68.4
Urban	123	31.6
Monthly income (Ugx)		
<500,000	329	84.6
≥500,000	60	15.4
Education level		
No formal education	92	23.7
Formal education	297	76.3
Other chronic illness		
No	352	90.5
Yes	37	9.5
Smoking		
No	347	89.2
Yes	42	10.8
Alcohol intake		
No	313	80.5
Yes	76	19.5
HIV duration (years)		
<5	82	21.1
5+	307	78.9
ART status		
On ART	374	96.1
ART Naïve	15	3.9
ART type (*N* = 374)		
TLD (first line)	364	97.3
Other	10	2.7
ART duration		
<5	84	21.6
5+	305	78.4
CD4 count		
>200	317	81.5
<200	72	18.5
Viral load		
Suppressed	301	77.4
Unsuppressed	88	22.6
BMI		
Normal	211	54.2
Under weight	48	12.3
Overweight/Obese	130	33.4

HIV = Human immunodeficiency virus, ART = antiretroviral therapy, TLD = Tenofovir/lamivudine/dolutegravir, CD4 = CD4 + T lymphocytes, BMI = Body mass index, Ugx = Uganda shillings.

Table 2. Distribution of individual coagulation abnormalities among people with HIV at HRRH.

Parameter	Frequency	Percentage (95% CI)
High PT		
No	334	85.9
Yes	55	14.1 (10.8–17.7)
High INR		
No	343	88.2
Yes	46	11.8 (8.5–14.9)
High aPTT		
No	346	88.9
Yes	43	11.1 (8.2–14.4)
Low platelets		
No	353	90.7
Yes	36	9.3 (6.4–12.3)
Number abnormal		
One	75	62.0 (52.9–71.1)
Two	33	27.3 (19.8–36.4)
Three	13	10.7 (5.8–16.5)

PT = Prothrombin Time, INR = International Normalised Ratio, aPTT = activated partial thromboplastin time.

Table 3. Bivariable analysis of factors associated with hypocoagulability among people with HIV at HRRH.

Characteristic	No Hypocoagulability, *N* = 268	Hypocoagulability, *N* = 121	Bivariable analysis		
			cOR	95% CI	*P* value
Age (years)					
<30	23 (8.6)	4 (3.3)	Ref		
30–59	218 (81.3)	95 (78.5)	2.506	0.843–7.444	0.098
60+	27 (10.1)	22 (18.2)	4.685	1.409–15.583	0.012
Sex					
Female	179 (66.8)	73 (60.3)	Ref		
Male	89 (33.2)	48 (39.7)	1.322	0.848–2.062	0.217
Residence					
Rural	187 (69.8)	79 (65.3)	Ref		
Urban	81 (30.2)	42 (34.7)	1.227	0.778–1.937	0.379
Monthly income (Ugx)					
<500,000	226 (84.3)	103 (85.1)	1.063	0.584–1.936	0.841
≥500,000	42 (15.7)	18 (14.9)	Ref		
Education level					
Non formal	52 (19.4)	40 (33.1)	2.051	0.263–3.331	0.204
Formal education	216 (80.6)	81 (66.9)	Ref		
Other chronic illness					
No	241 (89.9)	111 (91.7)	Ref		
Yes	27 (10.1)	10 (8.3)	0.804	0.376–1.719	0.574
Smoking					
No	236 (88.1)	111 (91.7)	Ref		
Yes	32 (11.9)	10 (8.3)	0.664	0.315–1.400	0.282
Alcohol intake					
No	229 (85.4)	84 (69.4)	Ref		
Yes	39 (14.6)	37 (30.6)	2.586	1.546–4.327	<0.001
HIV duration (years)					
<5	56 (20.9)	26 (21.5)	Ref		
5+	212 (79.1)	95 (78.5)	0.965	0.571–1.630	0.895
ART status					
On ART	265 (98.9)	109 (90.1)	Ref		
ART Naïve	3 (1.1)	12 (9.9)	9.725	2.691–35.140	0.001
ART type (*N* = 374)					
TLD (first line)	258 (97.4)	106 (97.2)	Ref		
Other	7 (2.6)	3 (2.8)	1.043	0.265–4.110	0.952
ART duration					
<5	58 (21.6)	26 (21.5)	Ref		
5+	210 (78.4)	95 (78.5)	1.009	0.599–1.701	0.973
CD4 count					
>200	228 (85.1)	89 (73.6)	Ref		
<200	40 (14.9)	32 (26.4)	2.049	1.212–3.466	0.007
Viral load					
Suppressed	226 (84.3)	75 (62.0)	Ref		
Unsuppressed	42 (15.7)	46 (38.0)	3.300	2.016–5.404	<0.001
BMI					
Normal	149 (55.6)	62 (51.2)	Ref		
Under weight	33 (12.3)	15 (12.4)	1.092	0.554–2.153	0.799
Overweight/Obese	86 (32.1)	44 (36.4)	1.230	0.769–1.965	0.388

cOR = Crude odds ratio, CI = Confidence interval, HIV = Human immunodeficiency virus, ART = antiretroviral therapy, TLD = Tenofovir/lamivudine/dolutegravir, CD4 = CD4 + T lymphocytes, BMI = Body mass index, Ugx = Uganda shillings.

ART-experienced patients had prolonged prothrombin time (PT) [4], and an Ethiopian study documenting thrombocytopenia in 9.7% of HIV-positive individuals [5].

The prevalence of thrombocytopenia in our study (9.3%) was lower than the 17.4% reported in Mbarara, Uganda [9], possibly due to a higher proportion of ART-naïve individuals in that cohort. Conversely, a Nigerian study reported a lower prevalence of coagulation abnormalities (6.3%) [11], likely due to assessment of fewer coagulation parameters and a younger study population.

Taken together, these findings indicate a substantial burden of hypocoagulability among people with HIV in western Uganda, particularly in individuals with advanced disease or uncontrolled viral replication.

The observed coagulation abnormalities can be explained by HIV-related pathophysiologic mechanisms. Chronic immune activation and cytokine-mediated endothelial injury disrupt both intrinsic and extrinsic coagulation pathways. Liver dysfunction from HIV infection, ART-related hepatotoxicity, or opportunistic infections may impair clotting factor synthesis, prolonging PT and aPTT. Bone marrow suppression and immune-mediated platelet destruction further contribute to thrombocytopenia. Co-existing risk factors, such as alcohol use, likely amplify these effects [3,4].

Table 4. Multivariable analysis of factors associated with hypocoagulability among people with HIV at HRRH.

	Bivariable analysis			Multivariable analysis		
Characteristic	cOR	95% CI	*P* value	aOR	95% CI	*P* value
Age (years)						
<30	Ref					
30–59	2.506	0.843–7.444	0.098	1.882	0.614–5.762	0.268
60 +	4.685	1.409–15.583	0.012	2.012	1.165–4.813	0.028
Alcohol intake						
No	Ref					
Yes	2.586	1.546–4.327	<0.001	2.177	1.250–3.792	0.006
ART status						
On ART	Ref					
ART Naïve	9.725	2.691–35.140	0.001	3.159	1.057–9.364	0.041
CD4 count						
>200	Ref					
<200	2.049	1.212–3.466	0.007	1.670	0.948–2.942	0.076
Viral load						
Suppressed	Ref					
Unsuppressed	3.300	2.016–5.404	<0.001	2.235	1.297–3.851	0.004

cOR = Crude odds ratio, aOR = adjusted odds ratio, CI = Confidence interval, ART = antiretroviral therapy, CD4 = CD4 + T lymphocytes.

Table 5. Clinical features associated with hypocoagulability among people with HIV at HRRH.

Outcome	Overall	No Hypocoagulability, *N* = 268	Hypocoagulability, *N* = 121	*P* value
Easy bruising				<0.001
No	328 (84.3)	247 (92.2)	81 (66.9)	
Yes	61 (15.7)	21 (7.8)	40 (33.1)	
Excessive bleeding with minor injury				0.781
No	378 (97.2)	260 (97.0)	118 (97.5)	
Yes	11 (2.8)	8 (3.0)	3 (2.5)	
Frequent nose bleeds				<0.001
No	323 (83.0)	238 (88.8)	85 (70.2)	
Yes	66 (17.0)	30 (11.2)	36 (29.8)	
Heavy menstruation (females)				<0.001
No	214 (84.6)	169 (94.4)	45 (60.8)	
Yes	39 (15.4)	10 (5.6)	29 (39.2)	
Blood in urine				0.706
No	381 (97.9)	262 (97.8)	119 (98.3)	
Yes	8 (2.1)	6 (2.2)	2 (1.7)	
Blood in stool				0.943
No	366 (94.1)	252 (94.0)	114 (94.2)	
Yes	23 (5.9)	16 (6.0)	7 (5.8)	
Vomiting blood				0.866
No	377 (96.9)	260 (97.0)	117 (96.7)	
Yes	12 (3.1)	8 (3.0)	4(3.3)	
Joint pains				0.526
No	269 (69.2)	188 (70.1)	81(66.9)	
Yes	120 (30.8)	80 (29.9)	40 (33.1)	
Frequent headache				0.640
No	174 (44.7)	122 (45.5)	52 (43.0)	
Yes	215 (55.3)	146 (54.5)	69 (57.0)	
Impaired hearing				0.265
No	298 (76.6)	201 (75.0)	97 (80.2)	
Yes	91 (23.4)	67 (25.0)	24 (19.8)	
Seizures				0.734
No	354 (91.0)	243 (90.7)	111 (91.7)	
Yes	35 (9.0)	25 (9.3)	10 (8.3)	

Factors associated with hypocoagulability

Older age was independently associated with hypocoagulability, consistent with findings from India and Ghana, where adults over 50 years had increased odds of abnormal PT and aPTT [12,13]. Age-related chronic inflammation ('inflammaging'), compounded by HIV-associated immune activation, may accelerate endothelial dysfunction and haemostatic abnormalities [14].

Alcohol intake was also independently associated with hypocoagulability. Similar associations have been reported in Nigeria, where chronic alcohol use correlated with reduced platelet counts and prolonged clotting times [15]. Alcohol increases intestinal permeability, facilitating microbial translocation and systemic immune activation, which may further impair coagulation pathways [16].

ART status significantly influenced coagulation outcomes. ART-naïve individuals had more than three-fold higher odds of hypocoagulability, consistent with studies from Ethiopia, India, and Ghana [3,4,13]. ART improves platelet counts, reduces systemic inflammation, and promotes hepatic recovery, which may explain the protective effect observed in our cohort [17].

Unsuppressed viral load was strongly associated with hypocoagulability. Prior studies from Ethiopia and Nigeria similarly reported prolonged PT and thrombocytopenia among individuals with high viremia [3,18]. Persistent HIV replication contributes to bone marrow suppression and immune dysregulation, impairing both primary and secondary haemostasis [19].

These findings reinforce the importance of maintaining viral suppression, promoting immune recovery, and addressing modifiable risk factors to reduce HIV-associated hypocoagulability.

Clinical features associated with hypocoagulability

Easy bruising, frequent nose bleeds, and heavy menstrual bleeding were the most common bleeding features. Easy bruising occurred in approximately one-third of affected participants, consistent with Canadian data where bruising and petechiae predominated among individuals with HIV-associated immune thrombocytopenia [20].

Frequent nose bleeds were reported by 29.8% of participants, aligning with Nigerian studies identifying nose bleeds as a frequent otolaryngologic manifestation of HIV infection [21]. Ambler et al. also highlighted nose bleeding as a common presentation in HIV-associated immune thrombocytopenia [20].

Heavy menstrual bleeding was significantly more frequent among women with hypocoagulability, consistent with reports from Nigeria and China describing increased menorrhagia in HIV-positive women [22,23]. These findings underscore the gender-specific clinical impact of hypocoagulability, with implications for anaemia, reproductive health, and quality of life.

Recommendations

- Integrate routine coagulation screening, including PT, aPTT, INR and platelet count into HIV care, particularly for high-risk groups such as ART-naïve individuals, older adults, patients with unsuppressed viral load, and those who consume alcohol.
- Strengthen ART initiation and adherence programmes to improve viral suppression and reduce inflammation-related coagulation abnormalities.
- Enhance clinician awareness of bleeding manifestations, including easy bruising, frequent nose bleeds, and heavy menstrual bleeding, as potential early indicators of hypocoagulability among people with HIV.
- Implement targeted health education addressing modifiable risk factors, particularly alcohol use, which appears to contribute significantly to coagulation abnormalities.

Strengths and limitations

A major strength of this study is that it is the first Ugandan hospital-based study to comprehensively assess multiple coagulation parameters (PT, aPTT, INR, and platelet count) among both ART-naïve and ART-experienced people with HIV.

However, the hospital-based, single-centre design may limit generalisability to the wider HIV-positive population. The analyses were cross-sectional so could only look at associations. Liver function tests and mixing studies were not performed, which could have provided further insight into the mechanisms underlying prolonged clotting times. The severity of hypocoagulability and the specific types of chronic illnesses (comorbidities) were not systematically captured during data collection, which limited further analysis of these variables. In addition, alcohol intake was assessed using a binary self-report rather than validated screening tools, which may have introduced misclassification bias. Similarly, smoking was assessed using a binary self-report, which could have misclassified ex-smokers as non-smokers. There may also be varying degrees of liver dysfunction within this cohort, given the uncertain patterns of alcohol

consumption, which could affect coagulation factor production. Finally, the effect of menopausal/peri-menopausal status and its influence via hormones/oestrogen was not assessed.

Conclusion

Hypocoagulability is a common complication among people with HIV at Hoima Regional Referral Hospital, affecting nearly one-third of participants. Older age, alcohol use, ART-naïve status, and unsuppressed viral load were independently associated with hypocoagulability. The most prominent clinical features included easy bruising, frequent nose bleeds, and heavy menstrual bleeding.

These findings highlight the importance of early detection, promotion of ART adherence, targeted screening of high-risk groups, and integrated management strategies to reduce bleeding-related morbidity in HIV care.

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Author contributions

CRediT: **Abdisalam Ahmed Sandeyl:** Conceptualization, Investigation, Methodology, Project administration, Resources, Writing – original draft, Writing – review & editing; **Mohamed Jayte:** Conceptualization, Writing – original draft, Writing – review & editing; **Farah Dubad Abdi:** Investigation, Methodology; **Hassan Omar Ali:** Data curation, Investigation; **Abdisamad Guled Hersi:** Investigation, Resources; **Zakarie Abdullahi Hussein:** Conceptualization, Investigation; **Venance Emmanuel Mswelo:** Formal analysis, Methodology; **Abdalla Ahmed Deifa:** Supervision, Writing – review & editing; **Abishir Mohamud Hirsi:** Supervision, Writing – review & editing; **Jacinto Amandua:** Supervision, Writing – review & editing.

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Data availability statement

The data that support the findings of this study contain sensitive participant information and are not publicly available. De-identified data are available from the corresponding author upon reasonable request, subject to approval by the Kampala International University Research Ethics Committee.

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