

The prevalence of HIV among hospitalized persons with acute febrile NS HOPKINS INFECTIOUS DISEASES INSTITUTE illness in rural Uganda, August 2019 to August 2020 Paul W. Blair^{1,2}; Kenneth Kobba³; Matthew L. Robinson¹; Emmanuel Candia³; Gilbert Aniku⁴; Alphonsus Matovu⁵; Francis Kakooza³; Richard Walwema³; Mohammed Lamorde³; Yukari C. Manabe¹

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Background

In Uganda, in the early PEPFAR era, HIV coinfections were responsible for most hospitalizations with febrile illness (as high as 85% in 2006). Currently, national guidelines recommend universal antiretroviral therapy ideally before the development of AIDS. We evaluated the prevalence of HIV among patients admitted to two regional referral hospitals with febrile illness in the era of 'Treat All.'

Methods

Participants were admitted to two regional referral hospitals in Uganda were enrolled at emergency departments or medical wards in a prospective acute febrile illness cohort. Participants were followed during hospitalization and 3-8 weeks after enrollment. Participants uniformly received blood cultures, malaria (rapid diagnostic test), and tuberculosis (Xpert MTB/RIF Ultra), hepatitis A IgM, hepatitis B sAg, and HIV fourth generation testing were performed as part of the study. A malaria smear was considered clinically significant if there were ≥500 parasites/microliter. Among participants with HIV, CD4 counts, cryptococcal antigen testing and urine lipoarabinomannan (LAM) were performed for all participants.

We calculated summary statistics of baseline demographics, physiologic parameters, quick sequential organ failure assessment (qSOFA) scores, and subsequent diagnoses made by the research physicians on-site. We stratified these descriptive statistics between those living with HIV and newly diagnosed with HIV those that were HIV-negative. Additionally, we created a Kaplan-Meier curve of survival stratified by HIV status.

Results

Characteristic	Total (N=128)	HIV+	(N=45)	HIV- (N=83)		
Age- mean (SD)	35.9	35.9 (14.3)		40.3 (13.3)		33.5 (14.3)	
Female sex - no. (%)	74 (60)		27 (60)		37.0 (56.6)		
Comorbid conditions	Ν	%	Ν	%	Ν	%	
None	87	68.0	32	91.1	71	85.5	
Hypertension	5	3.9	2	4.4	3	3.6	
Diabetes	5	3.9	2	4.4	3	3.6	
Other	3	2.3	0	0	2	2.4	
Sickle cell/thalassemia	3	2.3	0	0	3	3.6	
Emphysema or asthma	1	0.8	0	0	1	1.2	

Table 1. Baseline demographics and comorbidities

SD: standard deviation

Physiologic parameter	Total (N=128)		HIV+ (N=45)		HIV- (N=83)	
	Mean	SD	Mean	SD	Mean	SD
Systolic blood pressure (mmHg)	111.2	21.3	115.3	21.5	109.1	21.0
Diastolic blood pressure (mmHg)	68.4	16.8	71.5	15.6	66.8	17.3
Temperature (degrees Celsius)	38.3	0.9	38.2	0.9	38.3	0.9
Heart rate (beats per minute) Bospiratory rate	106.7	21.2	105.8	21.1	107.2	21.4
(breaths per minute)	22.2	6.3	21.8	6.3	22.4	6.4
Oxygen saturation (%)	96.4	4.3	96.6	3.8	96.3	4.6
Glasgow coma scale	14.7	1.5	14.42	2.2	14.8	1.0
qSOFA score	Ν	%	Ν	%	Ν	%
3	3	2.4	0	0.0	3	3.7
2	21	16.7	7	15.9	14	17.1
1	55	43.7	22	50.0	33	40.2
0	47	37.3	15	35.1	32	39.0

Table 2. Baseline physiologic parameters and qSOFA scores



Figure 1. Bar plot of clinical diagnoses as a percent of the total cohort stratified by HIV status.

Results





Figure 3. Kaplan-Meier survival curve stratified by HIV status.



Results

- From August 2019-August 2020, 128 participants (60% female) with an average age of 35.9 (SD 14.3) years, presented from 10 districts in Uganda. Participants presented at facilities 4.7 days (SD: 2.4) after onset of symptoms. Additionally, 19.0% of participants had a qSOFA (quick Sepsis Related Organ Failure Assessment) severity score of 2 or greater (Table 2). The most common diagnoses included malaria, urinary tract infections and sepsis of an unknown origin (Figure 1).
- On admission, 23.4% (n=30) of participants had a self-reported known history of HIV, the majority (66.7%) were on ART on hospital presentation. Overall there were 45 (35.1%) patients with a known or new history of HIV. The median CD4 count was 235 (interguartile range: 98, 423) in the setting of acute illness.
- Of the 11.1% (n=11) of the cohort who were newly diagnosed with HIV during the admission, 6 were started on ART during hospitalization or within a month after hospitalization.
- Microbiologic and rapid diagnostic test results included positive results for malaria (smear: 18.9%, 24/127; RDT: 29.7%, 38/128), hepatitis A (0.8%, 1/128), and hepatitis B (3.9%, 5/128). Blood cultures were positive in 9.3% of patients (10/107) with *S. pneumoniae* being most common isolate (N=4). Testing limited to patients with HIV included tuberculosis (25.9%, 2/11 PCR; 7/17 urine LAM), and cryptococcal antigen positive (16.7%; 4/24) (Figure 2).
- At follow-up (3 to 8 weeks from enrollment), 18.3% (n=13) died and 10.0% were lost to follow-up. Five out of nine patients who died had HIV (Figure 3).

Conclusions

- In the universal ART era, the proportion of hospitalized febrile patients with HIV has decreased.
- Overall, 11% have newly diagnosed infection emphasizing the importance of continuing to test all hospitalized febrile patients.
- Diagnostic evaluations are needed to assess the burden of other causes of febrile illness in order to reprioritize potential differential diagnoses.

Acknowledgments

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