Hepatitis B treatment in Africa: Experiences from a scale-up program in Ethiopia

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Introduction

- In sub-Saharan Africa treatment for chronic hepatitis B (CHB) is rarely available.
- The World Health Organization (WHO) recently published new treatment guidelines which can make treatment more available (1). Still, data on the management of CHB is scarce in the African region, and data from real-life programs are needed to inform policy (2).
- To address this, in 2021/22 we established a scale-up CHB treatment program at four regional hospitals in Ethiopia.

Aim

- To present early experiences from a large public-sector scale-up CHB treatment program in Ethiopia.

Method

- HIV-negative adults with CHB were enrolled between December 2021 and December 2023 at regional hospitals in four cities in Ethiopia; Adama, Dubti, Jigjiga and Jimma.
- The patients were assessed with laboratory tests, including viral markers and liver enzymes. Tenofovir disoproxil fumarate was provided free of charge to those who met the eligibility criteria (Table 1).
- Logistic regression models were used to study the associations between baseline variables and presence of advanced chronic liver disease (CLD).

Table 1: Treatment eligibility criteria

	Treatment criteria
I	Clinically diagnosed cirrhosis
II	APRI ≥ 0.7
III	ALT > 40 U/L and HBV DNA > 2000 IU/mL
IV	HCC in first-degree relative and HBV DNA > 2000 IU/mL

Results

- A total of 6023 patients were included (Table 2).
- Most patients had normal (≤ 40 U/L) alanine aminotransferase (ALT) (n = 4427, 73.9%) and low (≤ 0.5) aspartate aminotransferase to platelets ratio index (APRI) (n = 4516, 75.4%).
- 2969 (49.3%) patients were classified as inactive carriers, defined by HBV DNA < 2000 IU/ml, ALT ≤ 40 U/L and APRI < 0.7.
- 1035 (17.2%) patients had APRI ≥ 0.7, suggestive of advanced CLD. 77.0% of patients with advanced CLD were male (Figure 1).
- Male sex (adjusted odds ratio (AOR) 3.24; 95% CI 2.75-3.83), HBV DNA ≥ 2000 IU/ml (AOR 3.21; 95% CI 2.78-3.71), BMI < 19.0 kg/m^2 (first tertile) (AOR 1.88; 95% CI 1.56-2.27) and BMI 19.0-22.1 kg/m^2 (second tertile) (AOR 1.61; 95% CI 1.33-1.95) were independently associated with advanced CLD (Table 3).
- Figure 2 illustrates APRI as a function of gender, BMI and HBV DNA.
- In total, 1681 (27.9%) patients were eligible for treatment at baseline evaluation.

Table 2: Baseline characteristics of study participants

Characteristics	Number (%)
Gender	
Female	2956 (49.1)
Male	3067 (50.9)
Age (years), median (IQR)	30 (25-38)
18-25	1955 (32.5)
26-35	2274 (37.8)
> 35	1794 (29.8)
BMI (kg/m^2) (n = 6013), median (IQR)	20.4 (18.2-23.3)
Substance abuse	
Alcohol	109 (1.8)
Khat	882 (14.6)
HCV co-infection (n =5965)	29 (0.5)
ALT (U/L) (n = 5991), median (IQR)	26 (17-42)
≤ 40	4427 (73.9)
> 40	1564 (26.1)
HBV DNA (IU/ml) (n = 5941), median (IQR)	587 (68-5050)
< 2000	3914 (65.9)
≥ 2000	2027 (34.1)
APRI (n = 5986), median (IQR)	0.28 (0.19-0.49)
≤ 0.50	4516 (75.4)
> 0.50	1470 (24.6)

Table 3: Baseline variables associated with advanced chronic liver disease (ARPI ≥ 0.7)

Variable[a]	APRI < 0.7 (%)	APRI ≥ 0.7 (%)	Crude		Adjusted	
			OR (95% CI)	*P*	OR (95% CI)	*P*
Gender						
Female	2700 (54.5)	238 (23.0)	1		1	
Male	2251 (45.5)	797 (77.0)	4.02 (3.44-4.70)	< 0.001	3.24 (2.75-3.83)	< 0.001
Age (years)						
18-25	1608 (32.5)	332 (32.1)	1		-	
26-35	1893 (38.2)	370 (35.7)	0.95 (0.80-1.11)	0.508	-	-
> 35	1450 (29.3)	333 (32.2)	1.11 (0.94-1.32)	0.214	-	-
BMI (kg/m^2)[b]						
> 22.1 (T3)	1761 (35.6)	214 (20.7)	1		1	
19.0-22.1 (T2)	1640 (33.2)	374 (36.1)	1.88 (1.57-2.25)	< 0.001	1.61 (1.33-1.95)	< 0.001
< 19.0 (T1)	1541 (31.2)	447 (43.2)	2.39 (2.00-2.85)	< 0.001	1.88 (1.56-2.27)	< 0.001
Alcohol abuse						
No	4874 (98.4)	1004 (97.0)	1		1	
Yes	77 (1.6)	31 (3.0)	1.95 (1.26-2.95)	0.002	1.19 (0.74-1.87)	0.455
Khat abuse						
No	4298 (86.9)	808 (78.1)	1		1	
Yes	649 (13.1)	227 (21.9)	1.86 (1.57-2.20)	< 0.001	1.16 (0.96-1.40)	0.113
HBV DNA (IU/ml)						
< 2000	3489 (71.2)	409 (40.6)	1		1	
≥ 2000	1410 (28.8)	599 (59.4)	3.64 (3.17-4.19)	< 0.001	3.21 (2.78-3.71)	< 0.001

[a]ALT was not included as a variable because of the close correlation with AST and thereby APRI.
[b]BMI divided in groups by tertiles (T1-T3).

Figure 1: Inactive carriers (HBV DNA < 2000 IU/ml, ALT ≤ 40 U/L and APRI < 0.7), patients with advanced chronic liver disease (CLD) (APRI ≥ 0.7) and neither of the mentioned, stratified by gender and age group

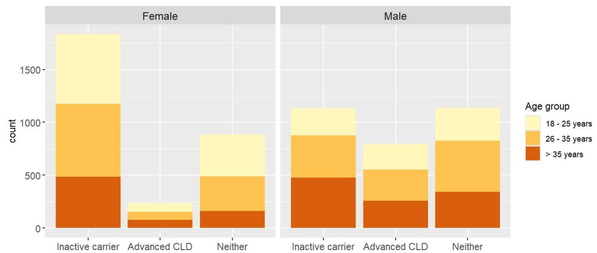
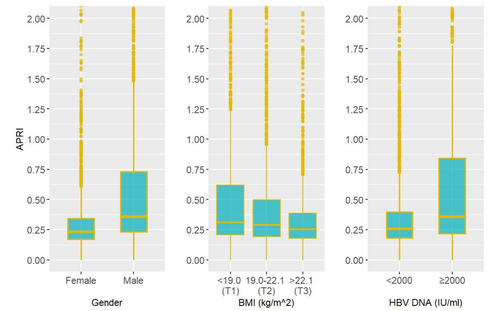


Figure 2: ARPI as a function of gender, BMI and HBV DNA



Conclusions

- Roughly 25% were eligible for treatment, highlighting the importance of improved access to CHB treatment in sub-Saharan Africa.
- Another 25% were indeterminate and would need longitudinal follow-up to determine treatment eligibility.
- The remaining 50% were classified as inactive carriers and could probably have less intensive follow-up.

References

1. Guidelines for the prevention, diagnosis, care and treatment for people with chronic hepatitis B infection. *Geneva: World Health Organization; 2024. Licence: CC BY-NC-SA 3.0 IGO.*
2. Riches N et al. Hepatitis B in Africa Collaborative Network: cohort profile and analysis of baseline data. *Epidemiol Infect. 2023;151:e65.*

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