

Prevalence of Low Lean Mass in People Living with HIV on Antiretroviral Therapy

Background

Low lean mass (LLM) may affect physical function and is associated with adverse events.

Objectives

We assessed the prevalence of LLM in people living with HIV (PLWH) on antiretroviral therapy, the associated factors, and the influence of using different definitions.

Methods

✓ Cross-sectional study of consecutive PLWH included after a whole-body dual X-ray absorptiometry (DXA) scan.

✓ LLM was defined based on the following criteria and cut-offs:

- 1) Appendicular lean mass index (ALMI) criteria according to the European Working Group on Sarcopenia in Older People (EWGSOP) cut-off (<7.26 kg/m² in males; <5.5 kg/m² in females) [1];
- 2) ALMI criteria according to the National Health and Nutrition Examination Survey (NHANES) cut-off (<6.19 kg/m² in males and <4.73 kg/m² in females) [1];
- 3) ALMI/body mass index criteria (ALMI/BMI, <0.9 kg/m² m in males and <0.63 kg/m² in females) [2].

✓ The association between ALMI and other variables was analyzed using Spearman's correlation coefficients.

Results

- We included 607 PLWH, with a mean age of 44.6 (20-80) years, 28% were females (Table 1).
- The highest values of ALMI were observed in the fourth decade (Figure 1).
- Applying the European criteria, 46% of males and 32% of females presented LLM.
- The prevalence of LLM varied considerably according to the cut-off and criteria applied (Table 2).
- Nevertheless, the prevalence of LLM using European criteria was high in all age strata (Figure 2).

Table 1. Characteristics of the population

	Total (n=607)
Age in years, mean (range)	44.6 (20-80)
Gender, n (%)	
Female	170 (28)
Male	437 (72)
Body mass index [kg/m ²], median (IQR)	24.1 (15.5-43.3)
Appendicular lean mass index [Kg/m ²], median (IQR)	6.96 (3.8-11.2)
Females	5.8 (3.8-8.5)
Males	7.4 (4.7-11.2)
Fat mass ratio (FMR), median (IQR)	1.2 (0.4-2.6)
Females	1.0 (0.4-2.2)
Males	1.2 (0.6- 2.6)
Lipodystrophy, n (%)	
Females (FMR > 1.33)	103 (17)
Males (FMR > 1.96)	24 (4)
Risk factor fo HIV infection, n (%)	
Intravenous drug user	224 (37)
Men who have sex with men	212 (35)
Heterosexual sex	164 (27)
Hepatitis C co-infection, n (%)	159 (26)
Hepatitis B co-infection, n (%)	24 (4)
Nadir CD4+ cell count [cells/mm ³], median (IQR)	215 (92-318)
Nadir CD4+ cell count <200 cells/mm ³ , n (%)	279 (46)
CD4+ cell count at inclusion [cells/mm ³], median (IQR)	542 (382-718)
RNA-HIV at inclusion <50 copies/ml, n (%)	546 (90)
Duration of HIV infection [years], median (IQR)	15.7 (7.6- 20.8)
Duration of cART [years], median (IQR)	12.5 (3.8- 15.9)

FMR, % trunk fat mass/% limbs fat mass; IQR, interquartile range; cART, combined antiretroviral therapy.

Results

Figure 1. Appendicular lean mass index by age

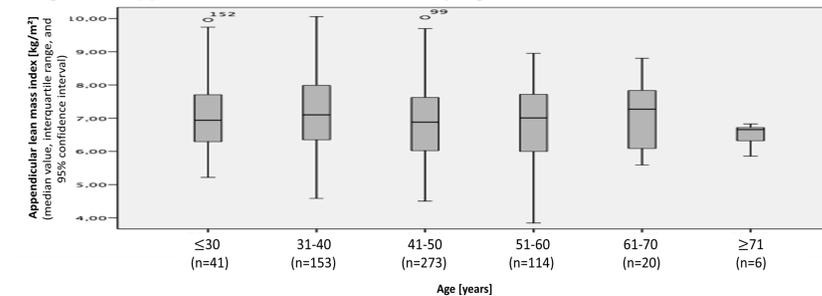
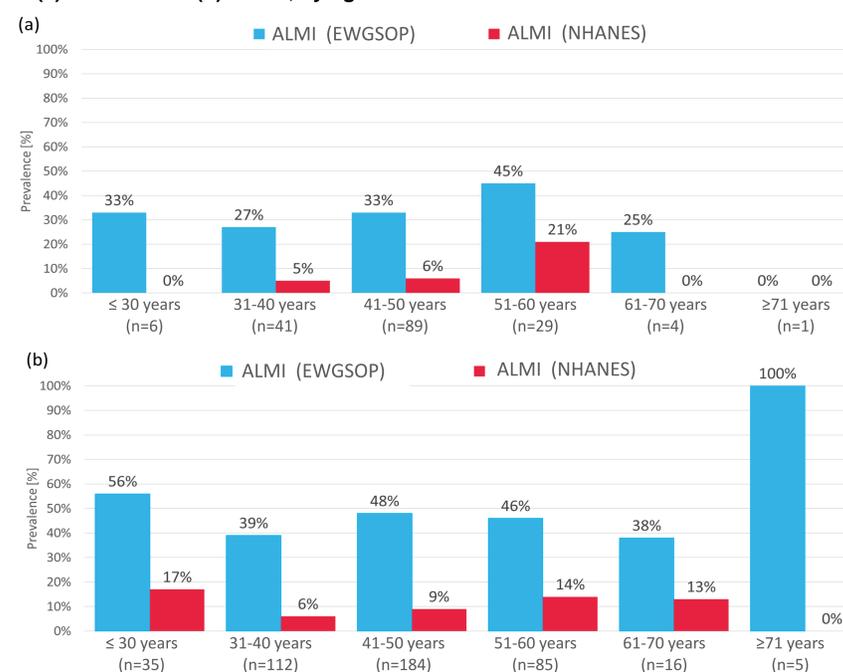


Table 2. Low lean mass prevalence according to different criteria

	ALMI (EWGSOP criteria)	ALMI (NHANES criteria)	ALMI/BMI criteria
Total (n=607)	42%	10%	44%
Females (n=170)	32%	8%	43%
Males (n=437)	46%	10%	44%

ALMI, appendicular lean mass index; ALMI/BMI, appendicular lean mass index/body mass index.

Figure 2. Prevalence of low lean mass according to EWGSOP or NHANES criteria in (a) females and (b) males, by age



Conclusions

Low lean mass was highly prevalent in PLWH under antiretroviral therapy in all age groups. The prevalence of low lean mass and the relationship between lean mass and body fat differed considerably according to the criteria and cut-offs applied.

- In both genders, the ALMI was negatively and weakly correlated with age, and positively correlated with BMI, total fat mass, and trunk and limbs fat.
- In males, this index was positively correlated with CD4+ cell counts at inclusion and its improvement from nadir.
- There was no correlation between ALMI and the duration of HIV infection or antiretroviral treatment.

Table 3. Correlations of appendicular lean mass index by gender

	Rho	P-value
Appendicular lean mass index		
Age		
Females	-0.16	0.04
Males	-0.12	0.01
Body mass index		
Females	0.46	<0.01
Males	0.22	<0.01
Total fat mass		
Females	0.32	<0.01
Males	0.57	<0.01

Figure 3. Correlations between the appendicular lean mass index in both genders and anthropometric measures

