HIV NASH CRN

HIV NASH Clinical Research Network (HIV NASH CRN) is sponsored by the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK).

Simple Adiposity Measures Identify MASLD in People with HIV: Results from a US Multicenter Cohort

0599

Kara Wegermann[1], Laura Wilson[2], Eduardo Vilar Gomez[3], Holly Crandall[3], Jennifer Price[4], Richard K. Sterling[5], Sonya Heath[6], Mark Sulkowski[7], Rohit Loomba[8], Susanna Naggie[1], Naga Chalasani[3], Jordan E. Lake[9]

1. Duke University, 2. Johns Hopkins Bloomberg School of Public Health, 3. Indiana University, 4. University of California San Francisco, 5. Virginia Commonwealth University, 6. University of Alabama Birmingham, 7. Johns Hopkins University, 8. University of California San Diego, 9. UTHealth Houston

BACKGROUND

- About 40% of people with HIV (PWH) have metabolic dysfunction-associated steatotic liver disease (MASLD)[1]
- IDSA recommends screening PWH with elevated liver enzymes → may miss affected PWH[2]
- Need: simple tools for risk stratification in clinic
- BMI limitations:
  - Poor differentiation of adiposity from lean mass
  - Variable performance by race
- **Aim:** evaluate whether adiposity indices (measurements of body fat distribution) are associated with MASLD in PWH and whether performance varies by race or ethnicity.

METHODS

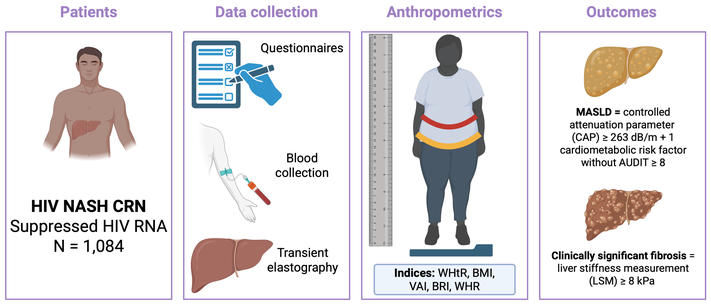


Table 1: Adiposity indices

Index	Components	Formula
Waist-to-Height Ratio (WHtR)	Waist circumference Height	WC/Ht
Waist-to-Hip Ratio (WHR)	Waist circumference Hip circumference	WC/HC
Body Roundness Index (BRI)	Waist circumference Height	$364.2 - 365.5 \times \sqrt{(1 - [\text{waist circumference in centimeters} / 2\pi]^2 / [0.5 \times \text{height in centimeters}]^2)}$
Relative Fat Mass (RFM)	Waist circumference Height	Men: 64 – 20 × (height / waist circumference) Women: 76 – 20 × (height / waist circumference)
Visceral Adiposity Index (VAI)	Waist circumference BMI Triglycerides HDL	Men: [WC/(39.68 + (1.88 × BMI))] × (TG/1.03) × (1.31/HDL-c) Women: [WC/(36.58 + (1.89 × BMI))] × (TG/0.81) × (1.52/HDL-c)

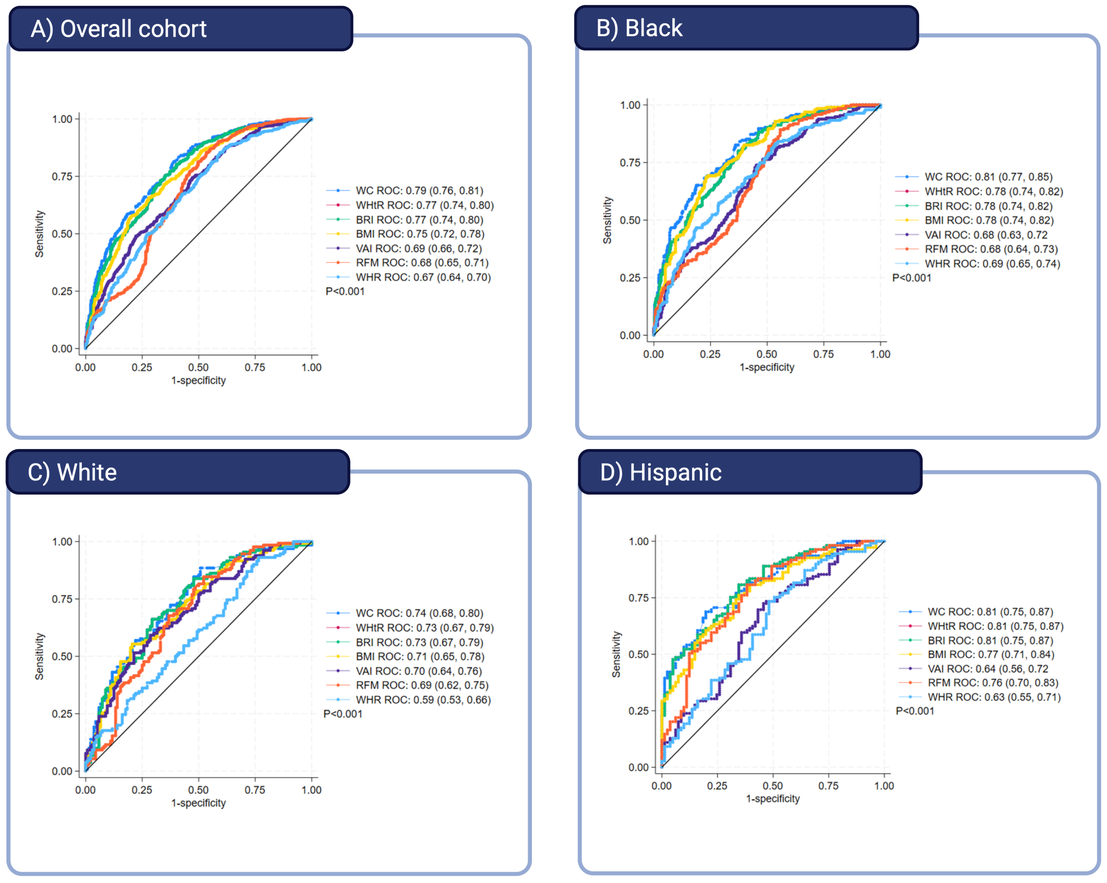
Table 2: Participant demographics

	No MASLD (N=545)	MASLD (N=445)	Total (N=990)	P
Demographics, mean (SD) or N (%)				
Age, years	52.8 (12.8)	54.4 (11.1)	53.5 (12.1)	0.04
Sex – male	393 (72%)	328 (74%)	721 (73%)	0.57
Race/Ethnicity				<0.001
Non-Hispanic White	136 (25%)	130 (29%)	266 (27%)	
Hispanic, non-Black	81 (15%)	109 (24%)	190 (19%)	
Black	314 (58%)	195 (44%)	509 (51%)	
Other	13 (2%)	11 (2%)	24 (2%)	
Comorbidities, N (%)				
Type 2 Diabetes	86 (16%)	145 (33%)	231 (23%)	<0.001
Hyperlipidemia	270 (50%)	286 (64%)	556 (56%)	<0.001
Hypertension	380 (70%)	350 (79%)	730 (74%)	0.001
Adiposity Indices, median (IQR)				
BMI, kg/m^2	26.9 (23.6, 30.3)	31.9 (28.2, 36.6)	29.0 (25.5, 33.5)	<0.001
Relative Fat Mass (RFM)	27.9 (24.0, 35.4)	32.4 (28.9, 40.1)	30.3 (26.0, 37.7)	<0.001
Waist to Height Ratio (WHtR)	0.5 (0.5, 0.6)	0.6 (0.6, 0.7)	0.6 (0.5, 0.6)	<0.001
Body Roundness Index (BRI)	4.0 (3.3, 5.3)	5.7 (4.7, 7.5)	4.8 (3.6, 6.3)	<0.001
Visceral Adiposity Index (VAI)	1.2 (0.8, 2.0)	2.0 (1.3, 3.2)	1.6 (0.9, 2.6)	<0.001
Waist-to-Hip Ratio	0.94 (0.89, 0.98)	0.97 (0.94, 1.04)	0.96 (0.91, 1.01)	<0.001
Waist circumference (cm)	92.2 (85.0, 101.0)	105.7 (97.0, 117.7)	98.0 (90.0, 109.0)	<0.001

Simple, inexpensive adiposity indices accurately identify MASLD in PWH.

RESULTS

Figure 1:Adiposity indices overall and by race



WC = waist circumference, WHtR = Waist-to-height ratio, BRI = body roundness index, BMI = body mass index, VAI = visceral adiposity index, RFM = relative fat mass, WHR = waist-to-hip ratio

CONCLUSIONS

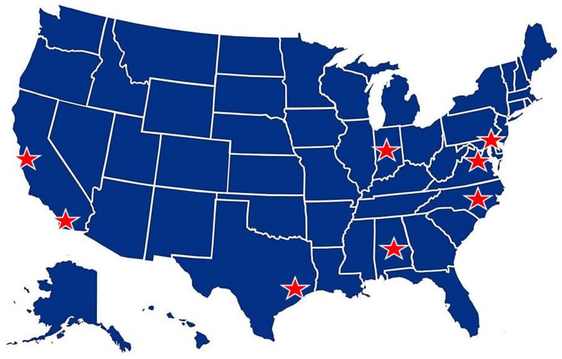
- Adiposity indices were strongly associated with MASLD
- Discriminatory ability varied by race and ethnicity
- WC overall performed the best for discriminating MASLD
- WC outperformed BMI in White and Black PWH, while several measures performed similarly in Hispanic PWH.
- Simple anthropometric indices may provide practical tools for MASLD risk assessment and could be tailored by race and ethnicity.

ADDITIONAL KEY INFORMATION

- Study contact information:
  - Kara Wegermann (kara.Wegermann@duke.edu)
  - Holly Crandall, Project Manager (hrking1@iu.edu)
- References

1. Gawrieh S, Vilar-Gomez E, Woreta TA, Lake JE, Wilson LA, Price JC, Naggie S, Sterling RK, Heath S, Corey KE, Cachay ER, Ajmera V, Tonascia J, Sulkowski MS, Chalasani N, Loomba R. Prevalence of steatotic liver disease, MASLD, MetALD and significant fibrosis in people with HIV in the United States. Aliment Pharmacol Ther. 2024 Mar;59(5):666-679. doi: 10.1111/apt.17849. Epub 2023 Dec 29. PMID: 38158589; PMCID: PMC10922859.
2. Lake JE, Taron J, Ribaudo HJ, Leon-Cruz J, Utay NS, Swaminathan S, Fitch KV, Kileel EM, Paradis K, Fulda ES, Ho KS, Luetkemeyer AF, Johnston CD, Zanni MV, Douglas PS, Grinspoon SK, Lu MT, Fichtenbaum CJ; REPRIEVE Trial Investigators. Hepatic steatosis and nonalcoholic fatty liver disease are common and associated with cardiometabolic risk in a primary prevention cohort of people with HIV. AIDS. 2023 Nov 15;37(14):2149-2159.

Figure 2: HIV NASH CRN sites



PLAIN LANGUAGE SUMMARY

Measures of where fat is stored in the body accurately identify MASLD in people with HIV.