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Association of HIV Reservoir with Subclinical Myocardial Dysfunction in People with HIV

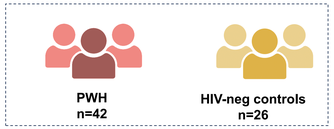
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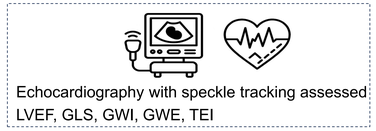
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BACKGROUND

- People living with HIV remain at higher risk of heart disease even when the virus is well controlled with treatment.
- Using advanced heart imaging, we detected early changes in heart function that are not seen on routine tests.
- We aimed to assess early myocardial dysfunction in PWH and its relationship with the HIV reservoir suggesting that ongoing viral persistence may contribute to silent, early heart damage..

METHODS





- Assessed left ventricular ejection fraction (LVEF), global longitudinal strain (GLS), global work index (GWI), global work efficiency (GWE), and TEI index (combined systolic and diastolic function).



- Reservoir size and proviral composition were measured by ddPCR and IPDA. Associations were analyzed with STATA adjusting for age, sex, and cardiovascular risks.

RESULTS

	PWH	HIV-neg controls	p-value
Sex (men, %)	33 (80.5%)	19 (70.4%)	1.000
Age (years), median [IQR]	54.0 [45.0–60.0]	57.0 [47.5–62.5]	0.304
BMI (kg/m²), median [IQR]	26.2 [23.9–29.6]	28.1 [25.6–31.4]	0.075
Hypertension, n (%)	14 (34.1%)	10 (50.0%)	0.234
Diabetes, n (%)	1 (2.4%)	2 (10.0%)	0.248
Dyslipemia, n (%)	20 (48.8%)	9 (45.0%)	0.781
Smoking, n (%)	26 (63.4%)	8 (40.0%)	0.084
CD4/CD8 ratio, median [IQR]	1.1 [0.8–1.5]	1.0 [1.0–1.0]	0.680
PI exposure, n (%)	23 (57.5%)	-	-
AZT exposure, n (%)	16 (40.0%)	-	-
DDI exposure, n (%)	12 (30.0%)	-	-
d4T exposure, n (%)	11 (27.5%)	-	-
TDF exposure, n (%)	33 (82.5%)	-	-
ABC exposure, n (%)	25 (62.5%)	-	-

Table 1. *Demographic characteristics of participants. BMI: Body Mass Index; PI: protease inhibitors; AZT: zidovudine; DDI: didanosine; d4T: stavudine; TDF: tenofovir disoproxil fumarate; ABC: abacavir.*

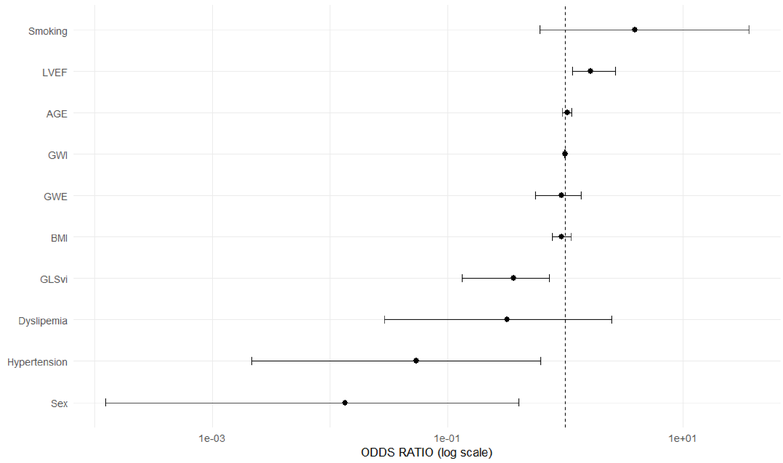


Figure 1. Multivariable logistic regression model for HIV infection adjusted by risk factors. Lower GLSvi values were linked to HIV infection, higher LVEF values were associated with HIV. GWI, GWE, and conventional cardiovascular risk factors were not independently associated in the adjusted model.

HIV reservoir size independently predicts impaired myocardial efficiency and subclinical cardiac dysfunction

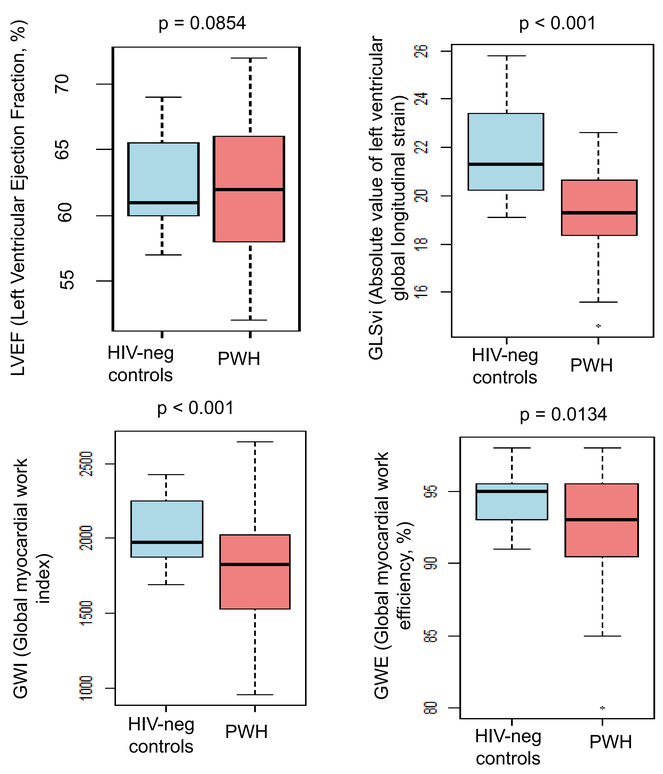


Figure 3. PWH showed significant alterations compared with controls, with lower GLSvi (β = −2.34; p < 0.001), GWI (β = −278; p = 0.001), and GWE (β = −1.90; p = 0.013). No differences in LVEF were observed between groups.

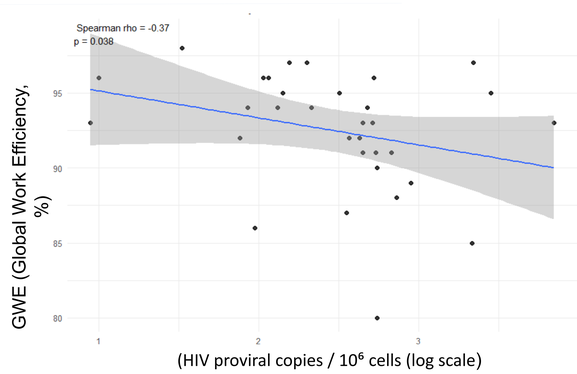


Figure 2. Viral reservoir size inversely correlated with global myocardial efficiency (rho = −0.37; p = 0.038).

CONCLUSIONS

- This study identifies HIV reservoir size as an independent determinant of myocardial work inefficiency, supporting a role for persistent viral reservoirs in early, subclinical cardiac dysfunction.
- Conventional cardiac tests may fail to capture this risk in people living with HIV.
- Advanced myocardial imaging reveals subtle functional impairment even in virologically suppressed individuals.
- These findings open new translational avenues to target the HIV reservoir as a strategy to reduce long-term cardiovascular comorbidity in HIV care.

ACKNOWLEDGEMENTS: Participants for their selfless contribution

FUNDING: PID2022-141317OB-I00