



Pharmacokinetic and clinical observations in people over 50

Retinal vascular calibres in HIV-positive men over 50 years compared to similarly aged HIV-negative and younger HIV-positive controls

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Background

- Cerebral small vessel disease (CSVD) is associated with circulating inflammatory mediators
- The association between HIV and stroke raises the question of whether HIV is also associated with CSVD
- Retinal vascular measurements are biomarkers of the risk of CSVD, stroke, cognitive impairment and coronary heart disease

Aim

- To determine the association between HIV status, age and retinal vascular measures in a UK-based sample of men living with HIV and a comparable group of HIV-negative controls

Results

Groups were generally well-matched on cardiovascular risk variables, except for differing rates of hepatitis C ($p=0.03$ by 3-way Chi-square), syphilis ($p=0.004$) and previous stroke/TIA ($p=0.07$) (Table 1).

Table 1. Participant characteristics

	PLWH aged ≥ 50 (n=120)	PLWH aged < 50 (n=39)	HIV-negative aged ≥ 50 (n=52)
Age, median y (IQR)	59 (54, 65)	44 (41, 48)	60 (55, 65)
BP, median (IQR)			
Systolic	127 (118, 139)	124 (114, 132)	129 (116, 140)
Diastolic	79 (72, 85)	78 (71, 84)	80 (72, 85)
Current smoker, n(%)	22 (18.3)	13 (33.3)	8 (15.4)
Ever smoked, n(%)	64 (53.3)	27 (69.2)	33 (63.5)
Drug use in past 6 months, n(%)	37 (30.8)	15 (38.5)	15 (28.8)
Lipids, median mmol/L (IQR)			
Total cholesterol	5.0 (4.4, 5.6)	5.1 (4.6, 5.7)	5.0 (4.3, 5.8)
HDL	1.3 (1.0, 1.6)	1.3 (1.1, 1.6)	1.3 (1.0, 1.6)
LDL	2.8 (2.3, 3.5)	2.9 (2.4, 3.3)	3.0 (2.3, 3.5)
Framingham 10y risk, median % (IQR)	7.3 (5.3, 9.6)	2.8 (2.1, 4.2)	7.6 (5.9, 13.7)
Medical history, n(%)			
CHD	17 (14.2)	1 (2.6)	5 (9.6)
Stroke or TIA	7 (5.8)	0	0
Syphilis	53 (44.2)	11 (28.2)	10 (19.2)
HCV	13 (10.8)	3 (7.7)	0
CD4+ count, median cells/mm ³ (IQR)	600 (470, 750)	740 (490, 930)	n/a
Time since starting ART, median y (%)	13.1 (6.8, 17.6)	6.8 (5.1, 11.5)	n/a

Methods

- POPPY is a cohort study of 3 demographically matched groups (PLWH aged ≥ 50 years; PLWH aged < 50 years; HIV-negative aged ≥ 50 years)
- Inclusions: white, male participants in POPPY
- Exclusions: PLWH who did not have VL < 50 copies/mL on ART; diabetes mellitus
- Optic disc-centred 45° colour fundus photography was carried out
- Outcomes were central retinal arterial estimate (CRAE); central retinal venous estimate (CRVE); arterial-venous ratio (AVR)
- Each outcome was compared between groups with 3-way ANOVA
- The association of factors including participant group with AVR was estimated in linear regression models

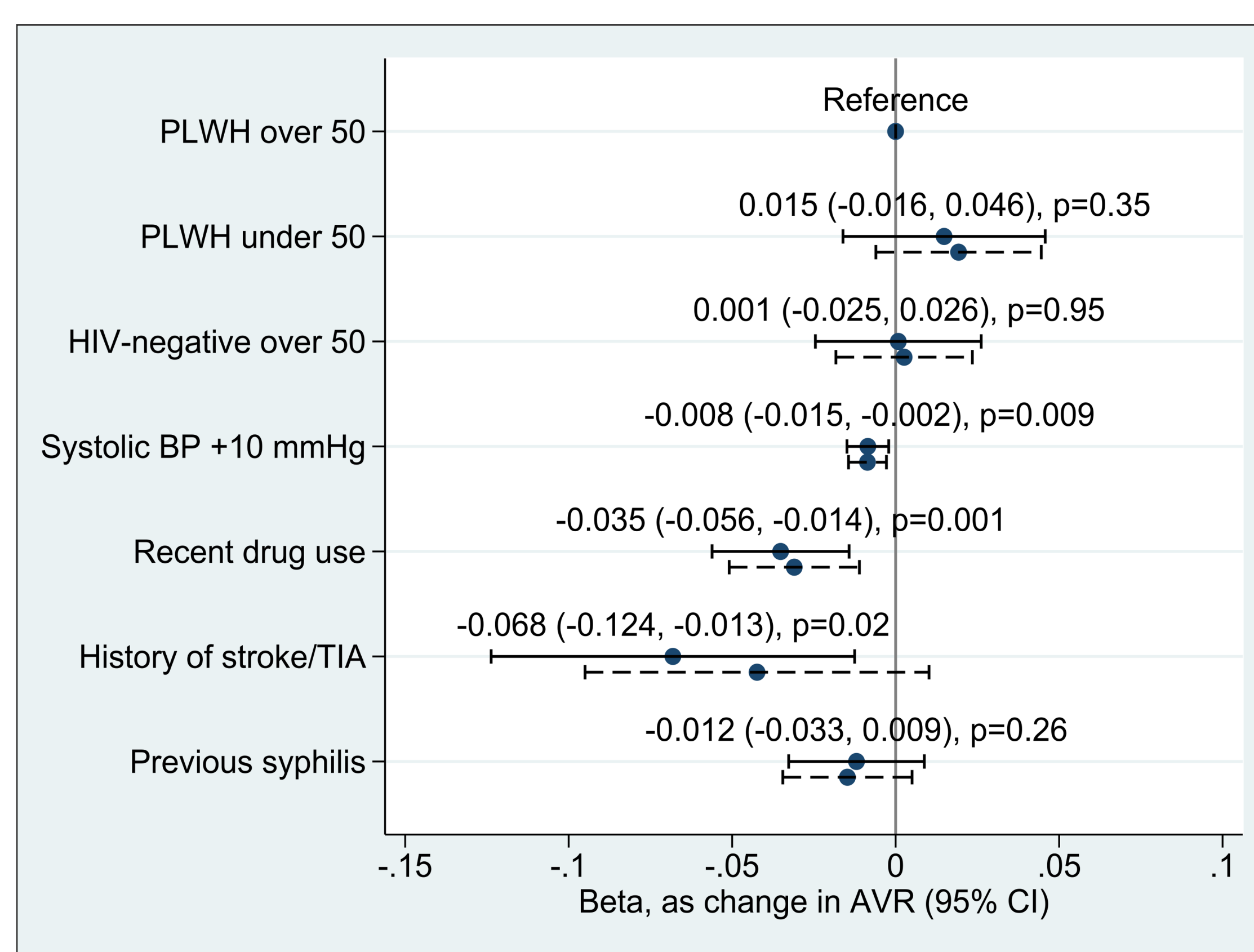
There were no differences between the three groups on any of the retinal vascular outcome measures (Table 2).

Table 2. Retinal vascular measurements

	PLWH aged ≥ 50 (n=120)	PLWH aged < 50 (n=39)	HIV-negative aged ≥ 50 (n=52)	p (3-way comparison)
Central retinal arterial estimate	142.0 (20.2)	142.9 (20.3)	138.6 (20.4)	0.51
Central retinal venous estimate	199.1 (29.1)	195.6 (27.7)	193.4 (26.1)	0.46
Arterial-venous ratio (AVR)	0.72 (0.06)	0.74 (0.09)	0.72 (0.07)	0.32

Results are expressed as mean (SD)

Figure 1. Multivariate analysis of factors associated with AVR



In a linear regression model including study group and all factors with $p < 0.2$ on bivariate analyses, there were associations between AVR and blood pressure, stroke history and recreational drug use, but not study group (unadjusted as dashed lines, and adjusted as solid lines, shown in Figure 1).

Summary

- We found no association between participant group (PLWH aged ≥ 50 years; PLWH aged < 50 years; HIV-negative aged ≥ 50 years) and retinal vascular measurements in white, UK-based men
- This supports the conclusion that there is no association between HIV status and retinal vascular ageing (and by extrapolation, cerebral small vessel disease)
- Signs, symptoms and risk factors associated with cerebral small vessel disease should be addressed in PLWH in the same manner as HIV-negative individuals

Discussion

- Our findings agree with those of another study of retinal vascular measurements in a younger, predominantly female population in South Africa [1]
- Two MRI studies and one autopsy study also found no difference in cerebral small vessel disease rates between PLWH and HIV-negative controls [2,3,4]
- In contrast, two MRI studies comparing PLWH and HIV-negative controls have found higher levels of CSVD in the HIV positive participants [5,6]

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