Prevalence and characteristics of HIV-associated stroke in a South African setting

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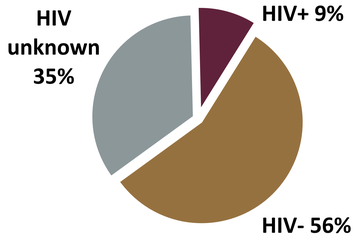
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BACKGROUND

- Two-thirds of the world's HIV population live in Sub-Saharan Africa, with South Africa having the greatest absolute number of HIV-infected individuals in the world.[1]
- The burden of stroke and other non-communicable disease is increasing in these countries.[2]
- Data on HIV-associated stroke in South Africa in the antiretroviral treatment (ART) era is limited.

- **Primary objective:** To determine the prevalence of HIV in patients presenting with acute symptomatic stroke in Tygerberg Hospital.
- **Secondary objective:** To compare patient characteristics, risk factors, clinical characteristics and brain-imaging with age-matched HIV-negative patients.

Figure 1. Prevalence and age distribution



Period prevalence:
9.3% (95% CI 7.4-11.2%)
Average ages:
HIV positive: 46 (± 11) years
Without HIV: 54 (± 13) years

METHODS

- We conducted a retrospective study in Tygerberg Hospital of included patients presenting in the 12-month period from January 1st 2019 to December 31st 2019.
- **Inclusion criteria:** adults presenting with any type of stroke (ischaemic, haemorrhagic, venous and transient ischaemic attacks)
- Patients were identified by keyword search of CT brain reports and ICD.10 codes.
- HIV status was ascertained from laboratory data, and HIV+ and HIV- patients were age-matched (1:2 ratio) for further comparison. Clinical and imaging data were extracted from medical records.

**Hpt: hypertension; DM: diabetes mellitus; Dyslipid.: dyslipidaemia; Cardiac consists of atrial fibrillation, valvular disease and cardiomyopathy; Social is combination of following risk factors: smoking, alcohol, and substance use.*

Stroke patients with HIV were on average a ***decade younger***, and when *age-matched*, had *less traditional cardiovascular risk factors*, and *more concurrent infections* than **patients without HIV**, especially those with a lower CD4 count.

RESULTS

- We identified 884 strokes (**Figure 1**).
- Mean age at presentation in HIV+ was 46 ± 11 years compared to 55 ± 14 years in HIV- (p<0.001).
- Hypertension and dyslipidaemia were significantly less prevalent in HIV+ :
  - Hypertension: 53.7% vs 70.1%, p=0.011; dyslipidaemia: 13.4% vs 29.9%, p=0.005 (**Figure 2**).
- Concurrent infection was more prevalent in HIV+ , largely in patients with CD4 count <200cells/mL:
  - TB meningitis (n=7), disseminated TB (n=6), pulmonary TB (n=5),
  - Syphilis (n=4), cryptococcal meningitis (n=2) and 2 other infections (n=2)
- HIV+ with higher CD4 counts of similar age had more traditional risk factors compared to their lower CD4 counterparts.

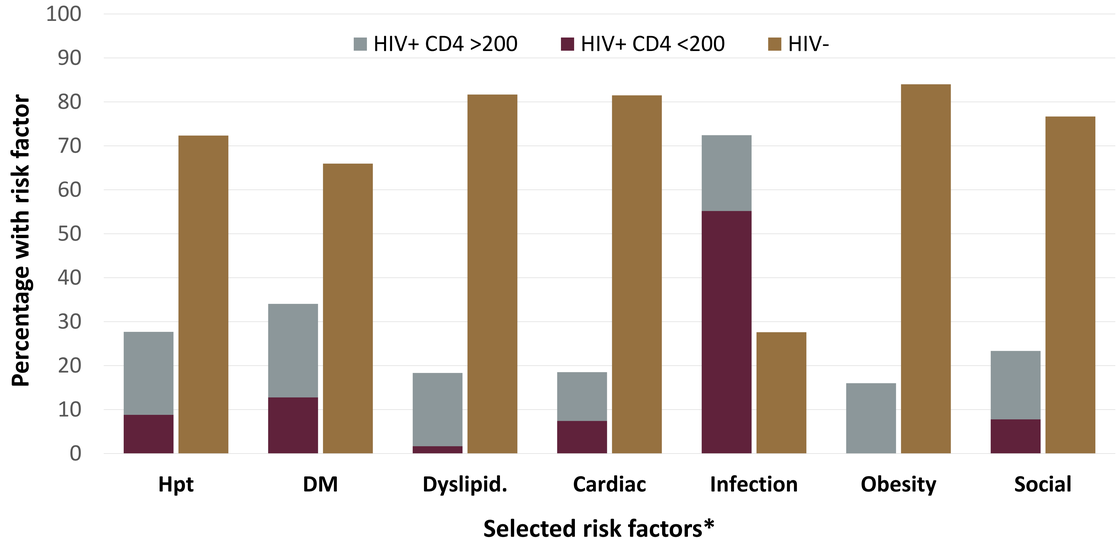


Figure 2. Comparison of risk factors

RESULTS CONTINUED

- Among HIV+, 68.3% were on ART, and 39.3% had been started or restarted on ART within the past 6 months. Thirty-two patients (42.7%) had defaulted treatment at some time in the past.
- The HIV+ radiological phenotype differed from that of age-matched HIV-negative CT brain reports (**Figure 3**).

A. Basal ganglia infarcts (35.6% vs 18.3%, p=0.014)

B. Involvement of >1 vascular territory (22.0% vs 7.7%, p=0.009)

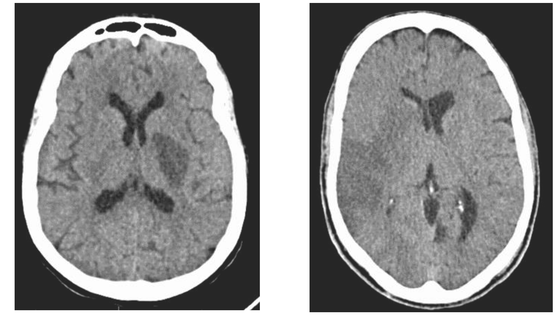


Figure 3. Examples of axial pre- and post-contrast CT brains of study participants with HIV showing **(A)** an acute left basal ganglia infarct and **(B)** a large right MCA as well as a right PCA territory infarct (older left PCA infarct not visible in this section)

- Clinical presentation, ischaemic stroke aetiology, and in-hospital mortality and hospital stay length did not differ between groups.

CONCLUSIONS

- We found a minimum prevalence of 9.3% (95% CI 7.4-11.2%) of HIV in patients presenting with acute stroke in Tygerberg Hospital.
- ART has transformed HIV into a chronic disease, with stroke as a serious complication of the interplay between cardiovascular risk factors and underlying HIV infection in an aging HIV+ population.
- Understanding the multifactorial mechanisms underlying increased stroke risk, including associated infections and potential ART-associated immune reconstitution, is crucial and needs further study.

References on request from the corresponding author (ericdecloedt@sun.ac.za)