Neurocognitive Functioning in Ugandan Adolescents with HIV: Rural and Urban Differences

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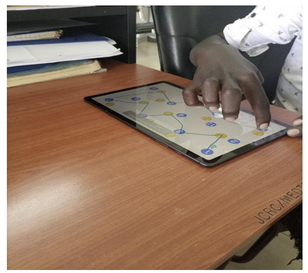
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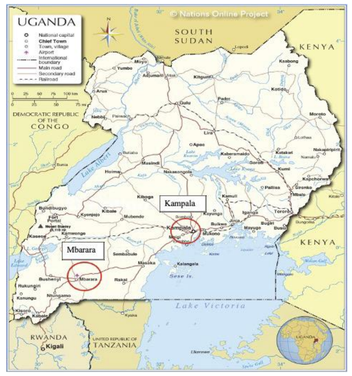
BACKGROUND

- Neurocognitive impairments are prevalent in youth living with perinatally acquired HIV (YPHIV) and persist despite sustained viral suppression.
- **We compared neurocognitive test performance among YPHIV living in urban and rural regions of Uganda using NeuroScreen.**

NeuroScreen (NS)



Tablet-based neurocognitive test battery adapted for Uganda assessed domains of attention, executive function, motor speed, processing speed, verbal learning and memory.



METHODS

Study design and setting

- Cross sectional study in two HIV clinics in Uganda (Mbarara and Kampala)

Eligibility criteria

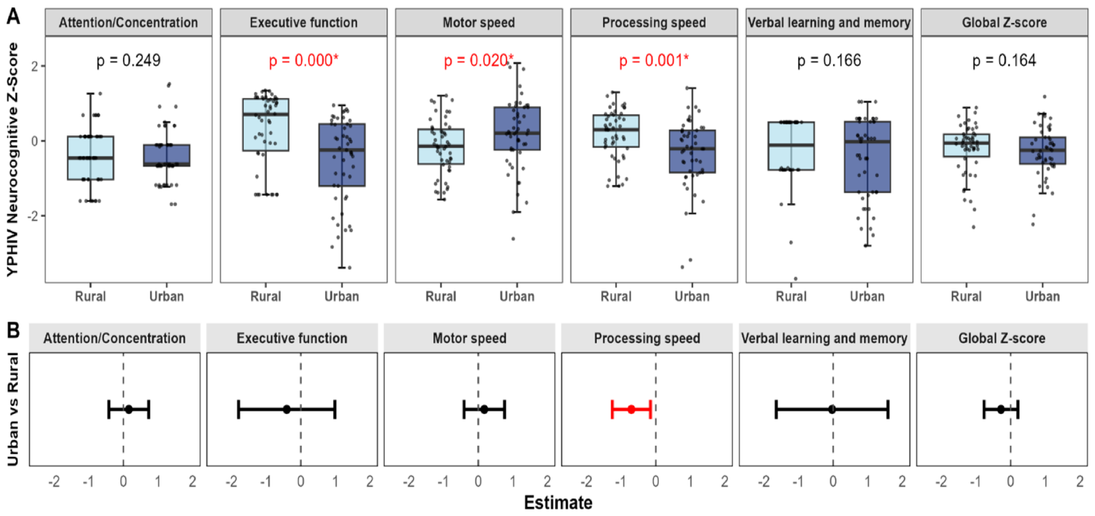
- 12-19 years of age
- YPHIV
- On stable ART for ≥6 months
- HIV 1 RNA < 50 c/mL

Statistical Analyses

- Domain-specific and global z-scores were calculated using age- and sex-matched HIV-uninfected youth from each site (urban or rural).
- Stepwise regression models examined differences between test scores by site after adjusting separately age, sex, education, and HIV covariates.

ART regimen type may have more impact on neurocognition (processing speed) than sociodemographic factors

Figure: NeuroScreen Z-scores among rural (n=49) and urban (n=48) YPHIV



A: Box plots showing NS median and interquartile ranges with p values between rural and urban YPHIV
B: Forest plots of regression models showing estimates and 95% confidence interval adjusted for site (rural as the reference), age, sex, education, and HIV factors (ART duration, viral load and ART regimen).

RESULTS

- Median age was younger in urban vs rural participants [13.1(IQR 12-14.8), 15(IQR 14-17)];
- Most participants were female (rural 60.4%, urban 53.1%) and in primary school (rural 58.3%, urban 51.0%).
- All rural participants were on DTG based regimens (27% on ABC, 73% on TDF), compared to 46% of urban participants (remaining participants: 8% on ABC, 54% on TDF).
- Panel A highlights unadjusted NeuroScreen domain and global score differences between urban and rural YPHIV.
- Panel B highlights regression models for domain and global scores adjusting for age, sex, education and HIV factors
- After adjusting for age, sex and education level, being on DTG ART vs non-DTG ART was associated with better processing speed (β=0.675, 95% CI: 0.057, 1.294, p= 0.033) in rural compared to urban areas.

CONCLUSIONS

- Despite viral suppression, YPHIV in urban Uganda appear to have worse processing speed compared to those in rural areas.
- Sociodemographic differences seem to have less impact on processing speed domain of neurocognition than type of ART regimen.
- Since most youth have now transitioned to DTG, ongoing studies in both settings will assess if INSTIs can have a potentially positive effect on neurocognitive outcomes.

ACKNOWLEDGMENT

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PLAIN LANGUAGE SUMMARY

Youth with perinatally acquired HIV in urban Uganda seem to have slower processing speed than those in rural areas despite viral suppression. Being on dolutegravir might help improve thinking and processing skills.