452

High frequency of dementia in antiretroviral naive HIV+ individuals in rural Uganda

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Background:

- The frequency and risk factors for each stage of HIV-associated neurocognitive disorder (HAND), *i.e.*, asymptomatic neurocognitive impairment (ANI), (*i.e.*, abnormalities on neuropsychological testing without functional complaints), mild neurocognitive disorder (MND), and HIV dementia (HAD), in rural Sub-Saharan Africa, where almost 70% of the global HIV+ population resides, are largely unknown.
- In a previous study performed prior to the development of the HAND classification system, HIV dementia was seen in 31% of 81 antiretroviral (ARV) naïve HIV+ individuals in Kampala, Uganda[1].

Objective:

- To evaluate the frequency and risk factors for HIV dementia in rural Rakai, Uganda where HIV subtype D and A predominate.

Methods:

- 323 ARV naïve HIV+ and 303 HIV- individuals, from the Rakai Community Cohort Study received detailed neurological history, examination, neuropsychological tests, functional assessments, CD4 count, and plasma HIV RNA levels.
- HAND stage was determined using Frascati Criteria[2] combining clinical, neurological, functional, and neuropsychological test data.
- Results in HIV+ individuals were compared to normative data obtained from a subset (n=210) of the HIV-negative individuals in Rakai, Uganda.

Neuropsychological test battery

Domain	Test
Verbal learning	WHO UCLA verbal learning Test (learning trials)
Verbal Memory	WHO UCLA verbal delayed recall
Gross Motor	Timed Gait
Fine Motor	Finger Tapping
	Grooved Pegboard, dominant and non dominant hand
Speed of Processing	Symbol digit
	Color Trails-part 1
Executive Function	Color Trails-part 2
Verbal Fluency	Animal naming
Attention	Digit span forward
Working memory	Digit span backward

Functional assessments

- Karnofsky score
- Instrumental activities of daily living
- Patient assessment of function inventory(PAOFI)
- Bolton functional assessment[3]
- Family caregiver assessment of function

Results: Demographics

n	HIV+ 323	HIV- 303
Age-[Years-Mean (SD)]	35.6 (8.5)	35.5 (8.0)
Male-gender %	51.5	55.1
Education [years-Mean (SD)]	5.2 (3.2)	5.4 (3.5)
CD4 count [Mean (SD)]	309 (159)	–

- There was no difference in age, gender, or education between HIV+ and HIV- individuals.

Frequency of HAND Stage

	HIV+ %	HIV- %	p Value
Normal Cognition	42	46	
Asymptomatic Neurocognitive impairment (ANI)	16	18	
Mild Neurocognitive disorder (MND)	21	23	
Dementia	**23**	**7**	**<0.001**
HAND (ANI + MND + dementia)	**58**	**54**	**0.048**

- HIV+ individuals were more likely to have dementia (25%) compared to HIV- individuals (9%) ($p< 0.001$).
- HIV+ individuals were more likely to have cognitive impairment (58%) compared to HIV- individuals (54%) ($p= 0.048$).

Risk factors for HIV dementia

- Risk factors for HIV dementia included subjective memory problems ($p=0.002$), depression symptomatology ($p< 0.001$) and impaired performance on the International HIV dementia scale screening test ($p< 0.001$), and timed gait test ($p<0.001$).

Discussion

- This study represents one of the largest studies of cognitive performance and HAND using a detailed neuropsychological test battery and multiple functional assessments among HIV+ and HIV- individuals in rural Sub-Saharan Africa.
- Cognitive impairment was common among both HIV+ and HIV- individuals with a slight increase among HIV+ individuals .
- Antiretroviral naïve HIV+ individuals were more likely to have dementia compared to demographically matched HIV- individuals providing justification for early initiation of combination antiretroviral therapy.

Discussion (Contd)

- There were no differences in the frequency of asymptomatic neurocognitive impairment or mild neurocognitive disorder among HIV+ and HIV- individuals suggesting that causes other than HIV disease could be contributing to mild stages of cognitive impairment (*e.g.*, effects from alcohol, depression, vascular risk factors, poor nutrition, infectious etiologies such as malaria).
- Health care practioners in Africa should recognize the high frequency of cognitive impairment among the 27 million HIV+ individuals in Sub-Saharan Africa and adjust public health programs in order to improve treatment of HIV infection.

Conclusion

- HIV+ individuals are more likely to have dementia than demographically matched HIV- individuals in rural Uganda.
- Future studies will evaluate the association of HIV dementia and subtype, blood and cerebrospinal surrogate markers and response to antiretroviral treatment**.**

References

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