

Global Deficit Score (GDS) in Persons Living with HIV (PLHIV) and Mild Neurocognitive Disorder (MND)

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Background

Neurocognitive symptoms cause concern among aging PLHIV. Neuropsychological (NP) testing is the gold standard for diagnosing MND, but analysis of NP data is complex. One approach to using NP results for research purposes is converting them to a GDS, which summarizes overall cognitive performance.

Methods

Study participants

HIV positive adults (≥ 19 years) with cognitive complaints not readily explained by another diagnosis (e.g. cerebral trauma, stroke)

Procedures

- Comprehensive evaluation in an HIV Neurology Specialty Clinic, including
 - history of HIV, comorbid conditions, and substance use
 - physical examination including neurological examination
 - Cognitive screening tests: Montreal Cognitive Assessment (MoCA) [1] and HIV Dementia Scale (HDS) [2,3]
- Body mass index (BMI), VACS Index [4], and Framingham scores [5] were calculated as markers of comorbid conditions
- Antiretroviral treatment history, AIDS-defining illnesses, CD4 and plasma viral load results were obtained from the BC-CfE Drug Treatment Program database
- Study protocol and informed consent were approved by the UBC/Providence Health Care Research Ethics Board (H10-00762)

Global Deficit Scores (GDS)

- 44 participants requiring further cognitive evaluation underwent full NP testing
- NP test results were summarized using a GDS
 - GDS ≥ 0.5 was considered indicative of cognitive impairment [6]

White Matter Densities (WMD)

A subset of participants (N=31) who had brain MRI performed for clinical assessment had WMD scored using established visual scales.

- Age-Related White Matter Changes (ARWMC) [7]
- Fazekas Visual Scale [8]

Statistical analysis

Between participants with GDS < 0.5 ("normal") and those with GDS ≥ 0.5 ("impaired") :

- Categorical variables were compared using chi-square test
- Continuous variables were compared using Wilcoxon rank sum test

References

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Results

Table 1: Baseline characteristics of study population (N =44)

	N (%) or median (Q1-Q3)
Male	42 (95.5%)
Female	2 (4.5%)
Age, years	53 (48-58)
Caucasian ethnicity	34 (77%)
GDS < 0.5 (normal)	18 (41%)
GDS ≥ 0.5 (impaired)	26 (59%)
Receiving Antiretroviral Therapy (ART)	44 (100%)
ART includes efavirenz	1 (2%)
ART includes an INSTI*	12 (27%)
Plasma viral load < 40 copies/mL	36 (82%)
Current CD4 count, cells/mm ³	480 (310-610)
Nadir CD4 count, cells/mm ³	150 (70-230)
Time since HIV diagnosis, years	16 (6-22)
Hepatitis C coinfection	11 (25%)

*INSTI, integrase strand transfer inhibitor: raltegravir (n=10), dolutegravir (n=1), or elvitegravir (n=1)

Figure 1: GDS by MoCA and HDS category

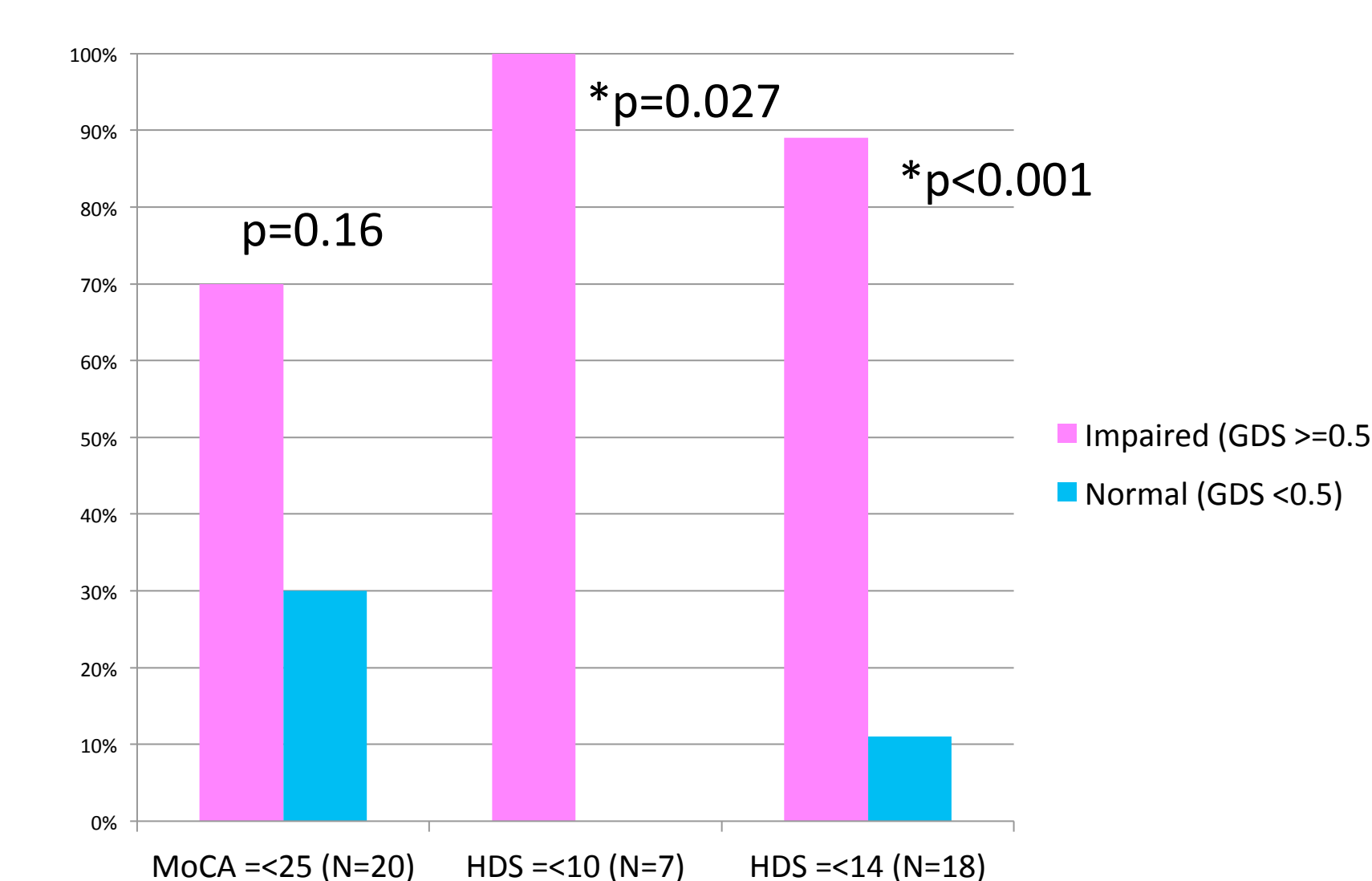
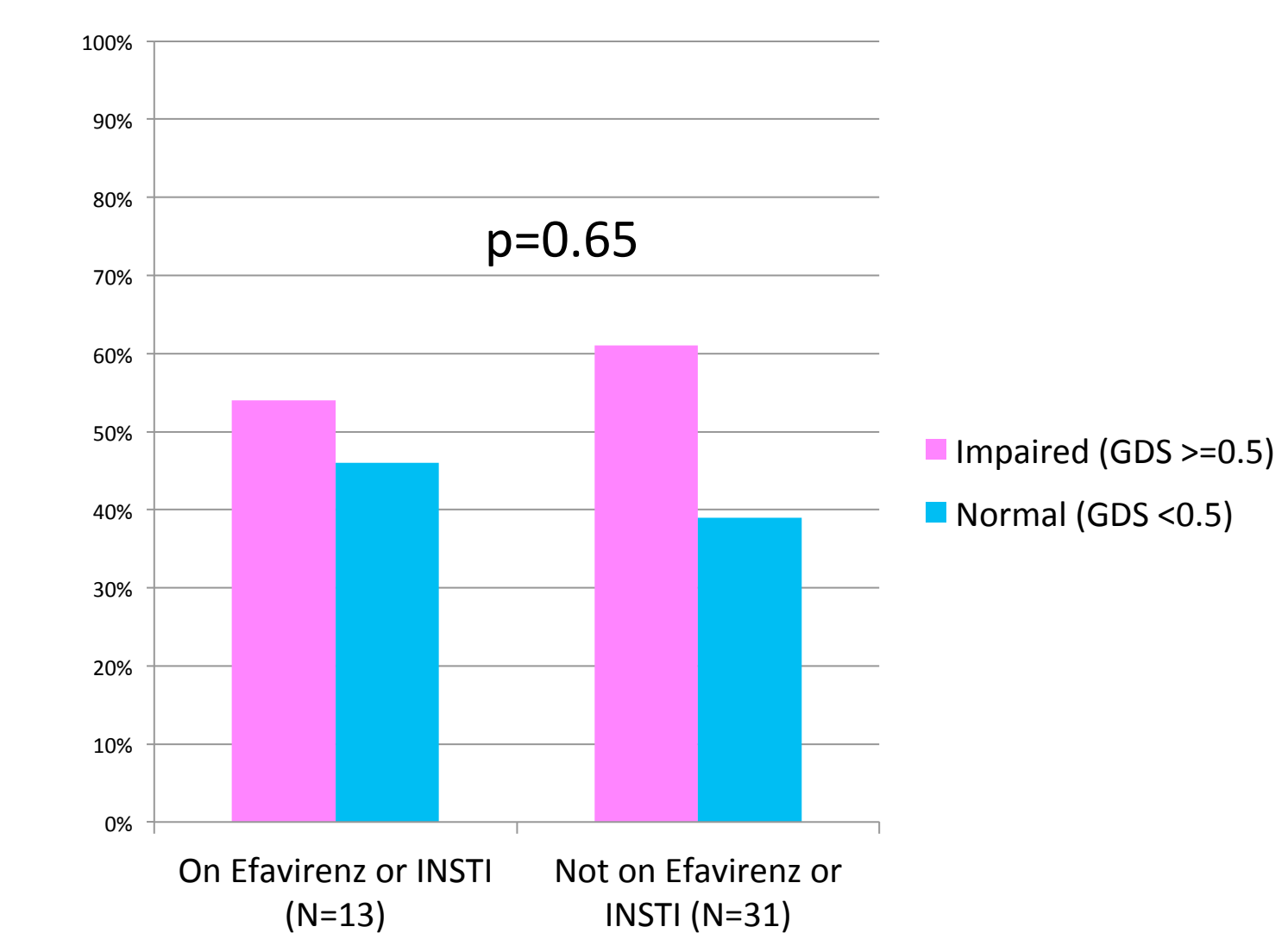


Figure 2: GDS by ART agents



GDS < 0.5 vs. ≥ 0.5 was not associated with ($p > 0.1$):

- gender
- ethnicity
- prior AIDS
- hepatitis C coinfection
- current plasma viral load
- duration of HIV or ART
- receipt of efavirenz or an INSTI
- current or nadir CD4
- MRI white matter scores
- BMI
- VACS
- Framingham score

Conclusions

- Among 44 HIV+ adults with cognitive symptoms, 41% did not have evidence of a global deficit on NP testing, although milder deficits in individual cognitive domains may have been present.
- MND in PLHIV is likely multifactorial; we were unable to identify any single HIV- or comorbidity-related factor associated with MND in our analysis.
- HDS may be a more sensitive measure of overall cognitive impairment than MoCA using standard cutoff scores.

The authors have no relevant conflicts of interest to disclose.