Obstructive Sleep Apnea Contributes to Cognitive Difficulties Among Older Adults With HIV

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Marie-Josée Brouillette[1], Mahra AlDahbashi[1], Réjean Thomas[2] Marianne Harris[3], Graham Smith[4], Fiona Smaill[5], Shariq Haider[5], Scott L. Letendre[6], Susan Scott[1], Lesley K Fellows[1], Nancy E. Mayo,[1]

[1]McGill University, Montreal, Canada; [2] Clinique Médicale l'Actuel, Montreal, Canada; [3] British Columbia Centre for Excellence in HIV/AIDS, Vancouver, Canada, [4] Maple Leaf Medical Clinic, Toronto, Canada; [5] McMaster University, Hamilton, Canada; [6] University of California San Diego, San Diego, CA, USA

THE AIM

Determine if obstructive sleep apnea (OSA) is associated with cognitive difficulties among older adults with HIV.

METHODS

Who did we assess?

865 individuals (mean age: 53 years) recruited from 5 HIV clinics in Canada between 2013-2016.

How did we assess?

Characterization every 9-12 months for up to 10 years.

- Presence of sleep apnea: 2 questionnaires
  - Berlin (risk low/high)
  - STOP-Bang (risk low/intermediate/high risk)
- Self-reported cognitive difficulties: items from Patient-Deficit Questionnaire and the HIV-specific Communicating Cognitive Concerns, combined with Rasch analysis, range -5.74 to 6.17, SD: 1.67
- Measured cognition: B-CAM, range -2.57 to 4.03, SD: 0.79.

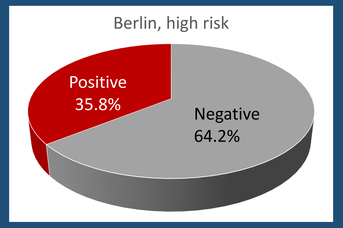
B-CAM, a computerized measure of cognition

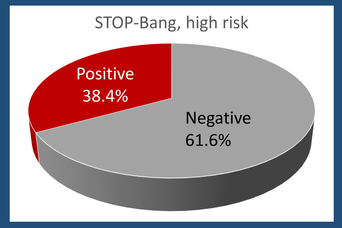
- Tasks: Fluency, Tower of London, Mini trail, Shape 2 back, Digit Symbol coding, Memory/recall, Corsi (forward and backwards), Facial recognition
- Items entered into Rasch analysis, and a total score is produced.

Sleep apnea questionnaires: items

	Questionnaire	
Item	Berlin	STOP-Bang
Snoring	How loud, 4 options	Loud, Y/N
Snoring, frequency	5 options	
Snoring, bothered other people	Y/N	Y/N
Anyone noticed that you quit breathing during your sleep	Frequency, 5 options	Y/N
Feeling tired after sleep	Frequency, 5 options	
Feeling tired during the day	Frequency, 5 options	Y/N
Nodded while driving	Frequency, 5 options	Y/N
High blood pressure	Y/N	Y/N
BMI	BMI ≥ 30 kg/m^2	BMI > 35 kg/m^2
Age > 50		+
Neck size ≥ 16 in (40 cm)		+
Gender = male		+

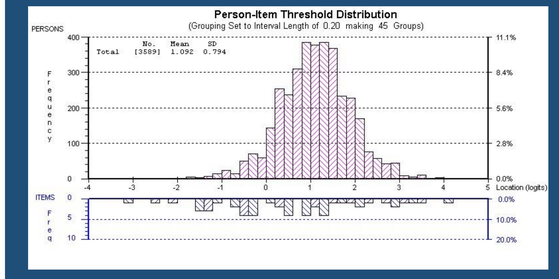
707 participants → 1881 with OSA assessments



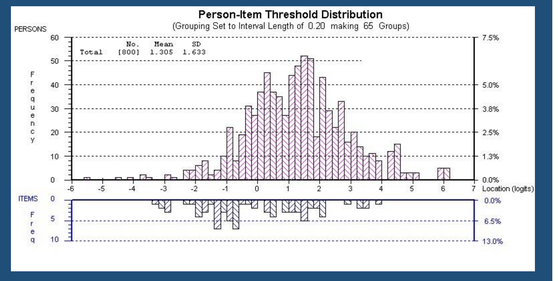


Over 1 in 3 assessments screened positive

MEASURED COGNITION (B-CAM)



SELF-REPORTED COGNITION



	Estimate, 95% CI (higher is better), adjusted for age	
	Berlin, high vs low risk n= 674 assessments	STOP-Bang, high vs low risk n= 722 assessments
Self-reported Cognitive Difficulties (SD: 1.7)	-0.41 (-0.56 to -0.26)	-0.22 (-0.43 to -0.01)
B-CAM (SD: 0.7)	-0.40 (-0.05 to 0.10)	-0.02 (-0.14 to 0.11)



The presence of loud snoring, nearly daily breathing interruptions, and fatigue were statistically predictive of cognitive difficulties.

Statistical analyses

Generalized linear models analyzed associations between OSA screening, cognition, age, and sex.

Characteristics of participants

Included in the analysis	n=707
Age (mean, SD)	55.0 (8.2)
Sex (M), %	84.7%
Education (post-sec), %	70.1%
Ethnicity (European descent), %	72.8%
Duration of HIV years (mean, SD)	16.8 (8.0)
Current CD4 cell count (median, cells/μL)	620
Nadir CD4 cell count (median, cells/μL)	200
Aviremic (≤ 50 copies/mL), %	93.0%
Body Mass Index (BMI), (mean, SD)	26.5 (4.9)
B-CAM, (mean, SD)	1.2 (0.7)
Self-reported cognitive difficulties, (mean, SD)	1.45 (1.67)

CONCLUSIONS

Among older adult with HIV,

- Over 1 in 3 individuals screened positive for OSA
- Screening + was associated with:
  - Significantly more self-reported cognitive difficulties when Berlin positive, but probably not clinically important
  - No impact on performance-based cognition
- Misclassification of OSA on screening items was highly likely because of missing data on snoring/gasping and anthropometric measures.
- Technology is now accessible for accurately detecting sleep anomalies. Researchers and clinicians should incorporate data from these technologies in their decision making.

marie-josee.brouillette@mcgill.ca

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