The Feasibility of Montreal Cognitive Assessment (MOCA) Testing for Neurocognitive Impairment During Routine HIV Clinic Visits at The Michael E. DeBakey VAMC (MEDVAMC)

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Abstract

Background: HIV, aging, and comorbidities contribute to neurocognitive impairment. Patient complexity poses challenges to neurocognitive testing during routine visits. In October 2016, the VA funded neurocognitive feasibility projects. The MEDVAMC pilot began 1/5/2017 and ended 6/22/2017. Three providers offered MoCA testing during routine clinic visits to HIV+ patients >50 y/o.
Objective: The objective was determining patient acceptability, feasibility of same visit testing, acceptance for further neurocognitive assessments and resultant findings.
Method: Patients were characterized by MoCA scores (Normal = ≥26-30, impairment= ≤25), demographics and HIV data.
Results: 101 patients were offered testing; 100 accepted. The test was administered in an 8 minute average and scoring calculated in a 2 minute average. 31 patients scored in the normal (Group 1-mean 26.1), and 69 in impaired ranges (Group 2) (66/3 in mild/severe ranges, respectively-mean 21.68). 17 in Group 2 were offered further neurocognitive assessment, 9 accepted, 6 completed with impairment confirmed in all 6. Demographics/mean(age: 59.7 risk: Gay/Bi-55.9, Het-36.8, IVDU-3.2: education- <12-34.2, >12-65.3)and HIV parameters (mean years positive-19.5, absolute CD4-611, HIV viral load- non-detectable 83%) were similar in Groups 1 and 2 (P>0.05). Only 16%(Group 1) vs 7%(Group 2)were on efavirenz. However, race distribution (%) revealed differences- Group 1: Black(B)-40, White(W)-47, Hispanic(H)-13, (Group 2: (B) -71, (W)- 21, (H)- 8, p = 0.02.
Conclusion: 70% of patients had abnormal MoCA's. 6% had confirmed impairment. MoCA testing is feasible during routine clinic visits and leads to new diagnoses of neurocognitive impairment. Results will inform plans to implement MoCA testing in HIV clinics.

Background

- In the ART era, HIV associated neurocognitive disease(HAND) has been described in approximately 50% of people living with HIV. The majority(44%) of those will have mild disease. Data from the MEDVAMC Clinical Case Registry (CCR), a VA database that interfaces with the VA electronic medical record(CPRS) identified 291 unique patients (out of 843) with a neurocognitive disorder diagnosis between 1/2000 – 9/2016. There was overlap in patients diagnosed with vascular dementia, mild cognitive impairment and/or substance abuse related neurocognitive disorders. We believe that outside of research settings, HAND is a condition that remains largely underdiagnosed.
- The Montreal Cognitive Assessment (MoCA)(Figure 1) has been evaluated in the Veteran population but co-morbidities pose challenges to neurocognitive testing in a routine clinical setting.
- In the general population, prevalence of neurocognitive impairment increases with age and is associated with other co-morbidities such as diabetes mellitus and cardiovascular disease. MEDVAMC 2015 CCR data revealed that of 1010 veterans, 71% were aged > 50 years and 35% were >60. We are possibly facing an unrecognized epidemic of neurocognitive impairment in our aging HIV infected patients, and hence, are in need of screening tools for neurocognitive impairment that can be incorporated in our routine clinical practice.
- The Montreal Cognitive Assessment (MoCA)(Figure 1) has been evaluated in the Veteran population but the multiple clinical co-morbidities that compete for allocated clinic time, including the management of HIV and its associated co-morbidities, pose challenges to neurocognitive testing in a routine clinical setting.
- In October 2016, funding was received for " A Pilot Project To Determine Feasibility of Montreal Cognitive Assessment (MoCA) testing for Neurocognitive Impairment in A Primary Care HIV Clinic". We present here the results of this study.

Objective

The primary objective was to review MoCA scores, referrals for other neurocognitive assessments, HIV data and other comorbid conditions, laboratory values and available imaging relative to cognitive function on the 100 patients ≥50 years of age who were tested on routine clinic visits.

The secondary objective was to evaluate the feasibility and potential barriers of incorporating testing into routine clinical practice.

Methods

- Retrospective chart review of patients that underwent Moca testing as part of "A Pilot Project To Determine Feasibility of Montreal Cognitive Assessment (MoCA) testing for Neurocognitive Impairment in A Primary Care HIV Clinic".
- For the pilot study, three ID providers offered MoCa testing for screening for neurocognitive impairment during routine visits for HIV primary care or ID mental health. Patients with known neurocognitive impairment were excluded from testing. Planned sample size was 100 subjects.
- Patients were grouped according to MoCA scores. Based on a perfect score of 30, groups were as follows: Normal cognitive function with a score of ≥26, cognitive impairment with a score ≤ 25, 18-24 mild impairment and ≤ 17 severe impairment. Patients were further grouped into those who were offered a more thorough neuropsychological evaluation, a referral to Neurology Service or mental health services within Primary Care Mental Health for Cognitive Based Therapy(CBT) rehabilitation intervention.
- Additional data collected included time spent to do the MoCA, scoring time, number of patients who accepted neurology referral, concurrence of a neurocognitive disorder by neuropsychological testing, and number of patients who accepted CBT Intervention.
- Using the CCR, data was collected including demographics (age, race, sex, education), HIV risk factor, length of HIV infection, CD4 levels, HIV viral load, current antiretrovirals and comorbid conditions known to potentially affect neurocognition.
- Linear statistics were calculated using independent t-tests and non-linear using Fisher's exact test.

Results

(Table 1)

	Group 1(MoCA ≤ 25) N= 69	Group 2 (MoCA > 26) N=31	p value
DEMOGRAPHICS			
Age	59.77	59.72	>0.05
Race (%) /Score			<0.02
Black	(70.7)49	(40.0)27	
White	(21.5)23	(46.6)27	
Hispanic	(7.7)20	(13.3)26	
Education(%)			>0.05
< 12 years	(36)25	(64)20	
> 12 years	(33)23	(67)21	
IMMUNE PARAMETERS			
Years HIV positive	18.89	20.03	>0.05
CD4(cells/uL)	624	604	>0.05
CD4: CD8 Ratio	0.86	0.76	>0.05
HIV viral load(RNA copies)-ND(%)	(83)57	(83)	>0.05
COMORBID CONDITIONS (%)			
Diabetes	(32)22	(3)9	>0.05
Depression	(45)31	(42)13	>0.05
Anxiety	(11)8	(19)6	>0.05
Alcohol abuse	(22)15	(23)7	>0.05
Illicit substance abuse	(21)14	(16)5	>0.05
MOCA RESULTS			
Total Score(Mean)	21.6	26.1	<0.01
Visuospatial/Executive			
Trail Making	0.63	0.90	<0.01
Cube Drawing	0.37	0.83	<0.01
Clock Drawing	2.43	2.64	>0.05
Naming (Animals)	2.71	2.96	<0.01
Attention			
Digits	1.69	1.90	<0.02
Letter list	0.85	1.00	<0.01
Serial 7's	2.00	2.83	<0.01
Language			
Repetition	1.15	1.54	<0.01
Fluency	0.60	0.90	<0.01
Abstraction	0.88	1.48	<0.01
Delayed Recall	2.21	3.80	<0.01
Orientation	5.85	5.90	>0.05

Results continued

- 101 patients were offered testing; 100 accepted. The test was administered in an 8 minute average and scoring calculated in a 2 minute average.
- 31 patients scored in the normal range(Group 1)mean score 26.1, and 69 in impaired ranges (Group 2)mean 21.68 (66/3 in mild/severe ranges, respectively). 17 in Group 2 were offered further neurocognitive assessment, 9 accepted, 6 completed the evaluations with neurocognitive impairment confirmed in all 6. Three patients in Group 2 had MoCA scores ≤ 17 and were categorized as severely impaired.
- Demographics and clinical characteristics are shown in Table 1. The groups were similar in age, immune parameters and prevalence of co-morbid conditions, however differed in race/ethnicity distribution.
- MoCA results(Table 1) revealed significant differences in visuospatial /executive function with the exception of clock drawing(See Figure 2 for representative examples).The groups also had statistically significant differences in the domains of naming, attention, language, abstraction and delayed recall but not in the orientation domain.

Figure 1

MOCA

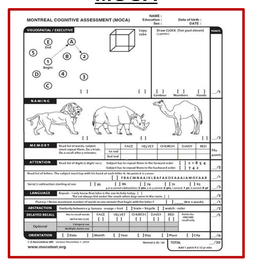
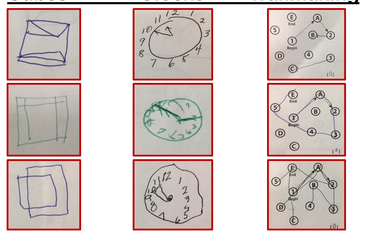


Figure 2

Patient Visuospatial /Executive Function

- **Cubes** **Clocks** **Trailmaking**



Discussion and Conclusions

- This pilot confirmed that a significant number of patients tested had mild neurocognitive impairment and the prevalence(70%) mirrored that of other studies in people living with HIV.
- MoCA testing is feasible during routine clinic visits and leads to new diagnoses of neurocognitive impairment.
- As neurocognitive impairment in HIV infection is likely multifactorial, a multidisciplinary approach for testing and management that includes physical, social, psychiatric comorbidities, and cognitive assessments must all be considered.
- Though testing by providers is feasible, "computerized cognitive assessments that could quickly be administered in clinic", could enhance screening.[4] A MoCA app is already available.

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