SciMedCentral

Annals of Psychiatry and Mental Health

Research Article

Cognitive Impairment in Older Adults Attending Primary Care in a Low-Income Urban Academic Practice

Raisa Epistola[1*], Jennifer Henry[2], Amy Holland[1], Olga Achildi[3], and Mary F. Morrison[1,4]

[1]Department of Psychiatry, Lewis Katz School of Medicine at Temple University, USA
[2]Institute for Clinical Psychology, Widener University, USA
[3]Department of Psychiatry, University of Pennsylvania, USA
[4]Department of Psychiatry and Internal Medicine, Lewis Katz School of Medicine at Temple University, USA

*Corresponding author
Raisa Epistola, Temple University Lewis Katz School of Medicine, Department of Psychiatry, 100 East Lehigh Ave, Suite 105, Philadelphia, PA 19125, USA, Fax: 215-707-3544. Email: raisae@temple.edu

Submitted: 02 June 2016

Accepted: 15 July 2016

Published: 17 July 2016

ISSN: 2374-0124

OPEN ACCESS

Keywords
- Primary care
- Cognitive impairment
- Screening
- African-American

Abstract

Objectives: To ascertain the prevalence of cognitive impairment in the low income, urban geriatric population, and, to assess the prevalence of treatable mental health problems that could contribute to cognitive impairment.

Methods: Geriatric patients (age 65+, N=79) were recruited when they presented for scheduled medical care at an academic primary care clinic in a low-income neighborhood of Philadelphia, Pennsylvania. Participants answered questions regarding their demography, psychiatric history, and substance use history. The General Practitioner Assessment of Cognition (GPCOG) was used as the screening instrument, and the following standardized tools were also administered: Geriatric Depression Scale (GDS-5), Geriatric Anxiety Inventory (GAI-SF), and the Charlson Comorbidity Index. A urine specimen was tested for drugs of abuse.

Results: Based on the GPCOG screen, the prevalence of cognitive impairment was 78%. Severe cognitive impairment, consistent with a diagnosis of dementia, was observed in 19% of the study population. All subjects with positive urine drug screens were in the impaired group and most drugs detected were prescribed by physicians.

Conclusions: The majority of elderly patients receiving primary care in a low-income urban setting have some degree of cognitive impairment, some consistent with frank dementia. All subjects with a positive urine drug screen were cognitively impaired. Detecting cognitive impairment should prompt consideration of the effects of prescribed medication on cognition. In addition substance use disorders should be considered. Screening for cognitive impairment in older adults can detect reversible causes of impairment and prompt discussion about the effects of medication and substance use on cognition.

ABBREVIATIONS

GPCOG: The General Practitioner Assessment of Cognition; GDS-5: Geriatric Depression Scale; GAI-SF: Geriatric Anxiety Inventory; MCI: Mild Cognitive Impairment

INTRODUCTION

Cognitive impairment is often unrecognized and under-diagnosed in primary care [1]. For this reason, screening for cognitive impairment among older adults in primary care is an area of intense research. The clinical concept of mild cognitive impairment (MCI) is evolving, with recognition that some patients with MCI may progress to dementia, some may have stable cognitive deficits and some patients may improve over time [2]. Unlike dementia, MCI is not severe enough to interfere with independence in daily life, but there may be mild deficits in the instrumental activities of daily living. The MCI syndrome seen in geriatric populations as an expression of an emerging neurodegenerative disorder that may lead to dementia, is heterogeneous. The syndrome may coexist with systemic, neurologic, or psychiatric disorders that can cause cognitive deficits [2]. As part of the Affordable Care Act, an annual wellness visit was added as a benefit for Medicare enrollees, and an assessment for cognitive impairment using a validated tool is

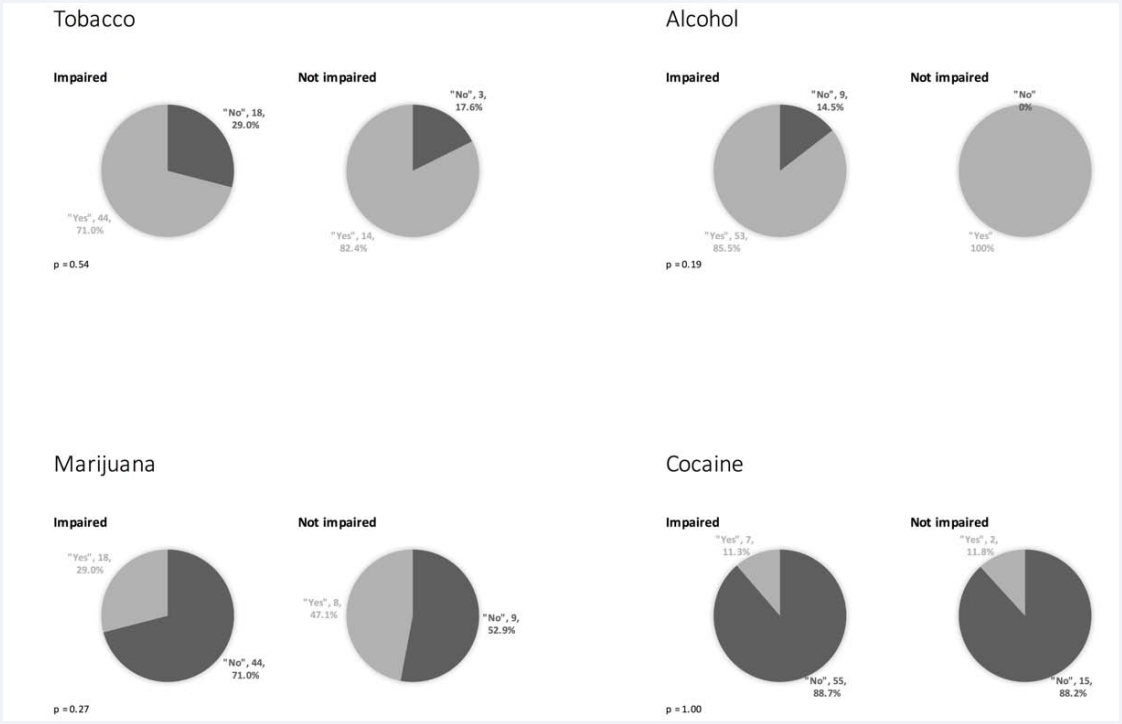

Figure 1 Impaired is defined as GPCOG <9. Data is reported as ["Response", n, %].

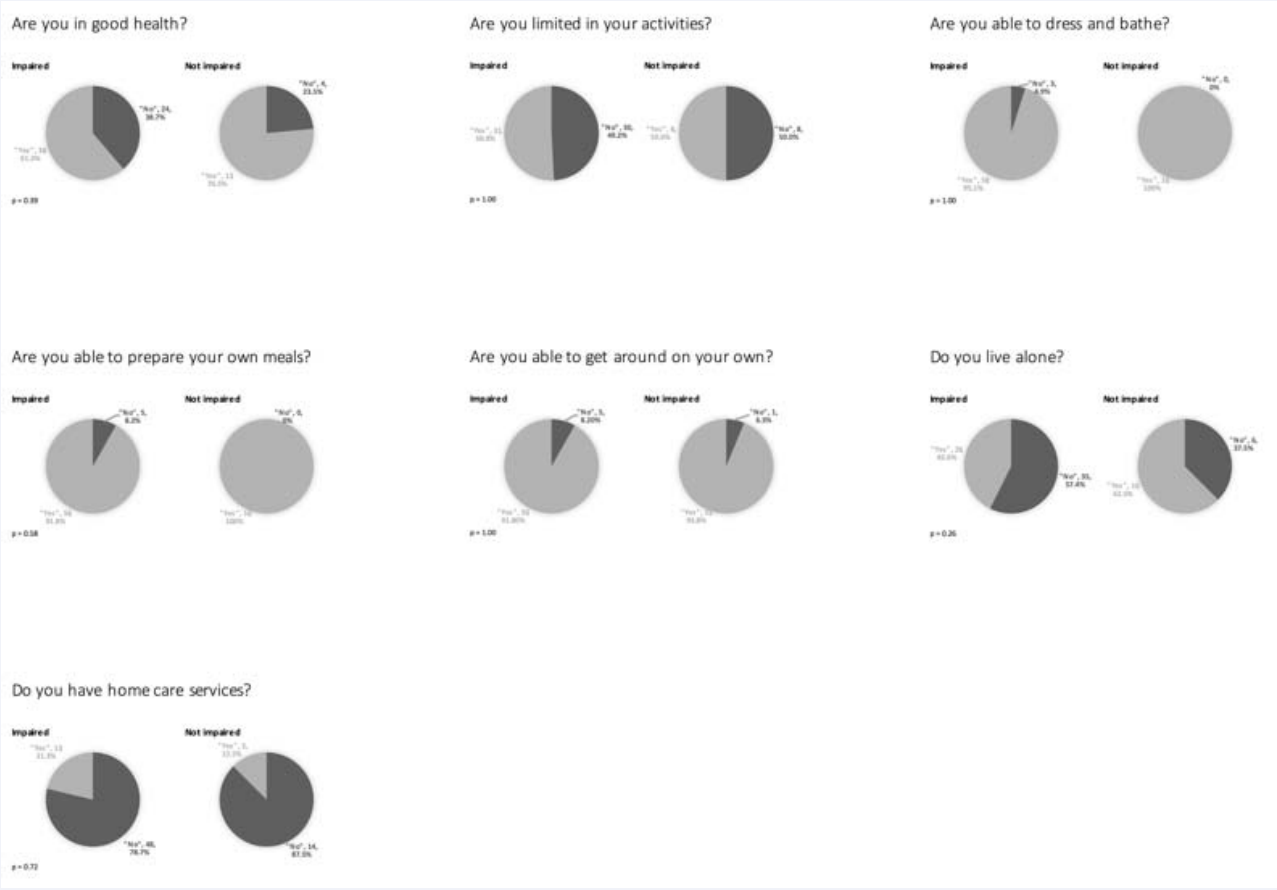

Figure 2 Impaired is defined as GPCOG <9. Data is reported as ["Response", n, %].

recommended as part of the visit [3]. In a recent US study of a nationally representative community-based older adult sample, 55.2% of participants with dementia reported no history of cognitive evaluation by a physician [4]. In the U.K., more than half of those with dementia never receive a diagnosis [5], and Swedish primary care providers overlook cognitive disturbance or dementia in 74% of patients who already have a diagnosis [6].

Cognitive impairment can interfere with medication adherence, financial management and other daily activities. It is also an independent mortality risk factor [7]. Early recognition of cognitive disorders in older adults can lead patients, their families and the primary medical team to consider expert diagnosis and treatment. Earlier detection of cognitive impairment could also prompt conversations about safe monitoring of complex behaviors, like driving. Identification of cognitive impairment in older adults should prompt a search for reversible and modifiable causes of impairment. Reversible causes include: medications, depression, substance use disorders, thyroid disorders and vitamin B12/folate deficiency [8]. Modifiable causes include vascular risk factors and poor dietary habits.

Recent research in diverse racial and socioeconomic settings has provoked questions about the role of illicit drugs, psychiatric comorbidities, and overall health on the development and prevalence of cognitive impairment in low-income urban populations. Because of these unresolved questions, we conducted a pilot study of the prevalence of cognitive impairment, mood and anxiety symptoms, and substance misuse in older adults attending the General Internal Medicine Clinic at Temple University Hospital in Philadelphia, Pennsylvania.

MATERIALS AND METHODS

Subjects

Patients aged 65 and older who presented for routine primary care visits at Temple University Hospital's General Medicine outpatient clinic were screened, and eligible subjects were offered to participate in a study of mental health in older adults. Subjects were not excluded based on gender or demographic criteria. Subjects were excluded if they demonstrated a lack of capacity to consent to the study or were unable to speak or read English. Informed consent was obtained from subjects agreeing to participate in the study. The protocol was approved by the Institutional Review Board of Temple University and all participants provided written informed consent.

Measures

Subjects were asked to verbally answer questions regarding their general health and health practices (including participation in medical care), activities of daily living, supports and in-home services, psychiatric history, substance use history (including tobacco, alcohol, prescription and illicit drugs). The following standardized tools were administered verbally to minimize the effects of sensory and motor disabilities on their responses, and to increase patient comfort: Geriatric Depression Scale, 5 item short version [9]; Geriatric Anxiety Inventory, short form [10]; and General Practitioner Assessment of Cognition [11], and the Charlson Comorbidity Index [12].

GPCOG is a brief, efficient dementia and cognitive impairment screening instrument for use by general practitioners [11]. It is one of three patient measures in the Cognitive Assessment Toolkit located on the Alzheimer's Association website because it is brief, relatively free of educational bias and was validated in primary care. The validity was assessed by comparison with the criteria for diagnosis of DSM-IV dementia in a sample of Australian community dwelling older adults representing a broad socioeconomic cross section [11]. The survey consists of a patient examination and an optional informant interview for patients with scores of 5-8. GPCOG patient examination was the only screening measure used, as we did not want to exclude subjects without informants. The patient examination assesses orientation to time, clock drawing, reporting a recent event, and word recall. Performance scores on these tasks are tallied for a maximum total of 9 points, which indicates absence of cognitive impairment. Scores of 8 and below indicate an increasing likelihood of cognitive impairment. A score of 7 or 8 on the GPCOG was equivalent to a score of 24 or 25 on the Mini Mental Status Exam [11]. The instrument's performance is independent of years of education, physical and mental health and Geriatric Depression scale score [11]. Participants were divided into no impairment (GPCOG=9) and any impairment groups (GPCOG >9) based on their GPCOG scores. For the clock drawing task, subject data were also analyzed using a clock drawing error analysis developed by M. C. Lessig and colleagues [13]. Based on this analysis, six errors associated with dementia are: 1) wrong time indicated; 2) number substitution; 3) number repetition; 4) no hands; 5) missing numbers; and 6) refusal to draw the clock. In a university-based memory clinic, making any one of the six errors during clock drawing had 88% specificity and 71% sensitivity for the diagnosis of dementia in an ethnically diverse U.S. population of older adults with at least 5 years or more of education. After completion of the questionnaires, participants were asked to provide a urine sample to test for the current presence of illicit substances. Urine was collected in a container with a unique subject identification number assigned to each container, corresponding to the number on the questionnaire. A five panel multi-drug test card for cocaine, marijuana, opiates, amphetamines, benzodiazepines (DOA-754 distributed by Innovacon, Inc., San Diego CA) was used to test the urine within 10 minutes of providing the sample.

Subject confidentiality

Confidentiality was assured by omitting identifying information on the questionnaire and urine sample. We assigned numbers to each subject to link the questionnaires and urine sample and to organize the data for analysis.

Data analyses

Data from 79 out of 80 participants who consented and completed the research protocol were selected for data analysis. Data from one subject who did not complete most of the assessments was eliminated. All data were double-entered individually and merged into a master file for data analysis. Missing data was noted and results are presented only for available data. Data were analyzed using IBM SPSS Statistics version 22. Frequency distributions were calculated

for characteristics of interest. Independent t-tests were used to compare means. Chi-square and Fisher's exact statistics were used for categorical data. Statistical tests were 2-tailed with $p < 0.05$ considered significant.

RESULTS

The study population was primarily African American (79.5%), female (66.3%), had an average of 12.4 years of schooling and moderate medical comorbidity (Table 1). In the zip code of the clinic (19140), less than half of the residents 65 and older graduated from high school. Therefore, our study population was slightly more educated than the older adult population in the zip code [14]. Income data were not requested from participants, but 30% of older adults living in the clinic zip code report an income below the poverty level [14]. Common self-reported medical comorbidities using the Charlson Comorbidity Index included: diabetes mellitus without end organ damage (31.2%), peptic ulcer disease (15.6%), chronic obstructive pulmonary disease (14.3%), congestive heart failure (14.3%) and myocardial infarction (14.3%). The mean Charlson score for all subjects was 2.0, corresponding to a 48% risk of death from comorbid disease over 10 years [12]. Most of the participants had a GPCOG cognitive screen that suggested cognitive impairment with 62 (78.5%) participants demonstrating impairment and only 17 (21.5%) participants demonstrating no impairment. Subjects without cognitive impairment (GPCOG score = 9) had more years of education than the subjects with cognitive impairment. The demographics of participants with and without

Table 1: Demographic information by cognitive impairment status.

CHARACTERISTIC VALUE *[n, % of group]*	IMPAIRMENT[1] (n=62, 78.5%)	NO IMPAIRMENT[2] (n=17, 21.5%)	P
Age [mean(SD), n]	73.3(6.3), 62	72.1 (7.5), 17	0.52
Gender *[n, % of group, % of total]*			
Male	20, 32.3%, 25.3%	6, 35.3%, 7.6%	
Female	42, 67.7%, 53.2%	11, 64.7%, 13.9%	
Total	**62**	**17**	1.00
Race[3] *[n, % of group, % of total]*			
Black	49, 80.3%, 62.8%	13, 76.5%, 16.7%	
White	4, 6.6%, 5.1%	3, 17.6%, 3.8%	
Hispanic	5, 8.2%, 6.4%	0, 0.0%, 0.0%	
Asian	2, 3.3%, 2.6%	0, 0.0%, 0.0%	
Other	1, 1.6%, 1.3%	1, 5.9%, 1.3%	
Total	**61**	**17**	NS
Marital Status *[n, % of group, % of total]*			
Single	10, 16.1%, 12.7%	5, 29.4%, 12.7%	NS
Married	13, 21.0%, 16.5%	3, 17.6%, 16.5%	
Divorced	13, 21.0%, 16.5%	4, 23.5%, 16.5%	
Separated	3, 4.8%, 3.8%	1, 5.9%, 3.8%	
Widowed	23, 37.1%, 29.1%	4, 23.5%, 29.1%	
Total	**62**	**17**	
Education Level[4] *[mean(SD), n]*	11.7(3.1), 62	15.1(3.1), 17	<0.01
Total GDS *[mean(SD),n]*	1.0(1.1), 62	0.8(1.3), 17	0.40
Total GAI *[mean(SD), n]*	1.1(1.7), 62	0.9(1.4), 17	0.59
Total Charlson[5] *[mean(SD), n]*	2.0(2.0), 61	1.94(2.3), 16	0.87

Abbreviations: Impairment defined as GPCOG <9.
No impairment is GPCOG = 9.
1 subject with missing data on race
Includes 1 participant who responded to completed college, unclear if completed 2 or 4 year program. Subject conservatively assumed to have finished 2 year program.
2 subjects with missing Charlson data

Table 2: Current substance use by cognitive impairment status.

SUBSTANCE *[n, % of group]*	IMPAIRMENT[1] (n=62, 78.5%)	NO IMPAIRMENT[2] (n=17, 21.5%)	P
SELF REPORT			
Tobacco			
No	54, 87.1%	14, 82.4%	
Yes	8, 12.9%	3, 17.6%	
Total	**62**	**17**	**1.00**
Alcohol			
No	35, 56.6%	12, 70.6%	
Yes	27, 43.5%	5, 29.4%	
Total	**62**	**17**	**0.20**
Marijuana			
No	59, 95.2%	17, 100%	
Yes	3, 4.8%	0, 0.0%	
Total	**62**	**17**	**0.53**
Cocaine			
No	62, 100%	17, 100%	
Yes	0, 0.0%	0, 0.0%	
Total	**62**	**17**	**NS**
UDS[3] RESULTS			
Benzodiazepine			
Negative	48, 88.9%	16, 100%	
Positive	6, 11.1%	0, 0.0%	
Total	**54**	**16**	0.33
Opioid			
Negative	53, 98.1%	16, 100%	
Positive	1, 1.9%	0, 0.0%	
Total	**54**	**16**	**1.00**
Marijuana			
Negative	53, 98.1%	16, 100%	
Positive	1, 1.9%	0, 0.0%	
Total	**54**	**16**	**1.00**
Amphetamine			
Negative	54, 88.9%	16, 100%	
Positive	0, 0.0%	0, 0.0%	
Total	**54**	**16**	**NS**
Cocaine			
Negative	54, 100%	16, 100%	
Positive	0, 0.0%	0, 0.0%	
Total	**54**	**16**	**NS**

Abbreviations: Impairment defined as GPCOG <9.
No impairment is GPCOG = 9.
UDS: urine drug screen

cognitive impairment are shown in the impairment group, 31 subjects scored 7-8, 16 subjects scored 5-6 and 15 subjects (19% study population) scored less than 5. Scores of 7-8 can represent either mild cognitive impairment or normal cognitive function and scores less than 5 are consistent with impairment seen in patients with dementia [19]. There were significant differences between the cognitive impairment and no-impairment groups in educational achievement (11.7 vs. 15.1(3.1) years of education, p=0.00). No other significant differences in demographic or medical measures were noted between the two groups. For example, in the subgroup with diabetes, 23/62 (37.1%) were in the impaired group and 6/17 (35.3%) were in the unimpaired group. Among participants without cognitive impairment, the mean age was 72.1 years old. The majority was female (64.7%), African American (76.5%) and had completed an average of 15.1 years of education. The participants without impairment were not depressed (mean GDS= 0.8) or anxious (mean GAI= 0.9). Among subjects with cognitive impairment, the mean age was 73.3 years old. Similar to the unimpaired group, the majority of participants with cognitive impairment were female (67.7%), and African American (80.3%). Subjects completed an average of 11.7 years of education and 37.1% were widowed. The participants with impairment were not significantly depressed (mean GDS= 1.0) or anxious (mean GAI= 1.1) on screening. In the impaired group, the majority of participants were able to recall today's date (93.5%, 58/62) and a recent news item from the past week (90.1%, 55/61, 1 subject missing) on the GPCOG. The group particularly struggled with the delayed recall item, which accounts for 4/9 points on the GPCOG and clock drawing (2 points). Specifically, for the clock drawing, 23/62 (37.1%) failed to draw clock number correctly, and 20/62 (32.3%) failed to draw clock hands correctly. Clock drawing was also analyzed using the Lessig analysis for the diagnosis of dementia [13]. In the impaired group, 26 of 62 (41.9%) participants made one or more of the six errors associated with dementia.

The urine drug screen (UDS) revealed benzodiazepines (N=6), opiates (N=1) and one current marijuana user (Table 2). All subjects with positive urine drug screen (UDS) results were in the cognitive impairment group (N=8). Some subjects with positive results for benzodiazepines (5) and opiates reported prescriptions accounting for their UDS results. There were no positive urine results for cocaine or amphetamines and UDS was not obtained in 9 participants. Examining current substance use by self-report, 43.5% of impaired and 29.4%% of non-impaired subjects reported current use of alcohol. There was no difference in self-reported current substance use between the impaired and the non-impaired groups. For past substance use, most subjects reported past use of alcohol (89%), approximately one third of subjects reported past use of marijuana and over 10% reported past use of cocaine (Table 2).

The majority of subjects said they were in good health (Figure 2). While roughly half of participants reported limitations in their activities, almost all the subjects in both the no cognitive impairment and cognitive impairment groups reported being able to dress and bathe, both of which are activities of daily living (ADLs). Similarly, for instrumental activities of daily living (IADLs), such as preparing meals and getting around on their own, very few subjects reported difficulties with performance. A minority of patients in both groups had home care services.

DISCUSSION

Over 75% of the participants in our study screened positive for cognitive impairment using the GPCOG. This is a much higher prevalence than previously reported in the elderly population primary care population, even considering that the GPCOG is only a screening tool. In a validation of the GPCOG in primary care (in Italy), 56% (38 of 68) of elderly primary care patients recruited from the National Health System scored between 5-8 on the GPCOG and no one scored less than 5 [15]. Presumably, the difference is due to the fact that the subjects in this study came from a low-income community, which must therefore impart one or more additional medical or sociological risk factors. The nature of these additional risk factors is not clear, since several medical and demographic conditions, including race, gender and age, were evenly distributed between the cognitively impaired and non-impaired groups. The only significant differences between the two groups were a lower educational level and positive urine drug screen among the impaired group. Substance use, both prescription and illicit, contributed to some of the cognitive impairment in this population, since all of the subjects with positive results on the urine drug screen were in the cognitive impairment group. The deleterious effects of the prescription medications, both benzodiazepines and opiates, on cognition, are likely under appreciated by their primary care physicians. In a longitudinal study, mean follow-up of 7.6 years, of the impact of polypharmacy on cognitive functioning, older patients who took benzodiazepines (or a related drug) and an opioid experienced a decline in cognitive functioning when compared with controls [16]. These findings indicate the necessity of conversation between primary care providers and their elderly patients regarding benzodiazepine and opioid use, so that providers may gauge the potential impact that prescription medications may have on the current and future cognitive functioning of elderly patients. Nevertheless, substance use/abuse is unlikely to explain the large difference in prevalence of cognitive impairment in this population.

The subjects in the cognitively-impaired group did not demonstrate significant depressive or anxiety symptoms which could have been a reversible source of cognitive impairment. Nor was significant substance abuse detected by self-report or urine drug screen, another potentially reversible cause of impairment. A previous report noted that high rates of cognitive impairment among low income African Americans were associated with less education, but not with anxiety, depression, or a history of substance misuse [17]. While a significant number of study subjects had diabetes and diabetes is a risk factor for higher rates of cognitive decline [18], subjects with diabetes were not over-represented in the cognitively impaired group. Most of the subjects (51/62, 82%) who screened positive for cognitive impairment were in the "indeterminate" range (5-8), and scores down to 7 can be associated with normal cognitive function [19]. The informant component of the GPCOG can be helpful in this range, as it provides an independent assessment of independent activities of daily living (IADLs) and memory. Unfortunately, a significant group of older adults do not have an informant available. Although most subjects said they had activity

limitations, few reported impairment in IADLs (preparing meals, getting around) and activities of daily living (ADLs). Lack of self-reported activity impairment may suggest milder cognitive deficits, with subtle impact on daily activities. Alternatively, some subjects likely have normal cognition and for others, self-reported functional impairment may have been embarrassing to admit to interviewers with "yes" or "no" answers. Fifteen out of 79 subjects (19%) scored less than 5, scores that indicate a high likelihood of dementia. Using an error analysis of the clock-drawing component of the GPCOG, 42% of the subjects in the cognitively impaired group or 32.9% (26 of 79) of our total study population had performance that suggested a significant likelihood of dementia. This high prevalence might raise concerns that use of Lessig's error analysis for clock drawing does not translate well from a University-based memory clinic setting to a primary care outpatient practice. However, in a population-based sample from the Canadian study on Health and Aging, Lessig's error analysis performed well as a screening test for dementia, comparable to the other published scoring systems based on clock-drawing [20]. The fact that a high percentage of patients in our sample committed an error indicative of likely dementia may indeed reflect unrecognized cognitive impairment, which is of great concern for preserving health and function in an older population from a low income community. Our study population was predominantly self-identified as black (83.8% of participants who indicated their race). Thus, while it is not possible to discuss racial differences in cognitive impairment in primary care based on our study findings, it is worth noting that 49 of 62 (79.0%) of black participants were found to be cognitively impaired by the GPCOG. Although this is similar to the incidence of cognitive impairment in the non-black cohort (13/17 = 76.5%), the number of subjects is too small to draw conclusions about the association between race and cognitive impairment in the elderly. Previous reports have indicated higher rates of cognitive impairment among urban black elderly individuals than in their white counterparts [21,22]. Research has highlighted how residential segregation and the related experiences of social segregation may isolate elderly blacks from social and cognitive interactions that would facilitate performance on cognitive tests, as well as potentially making them distrustful of medical settings or of cognitive or neuropsychological assessments [18].

The limitations of this study generally have to do with the non-random nature of the sample and most participants were women, which is typical of geriatric studies. Overall, our subjects were more educated compared with the older adult population living around the clinic zip code. Since higher education is associated with better cognitive performance, this study may actually underestimate the prevalence of cognitive impairment syndrome in the older adult population of the North Philadelphia community. Since subjects had to provide written informed consent for a urine drug screen and study assessments, this study may underestimate the prevalence of illicit substance use as well.

In a recent systematic review, the U.S. Preventive Services Task Force noted that while brief instruments can adequately detect dementia, there is no evidence that screening improves outcomes [23]. The Preventive Services review focused on data regarding mild-moderate dementia and mild cognitive impairment. The mild cognitive impairment *syndrome* can have multiple causes, including some which are potentially reversible. This syndrome which can include medication effects, systemic, or psychiatric disorders that can cause cognitive deficits, as well as mild cognitive impairment and milder dementias. Identifying and correcting reversible cognitive deficits in older adults is likely to improve outcomes and this issue has not received sufficient attention. Further examination while broadening the focus to aging associated cognitive impairments will help clarify the harms and benefits.

CONCLUSION

Cognitive impairment in the elderly is more prevalent in low income populations than in the general community. This difference cannot be accounted for by symptoms of depression or anxiety. However, consideration regarding the use of commonly abused substances, whether prescribed or illicit, is important because all subjects with positive urine drug screens were in the impaired group. As elderly patients are living with multiple medical comorbidities, recognition and discussion of cognitive impairment during patient visits may enable providers to address reversible causes of impaired cognition, including prescribed medications, such as benzodiazepines and opiates, and substance use disorders.

ACKNOWLEDGEMENTS

We appreciate the review of the draft manuscript by Tania Giovanetti, Ph.D. and the assistance of Michael Woods, B.A., and Marius Commodore M.D during the study.

REFERENCES

1. Holsinger T, Plassman BL, Stechuchak KM, Burke JR, Coffman CJ, Williams JW Jr, et al. Screening for cognitive impairment: comparing the performance of four instruments in primary care. J Am Geriatr Soc. 2012; 60: 1027-1036.
2. Lopez OL. Mild cognitive impairment. Continuum (Minneap Minn). 2013; 19: 411-424.
3. Borson S, Frank L, Bayley PJ, Boustani M, Dean M, Lin PJ, et al. Improving dementia care: the role of screening and detection of cognitive impairment. Alzheimer's & Dementia. 2013; 9: 151-159.
4. Kotagal V, Langa KM, Plassman BL, Fisher GG, Giordani BJ, Wallace RB, et al. Factors associated with cognitive evaluations in the United States. Neurology. 2015; 84: 64-71.
5. Milne A, Culverwell A, Guss R, Tuppen J, Whelton R. Screening for dementia in primary care: a review of the use, efficacy and quality of measures. Int Psychogeriatr. 2008; 20: 911-926.
6. Olafsdóttir M, Skoog I, Marcusson J. Detection of dementia in primary care: the Linköping study. Dement Geriatr Cogn Disord. 2000; 11: 223-229.
7. Sachs GA, Carter R, Holtz LR, Smith F, Stump TE, Tu W, et al. Cognitive impairment: an independent predictor of excess mortality: a cohort study. Ann Intern Med. 2011; 155: 300-308.
8. Langa KM, Levine DA. The diagnosis and management of mild cognitive impairment: a clinical review. JAMA. 2014; 312: 2551-2561.
9. Rinaldi P, Mecocci P, Benedetti C, Ercolani S, Bregnocchi M, Menculini G, et al. Validation of the five-item geriatric depression scale in elderly subjects in three different settings. J Am Geriatr Soc .2003; 51: 694-698.
10. Byrne GJ, Pachana NA. Development and validation of a short form of

the Geriatric Anxiety Inventory--the GAI-SF. Int Psychogeriatr. 2011; 23: 125-131.

11. Brodaty H, Pond D, Kemp NM, Luscombe G, Harding L, Berman K , Huppert FA, et al. The GPCOG: a new screening test for dementia designed for general practice. J Am Geriatr Soc. 2002; 50: 530-534.

12. Charlson ME, Pompei P, Ales KL, MacKenzie CR. A new method of classifying prognostic comorbidity in longitudinal studies: development and validation. J Chronic Dis. 1987; 40: 373-383.

13. Lessig MC, Scanlan JM, Nazemi H, Borson S. Time that tells: critical clock-drawing errors for dementia screening. Int Psychogeriatr. 2008; 459-470.

14. US Census Bureau Quick Facts. statistics for zip code 19140. 2013.

15. Pirani A, Brodaty H, Martini E, Zaccherini D, Neviani F, Neri M, et al. The validation of the Italian version of the GPCOG (GPCOG-It): a contribution to cross-national implementation of a screening test for dementia in general practice. Int Psychogeriatr. 2010; 22: 82-90.

16. Puustinen J, Nurminen J, Löppönen M, Vahlberg T, Isoaho R, Räihä I, et al. Use of CNS medications and cognitive decline in the aged: a longitudinal population-based study. BMC Geriatr. 2011; 11: 70.

17. Simning A, Conwell Y, van Wijngaarden E. Cognitive impairment in public housing residents living in Western New York. Soc Psychiatry Psychiatr Epidemiol. 2014; 49: 477-485.

18. Glymour MM, Manly JJ. Lifecourse social conditions and racial and ethnic patterns of cognitive aging. Neuropsychol Rev. 2008; 18: 223-254.

19. Basic D, Khoo A, Conforti D, Rowland J, Vrantsidis F, Logiudice D, et al. Rowland Universal Dementia Assessment Scale, Mini-Mental State Examination and General Practitioner Assessment of Cognition in a multicultural cohort of community-dwelling older persons with early dementia". Australian Psychologist, 2009; 44: 40-53.

20. Jouk A, Tuokko H. A reduced scoring system for the Clock Drawing Test using a population-based sample. Int Psychogeriatr. 2012; 24: 1738-1748.

21. Tang MX, Cross P, Andrews H, Jacobs DM, Small S, Bell K, et al. Incidence of AD in African-Americans, Caribbean Hispanics, and Caucasians in northern Manhattan. Neurology. 56:49-56.

22. Lopez OL, Jagust WJ, Dulberg C, Becker JT, DeKosky ST, Fitzpatrick A, et al. Risk factors for mild cognitive impairment in the Cardiovascular Health Study Cognition Study: part 2. Arch Neurol. 2003; 60: 1394-1399.

23. Lin JS, O'Connor E, Rossom RC, Perdue LA, Eckstrom E. Screening for cognitive impairment in older adults: A systematic review for the U.S. Preventive Services Task Force. Ann Intern Med. 2013; 159: 601-612.

Cite this article

Epistola R, Henry J, Holland A, Achildi O, Morrison MF (2016) Cognitive Impairment in Older Adults Attending Primary Care in a Low-Income Urban Academic Practice. Ann Psychiatry Ment Health 4(5): 1075.