Original Research Article

Dementia and Geriatric Cognitive Disorders

Dement Geriatr Cogn Disord 2011;32:209–215
DOI: 10.1159/000334047

Accepted: September 29, 2011
Published online: November 16, 2011

Association of Cognitive Function and Risk for Elder Abuse in a Community-Dwelling Population

XinQi Dong[a] Melissa Simon[b] Kumar Rajan[a] Denis A. Evans[a]

[a]Rush University Medical Center and [b]Northwestern University Medical Center, Chicago, Ill., USA

Key Words
Elder abuse · Cognitive function · Mini-Mental State Examination

Abstract
Aim: This study aimed to examine the cross-sectional association between cognitive function and elder abuse. ***Methods:*** The Chicago Health and Aging Project (CHAP) is a population-based study conducted in a geographically defined community (n = 8,932). We identified 238 CHAP participants who had elder abuse reported to a social services agency. Cognitive function was assessed using the Mini-Mental State Examination (MMSE), the Symbol Digit Modalities Test (perceptual speed), and both immediate and delayed recall of the East Boston Memory Test (episodic memory). An index of global cognitive function scores was derived by averaging the z-scores of all tests. Logistic regression models were used to assess the association of cognitive function domains and risk of elder abuse. ***Results:*** After adjusting for confounders, lowest tertiles of global cognition (odd's ratio, OR 4.18, 95% confidence interval, 95% CI 2.44–7.15), MMSE (OR 2.97, 95% CI 1.93–4.57), episodic memory (OR 2.27, 95% CI 1.49–3.43) and perceptual speed (OR 2.37, 95% CI 1.51–3.73) were associated with increased risk of elder abuse. The lowest levels of global cognitive function were associated with an increased risk of physical abuse (OR 3.56, 95% CI 1.08–11.67), emotional abuse (OR 3.02, 95% CI 1.41–6.44), caregiver neglect (OR 6.24, 95% CI 2.68–14.54), and financial exploitation (OR 3.71, 95% CI 1.88–7.32). ***Conclusion:*** Lower levels of global cognitive function, MMSE, episodic memory and perceptual speed are associated with an increased risk of elder abuse.

Introduction

Elder abuse is a substantial global public health and human rights problem. The World Health Organization has declared that elder abuse is a violation of one of a human being's most basic fundamental rights – to be safe and free of violence. Available data suggest that 1 out of 10 US elderly persons experiences abuse each year, and many of them experience it in multiple forms [1, 2]. This trend is particularly alarming as the literature suggests that elder abuse is associated with an increased risk of morbidity and mortality [3–5]. The US National Research Council has urgently called for rigorous research on all aspects of elder abuse, especially through population-based epidemiological studies [6].

Prior prevalence studies of elder abuse have varied from 5 to 30%, depending on the survey methodology and population studied [2, 7]. The National Center on Elder Abuse suggests that only 1 out of 14 cases of elder abuse is reported [8]. Recent studies have suggested the prevalence of elder abuse is about 10–15% and estimated

KARGER

Fax +41 61 306 12 34
E-Mail karger@karger.ch
www.karger.com

Accessible online at:
www.karger.com/dem

XinQi Dong, MD, MPH
Rush Institute for Health Aging
1645 West Jackson, Suite 675
Chicago, IL 60612 (USA)
Tel. +1 312 942 3350, E-Mail xinqi_dong@rush.edu

the incidence of elder abuse to be about 10% [9]. Evidence further suggests that elder abuse is more common among those with cognitive impairment and dementia, and that mortality-associated elder abuse is most prominent among those with lower levels of cognitive function [4].

Prior studies in clinical settings and more selected populations suggest that cognitive impairment and dementia increase the risk of elder abuse. In 1993, Coyne et al. [10] found that 11.9% of the clinically diagnosed dementia caregivers in their sample reported having committed physical abuse to their care recipients. In 1992, Paveza et al. [11] found a rate of severe physical abuse toward care recipients with Alzheimer's disease of 5.4%, which is similar to Pillemer and Suitor's [12] finding of 5% in a similar sample. Homer and Gilleard [13] found physical abuse occurring amongst 14% of caregivers to dementia patients in a respite care program. In a study by Cooper et al. [14] of 220 family caregivers of dementia patients who were referred to psychiatric services, 52% of caregivers reported some abusive behavior and 34% reported high levels of abuse. In a convenience sample, Wiglesworth et al. [15] studied the issues of elder abuse among those with dementia diagnosed from a medical chart review. They found that elder abuse as defined by an expert panel occurred in more than 47% of the dementia participants.

Prior to our present study we were aware of only one population-based cohort study examining the issues of cognitive function and elder abuse. Lachs at al. [16] matched the Connecticut Social Services Agency data to established populations for the epidemiological studies of the elderly (EPESE) cohort (n = 2,812) and found 47 cases of elder abuse. In their study cognition was measured using the Pfeiffer Short Portable Mental Status Questionnaire and cognitive impairment was defined as a score of 4 or more errors out of 10. In the pooled logistical regression model of a stepwise selection procedure, the authors found that cognitive impairment was associated with an increased risk of elder abuse.

However, most elder abuse studies involving cognitive impairment and dementia cases are from clinical settings or more selected populations rather than from representative community populations. In addition, the measurements of cognitive function have mostly relied on brief cognitive screening measures and methods prone to floor and ceiling effects. More specifically, most of these prior studies have only relied on the clinical diagnosis of dementia, which is likely to be representative of the severest form of cognitive impairment. In addition, we are not aware of any studies that have quantified the severity of dementia or cognitive impairment along the continuum. Despite the important contribution of these prior studies, we have incomplete knowledge of the relations between the full spectrums of cognitive function with respect to elder abuse in community-dwelling populations.

In this manuscript, we examine the association between specific cognitive domains and the risk of elder abuse. Our underlying hypothesis is that lower levels of global cognitive function, Mini-Mental State Examination (MMSE), episodic memory, and perceptual speed are associated with an increased risk of elder abuse. In addition, we hypothesize that the degrees of association between different cognitive function domains vary across different subtypes of elder abuse.

Methods

Design and Participants

The study population consists of participants in the Chicago Health and Aging Project (CHAP), a population-based study of a geographically defined community. Details of the CHAP study design have been described previously [17]. Briefly, the study population enrolled residents aged 65 years and older in 4 adjacent neighborhoods on the south side of Chicago, after a complete census of the community area. Data collection includes an in-person interview conducted in participants' homes. The interviews include standardized questionnaires and tests for the assessment of health history, physical function, cognitive function, health behaviors and social factors. As of 2010, a total of 8,932 older adults had participated in the CHAP study. Written informed consent was obtained and the study was approved by the Institutional Review Board at Rush University Medical Center.

Elder Abuse Conceptual Framework and Definition

This study followed the conceptual framework of sociocultural context suggested by the National Research Council [6]. Elder abuse is defined as 'intentional actions that cause harm or create a serious risk of harm, whether or not intended, to a vulnerable elder by a caregiver or other person who stands in a trust relationship to the elder; or, failure by a caregiver to satisfy the elder's basic needs or to protect the elder from harm'. Three major components need to be present to constitute elder abuse: an older person, a trust relationship and vulnerability. An older person includes all persons over the age of 65 years. A trust relationship denotes a caregiving relationship or other familial relationship where a person has the responsibility of caring for or protecting the interest of an older person. Vulnerability, another core concept in elder abuse, refers to dependence on others or impaired ability for self-care or self-protection. This vulnerability refers to the cluster of risk factors (i.e. cognitive impairment) associated with an increased likelihood of elder abuse.

The sociocultural context model focuses on the comprehensive assessment of vulnerability factors, medical comorbidities, relationships and socioeconomic status inequity while considering the sociocultural context and social embeddedness in which

elder abuse takes place. This overarching model highlights the importance of these interactions created by vulnerability, especially those with cognitive impairment. Social embeddedness refers to the set of people in the social wellbeing (social network and social participation) of the older adult and trusted others who may overlap. Vulnerability factors refer to a person's physical health status (e.g. medical conditions, cognitive impairment) and psychological status (e.g. depression). The interactions among these components may potentially lead to the risk of elder abuse, while at the same time guiding the list of covariates for the proposed analyses.

Reporting of Elder Abuse

Reports of elder abuse to social services agencies can come from a variety of sources, including health care and legal professionals, social services agencies themselves, community organizations, city workers (e.g. a postal or utility worker), participants themselves, family members, or concerned neighbors or friends who have contact with seniors. In Illinois, elder abuse is only partially mandated for report, that is, reporting is mandatory only for those who are unable to report it themselves and for whom abuse has occurred within the last 12 months. Elder abuse cases are reported to Illinois Adult Protective Services through the Elder Abuse Hotline.

Definition of Elder Abuse

At Illinois Adult Protective Services the definition of abuse includes physical abuse, sexual abuse, emotional abuse, confinement, neglect, willful deprivation and financial exploitation. Physical abuse is defined as inflicting physical pain or injury upon an older adult. Sexual abuse is touching, fondling, intercourse or any other sexual activity with an older adult, when the older adult is unable to understand, unwilling to consent, threatened or physically forced. Emotional abuse involves verbal assaults, threat of abuse, harassment or intimidation. Confinement is restraining or isolating an older adult, other than for medical reasons. Neglect is a caregiver's failure to provide an older adult with life's necessities, including, but not limited to, food, clothing, shelter or medical care. Willful deprivation is willfully denying an older adult medication, medical care, shelter, food, a therapeutic device or other physical assistance, and thereby exposing that person to the risk of physical, mental or emotional harm – except when the older adult has expressed capacity to understand the consequences and intent to forgo such care. Financial exploitation includes the misuse or withholding of an older adult's resources by another, to the disadvantage of the elderly person or the profit or advantage of someone else. Confirmation of abuse is based on the number and type of indicators seen by Adult Protection Services workers.

Record Linkage

We matched data from CHAP participants to elder abuse cases reported to social services agencies from 1993 through 2010. Matching was based on an algorithm that compared the following information: date of birth, sex, race, exact home address, zip codes and the home phone number. Matching was performed twice to increase accuracy. This resulted in a total of 238 older CHAP participants who matched a social service agency record. If a CHAP participant was found to be reported more than once, we selected the first report.

Assessment of Cognitive Function

A battery of 4 different cognitive function tests was administered. The MMSE is a widely used 30-item measure of dementia severity [18]. Episodic memory was assessed using summarized scores of both immediate and delayed recall of brief stories in the East Boston Memory Test (range 0–24) [19]. The 12-item narrative questions include, for example: 'Three children were alone at home and the house caught on fire. A brave fireman managed to climb in a back window and carry them to safety. Aside from minor cuts and bruises, all were well.' Perceptual speed and attention were assessed using the 11-item oral version of the Symbol Digit Modalities Test [20], which calls for rapid perceptual comparisons of numbers and symbols during the 90 s for each item (range in this study: 0–75). To assess global cognitive function with minimal floor and ceiling artifacts, we constructed a summary measure for global cognition based on all 4 tests for the entire population, to yield a composite score for global cognitive function (range –4.31 to 1.73).

Study Variables

Elder abuse status was separated into 3 groups for the cohort (reported, confirmed and no elder abuse). Both reported elder abuse and confirmed abuse were separately compared to the reference group of no elder abuse reports. Elder abuse subtypes include physical abuse, sexual abuse, emotional abuse, financial exploitation and caregiver neglect (summary of neglect, willful deprivation and confinement). Demographic variables used in these analyses were age, sex and race. In addition, we included socioeconomic status measures of education and income. Self-reported medical conditions of hypertension, diabetes mellitus, stroke, heart disease, hip fracture and cancer were collected. Symptoms of depression were measured using a modified version [21] of the Center for Epidemiologic Studies of Depression Scale [22]. Social network was summarized as the total number of children, relatives and friends seen at least monthly [23]. Social engagement was assessed by asking how often older adults participate in social activities outside the house, such as religious activities, or at museums, libraries or senior centers.

Analytic Approach

Descriptive univariate analyses were conducted by elder abuse status across age, sex, race, education, income, medical conditions, depressive symptoms, social network and social participation. Given the number of participants in different comparison groups in our study, we used nonparametric statistics to test the difference between the groups. Specifically, we used the Wilcoxon two-sample test for the comparison of 2 groups when the measures were continuous. We also used Fisher's exact test to compare the differences in the proportions of two groups for categorical measures when the sample sizes were small. Similar procedures were used to compare the differences in the MMSE, episodic memory, perceptual speed and global cognition.

To examine the association between cognitive function and elder abuse, we used a series of logistic regression models to systematically consider potential confounding factors. The core model (model A) was adjusted for age, sex and race. The fully adjusted model (model B) included additional socioeconomic variables including education and income, the medical conditions of hypertension, heart disease, diabetes, stroke, cancer, hip fracture, depressive symptoms, social network and social participation. All

Table 1. Association between cognitive function and reported and confirmed elder abuse

	Reported elder abuse		Confirmed elder abuse	
	model A	model B	model A	model B
Global cognition	1.70 (1.48–1.96)*	1.68 (1.40–2.00)*	1.63 (1.34–1.98)*	1.58 (1.24–2.01)*
MMSE	1.06 (1.04–1.08)*	1.05 (1.03–1.08)*	1.05 (1.03–1.08)*	1.04 (1.01–1.08)***
Episodic memory	1.07 (1.05–1.10)*	1.06 (1.04–1.09)*	1.06 (1.03–1.09)*	1.05 (1.01–1.08)***
Perceptual speed	1.04 (1.03–1.05)*	1.03 (1.02–1.05)*	1.04 (1.02–1.05)*	1.03 (1.01–1.05)**

Values are ORs with 95% CIs in parentheses. Model A: age, sex, race. Model B: model A + education, income, medical conditions, depressive symptoms, social network and social participation. Bonferroni-corrected p values: * $p < 0.001$; ** $p < 0.01$; *** $p < 0.05$.

of the above models were conducted for global cognitive function, episodic memory and perceptual speed. As a sensitivity analysis we repeated all the above models for confirmed cases of elder abuse.

Moreover, all above models were repeated using tertiles of cognitive function with respect to elder abuse outcomes. Global cognition is an overall measure computed from 3 individual components of MMSE, episodic memory, and perceptual speed. Thus, for all post hoc analyses of individual components of cognitive function, we performed a Bonferroni correction of the p value divided by 3. We performed a Bonferroni correction of p value divided by 4 for the global cognition models, and p value divided by 12 for combinations of 3 components of MMSE and 4 components of elder abuse. Odds ratio (OR), 95% confidence interval (95% CI), parameter estimate, standard error and Bonferroni-adjusted p values were reported for all analyses using SAS®, version 9 (SAS Institute Inc., Cary, N.C., USA).

Results

Baseline Characteristics

The mean age of the 8,694 participants without elder abuse was 73.3 years (standard deviation = 7.2 years), and approximately 40% of this group were women. The mean age of the 238 participants with elder abuse was 76.2 years (standard deviation = 6.4 years), and approximately 76% of them were women. Overall, those with elder abuse had lower levels of education, income, a higher number of medical conditions, greater depressive symptoms, and lower levels of social network and social participation. The mean MMSE (range 0–30) for the elder abuse group was 21.9 (7.7), and the mean MMSE for the no elder abuse group was 26.2 (5.2). The mean episodic memory (range 0–24) was 12.3 (6.8) for the elder abuse group and 16.6 (5.6) for the no elder abuse group. The mean perceptual speed (range 0–75) was 18.3 (12.5) for the elder abuse group and 30.2 (14.4) for the no elder abuse group. The mean global cognition (range –4.31 to 1.73) was –0.54 (1.01) for the elder abuse group and 0.21 (0.83) for the no elder abuse group.

Cognitive Functions and Overall Elder Abuse

We constructed a series of regression models to estimate the association between cognitive function and elder abuse. To make use of all available cognitive data, we used the composite measure of global cognition in the initial analyses. In the fully adjusted model (table 1; model B), every point of lower level in global cognitive function remains a significant risk factor of elder abuse (OR 1.68, 95% CI 1.40–2.00). For MMSE, every point of lower MMSE score was significantly associated with an increased risk of elder abuse (OR 1.05, 95% CI 1.03–1.08). Every point lower in either episodic memory (OR 1.06, 95% CI 1.04–1.09) or perceptual speed (OR 1.03, 95% CI 1.02–1.05) was also significantly associated with an increased risk of elder abuse. We repeated all the above analyses for the confirmed cases of elder abuse, the results of which were similar.

Cognitive Function with Specific Types of Elder Abuse

In the fully adjusted model (table 2; model E), every point lower in global cognitive function was associated with an increased risk of physical abuse (OR 1.88, 95% CI 1.27–2.77), emotional abuse (OR 1.45, 95% CI 1.10–1.89), caregiver neglect (OR 1.91, 95% CI 1.49–2.44), and financial exploitation (OR 1.61, 95% CI 1.28–2.03). The lowest tertiles of global cognitive function were associated with an increased risk of a single type of abuse (OR 4.97, 95% CI 2.20–11.21), of 2 forms of abuse (OR 3.20, 95% CI 1.33–7.69) and of 3 or more forms of abuse (OR 4.81, 95% CI 1.45–15.91; table 3). For MMSE, the lowest tertiles of

Table 2. Association between cognitive function and specific subtypes of elder abuse

	Physical abuse		Emotional abuse		Caregiver neglect		Financial exploitation	
	OR	PE, SE	OR	PE, SE	OR	PE, SE	OR	PE, SE
Global cognition	1.88 (1.27–2.77)	0.63, 0.19**	1.45 (1.10–1.89)	0.37, 0.14***	1.91 (1.49–2.44)	0.65, 0.13*	1.61 (1.28–2.03)	0.48, 0.12*
MMSE	1.08 (1.03–1.14)	0.08, 0.03***	1.04 (1.00–1.08)	0.04, 0.02	1.07 (1.04–1.11)	0.07, 0.02*	1.04 (1.01–1.08)	0.04, 0.02
Episodic memory	1.07 (1.01–1.13)	0.07, 0.03	1.02 (0.99–1.06)	0.02, 0.02	1.08 (1.04–1.12)	0.08, 0.02*	1.05 (1.02–1.09)	0.05, 0.02***
Perceptual speed	1.04 (1.01–1.07)	0.04, 0.02	1.04 (1.02–1.06)	0.04, 0.01**	1.05 (1.02–1.07)	0.05, 0.01*	1.04 (1.02–1.06)	0.03,0.01**

Values in parentheses are 95% CIs. The model is adjusted for: age; sex; race; education; income; medical conditions; depressive symptoms; social network, and social participation. PE = Parameter estimate; SE = standard error. Bonferroni-corrected p values: * $p < 0.001$; ** $p < 0.01$; *** $p < 0.05$..

Table 3. Association between tertiles of cognitive function and specific subtypes of elder abuse

	All cases of elder abuse	Specific subtypes of elder abuse				Number of multiple types of elder abuse		
		physical abuse	emotional abuse	caregiver neglect	financial exploitation	1 type of abuse	2 types of abuse	≥3 types of abuse
Global cognition								
High	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Middle	1.98 (1.15–2.39)**	1.83 (0.56–5.98)	1.79 (0.85–3.79)	2.11 (0.88–5.06)	2.03 (1.03–3.98)	1.99 (0.87–4.57)	2.04 (0.86–4.84)	1.93 (0.58–6.42)
Low	4.18 (2.44–7.15)*	3.56 (1.08–11.67)	3.02 (1.41–6.44)***	6.24 (2.68–14.54)*	3.71 (1.88–7.32)*	4.97 (2.20–11.21)*	3.20 (1.33–7.69)***	4.81 (1.45–15.91)
MMSE								
High	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Middle	1.31 (0.81–2.11)	2.59 (0.64–10.49)	1.24 (0.61–2.54)	1.09 (0.48–2.51)	1.32 (0.73–2.40)	1.26 (0.65–2.47)	1.41 (0.63–3.15)	1.12 (0.29–4.23)
Low	2.97 (1.93–4.57)*	8.50 (2.39–30.36)***	2.96 (1.56–5.59)***	4.76 (2.43–9.30)*	2.64 (1.53–4.55)**	2.25 (1.22–4.16)	3.07 (1.49–6.34)***	5.69 (1.97–16.41)***
Episodic memory								
High	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Middle	1.53 (0.98–2.38)	0.92 (0.35–2.41)	1.26 (0.69–2.32)	2.52 (1.24–5.14)	1.27 (0.73–2.23)	1.52 (0.76–3.03)	1.82 (0.89–3.69)	1.14 (0.42–3.07)
Low	2.27 (1.49–3.43)*	1.48 (0.63–3.49)	1.47 (0.82–2.63)	3.67 (1.86–7.23)**	2.00 (1.20–3.35)	2.74 (1.46–5.13)***	1.95 (0.98–3.89)	2.01 (0.82–4.94)
Perceptual speed								
High	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Middle	1.58 (0.99–2.49)	2.02 (0.63–6.43)	2.12 (0.98–4.59)	0.95 (0.49–1.79)	1.62 (0.89–2.95)	1.44 (0.78–2.66)	2.96 (1.10–7.93)	0.87 (0.31–2.44)
Low	2.37 (1.51–3.73)*	3.49 (1.10–11.04)	3.93 (1.84–8.38)***	1.78 (0.99–3.22)	2.62 (1.45–4.72)***	1.43 (0.77–2.66)	5.83 (2.22–15.27)***	2.11 (0.80–5.59)

Values are ORs with 95% CIs in parentheses. The model is adjusted for: age; sex; race; education; income; medical conditions; depressive symptoms; social network, and social participation. Bonferroni-corrected p values: * $p < 0.001$; ** $p < 0.01$; *** $p < 0.05$.

MMSE scores are associated with an increased risk of single types of abuse (OR 2.25, 95% CI 1.22–4.16), of 2 forms of abuse (OR 3.07, 95% CI 1.49–6.34) and of 3 or more forms of abuse (OR 5.69, 95% CI 1.97–16.41).

Discussion

In this population-based study of 8,698 older people from an urban and socioeconomically diverse community, we found that even 1 point lower in global cognitive function as well as MMSE, episodic memory and perceptual speed scores were associated with an increased risk of elder abuse. In addition, the risk of elder abuse was higher for those with the lowest levels of global cognition, MMSE, episodic memory and perceptual speed. Moreover, we found that the strength of association between the cognitive function measures above and elder abuse varies by the specific subtypes of elder abuse as well as multiple forms of elder abuse.

Our findings build on the results of other studies of cognitive function and elder abuse in a number of different ways. First, our study is the largest population-based study to examine the association between cognitive function and elder abuse, demonstrating the significant association with global cognitive function, MMSE, episodic memory and perceptual speed. Second, the present study further expands our existing knowledge about the associations between levels of cognitive function domains with the specific subtypes of elder abuse as well as those who suffer multiple forms of elder abuse. Third, the MMSE is a commonly used screening test for health care

professionals and social services agencies, and it is often used to evaluate elderly adults to determine the degree of vulnerability and degree of elder abuse. This could have potentially important implications for health care professionals and social services organizations, many of whom use the MMSE as a screening tool for cognitive impairment.

The precise causal mechanisms between cognitive function and elder abuse remain unclear. We considered a series of sociodemographic characteristics, medical comorbidities, depressive symptomatology and social factors, as these factors have been associated with elder abuse [24–26]. However, adjustments for these factors did not change the relationship between cognitive function and elder abuse. Behavioral manifestations associated with severe cognitive impairment may be a factor that accounts for the association between cognitive impairment and elder abuse, but this factor was not considered in this analysis. Social support may be another intermediate factor between cognitive impairment and elder abuse. Moreover, even though it is possible that cognitive impairment may predict elder abuse, it is also conceivable that elder abuse could exacerbate the impairment in cognitive function.

Our study also has a number of limitations. First, elder abuse was not ascertained uniformly for all members of the CHAP population, but only for participants referred to the social services agency because someone suspected problems. Second, we did not have measures of other cognitive domains such as phonemic and semantic fluency and attention etc. In addition, we did not have adequate power to examine the association between Alzheimer's disease diagnosis and risk of elder abuse. Third, abused older adults with severe cognitive impairment may have behavioral and psychiatric manifestations which may increase the risk of elder abuse. Fourth, we did not have information on the potential perpetrators or responsible caregiver involved with the older adults to assess the context of elder abuse, caregiver stress or burden for the vulnerable older adults. Finally, this cross-sectional study cannot assess the temporal relation of cognitive impairment and elder abuse. Further work is needed to clarify this important issue in representative populations.

This study has important practical and policy implications [27]. For health care professionals who care for older adults, screening for elder abuse should occur alongside the screening for cognitive impairment. 'Red flags' for potential elder abuse should be raised for vulnerable, cognitively impaired individuals, especially those without the support needed to meet their most basic day-to-day needs. Health care professionals, social services agencies, law enforcement agencies, policy makers and other relevant disciplines should work closely with dementia organizations at the community, state and national levels to promote awareness of the association between cognitive impairment and elder abuse [28].

Conclusion

We conclude that lower levels of global cognitive function, MMSE, episodic memory and perceptual speed are associated with an increased risk of elder abuse. The increased risks of elder abuse are particularly high for those with lowest levels of cognitive function. Moreover, the degree of association between cognitive function and elder abuse varies by the subtypes of elder abuse as well as multiple forms of elder abuse. Future studies will also be necessary to determine the temporal relations between cognitive function and elder abuse.

Acknowledgments

The authors wish to thank the Illinois Adult Protective Services Agency case workers' effort to combat elder abuse. This work was supported by a National Institute on Aging grant (R01 AG11101 and RC4AG 039085), the Paul B. Beeson Physician Scholar Award in Aging (K23 AG030944), the Starr Foundation, John A. Hartford Foundation and the Atlantic Philanthropies.

Disclosure Statement

Drs. Dong, Simon and Evans declare no conflicts of interest.

References

1 Beach SR, Schulz R, Castle NG, Rosen J: Financial exploitation and psychological mistreatment among older adults: differences between African Americans and non-African Americans in a population-based survey. Gerontologist 2010;50:744–757.

2 Acierno R, Hernandez MA, Amstadter AB, Resnick HS, Steve K, Muzzy W, Kilpatrick DG: Prevalence and correlates of emotional, physical, sexual, and financial abuse and potential neglect in the United States: the National Elder Mistreatment Study. Am J Public Health 2010;100:292–297.

3 Dong X: Medical implications of elder abuse and neglect. Clin Geriatr Med 2005;21:293–313.

4 Dong X, Simon M, Mendes de Leon C, Fulmer T, Beck T, Hebert L, et al: Elder self-neglect and abuse and mortality risk in a community-dwelling population. JAMA 2009; 302:517–526.
5 Dong X, Simon MA, Beck T, Farran C, McCann J, , Mendes de Leon CF, Laumann E, Evans DA: Elder abuse and mortality: the role of psychological and social wellbeing. Gerontology 2010, E-pub ahead of print.
6 National Research Council: Elder Mistreatment: Abuse, Neglect and Exploitation in an Aging America. Washington, National Academies Press, 2003.
7 Lachs MS, Pillemer K: Elder abuse. Lancet 2004;364:1263–1272.
8 National Center on Elder Abuse Website: the basics. http://elderabusecenter.org/pdf/research/apsreport030703.pdf (accessed June 20, 2006).
9 Government Accountability Office Website: elder justice: stronger federal leadership could enhance national response to elder abuse. http://aging.senate.gov/events/hr230kb2.pdf (accessed 2011).
10 Coyne AC, Reichman WE, Berbig LJ: The relationship between dementia and elder abuse. Am J Psychiatry 1993;150:643–646.
11 Paveza GJ, Cohen D, Eisdorfer C, Freels S, Semla T, Ashford JW, et al: Severe family violence and Alzheimer's disease: prevalence and risk factors. Gerontologist 1992;32:493–497.
12 Pillemer K, Suitor JJ: Violence and violent feelings: what causes them among family caregivers? J Gerontol 1992;47:165–172.
13 Homer AC, Gilleard C: Abuse of elderly peopole by their careers. Br Med J 1990;301: 1359–1362.
14 Cooper C, Selwood A, Blanchard M, Walker Z, Blizard R, Livingston G: Abuse of people with dementia by family carers: representative cross sectional survey. BMJ 2009; 338:b155.
15 Wiglesworth A, Mosqueda L, Mulnard R, Liao S, Gibbs L, Fitzgerald W: Screening for abuse and neglect of people with dementia. J Am Geriatr Soc 2010;58:493–500.
16 Lachs MS, Williams C, O'Brien S, Hurst L, Horwitz R: Risk factors for reported elder abuse and neglect: a nine-year observational cohort study. Gerontologist 1997;37:469–474.
17 Bienias JL, Beckett LA, Bennett DA, Wilson RS, Evans DA: Design of the Chicago Health and Aging Project (CHAP). J Alzheimers Dis 2003;5:349–355.
18 Folstein MF, Folstein SE, McHugh PR: 'Mini-mental state'. A practical method for grading the cognitive state of patients for the clinician. J Psychiatr Res 1975;12:189–198.
19 Albert M, Smith LA, Scherr PA, Taylor JO, Evans DA, Funkenstein HH: Use of brief cognitive tests to identify individuals in the community with clinically diagnosed Alzheimer's disease. Int J Neurosci 1991;57:167–178.
20 Smith A: Symbol Digit Modalities Test Manual (Revised). Los Angeles, Western Psychological Services, 1982.
21 Kohout FJ, Berkman LF, Evans DA, Cornoni-Huntley J: Two shorter forms of the CES-D (Center for Epidemiological Studies Depression) depression symptoms index. J Aging Health 1993;5:179–193.
22 Radloff L: The CES-D Scale: a self-report depression scale for research in the general population. App Psychol Meas 1977;1:385–401.
23 Cornoni-Huntley J, Brock DB, Ostfeld A, Taylor JO, Wallace RB: Established Populations for Epidemiological Studies of the Elderly Resource Data Book. NIH Publ No 86-2443. Washington, US Department of Health and Human Services, 1986.
24 Dong X, Simon MA, Odwazny R, Gorbien MJ: Depression and elder abuse and neglect among a community-dwelling Chinese elderly population. J Elder Abuse Negl 2008; 20:25–41.
25 Dong X, Beck TT, Simon MA: Loneliness and mistreatment of older Chinese women: does social support matter? J Women Aging 2009;21:293–302.
26 Dong X, Simon MA: Is impairment in physical function associated with increased risk of elder mistreatment? Public Health Rep 2010; 125:743–753..
27 Dong X, Simon MA: Enhancing national policy and programs to address elder abuse. JAMA 2011;305:2460–2461.
28 Mosqueda L, Dong X: Elder abuse and self-neglect: 'I don't care anything about going to the doctor to be honest...'. JAMA 2011;306: 532–540.