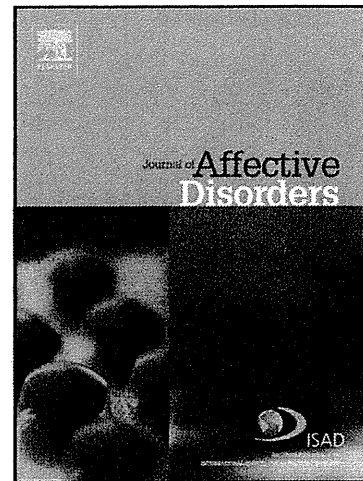


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Suicidal ideation and related factors among dementia patients

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ABSTRACT

Background: It is generally thought that people with dementia are not able to attempt suicide because of impaired executive function. Little research is available about suicidal ideation among dementia patients. The present study examines 1) the sociodemographic and clinical features of dementia patients with suicidal ideation and 2) the effect of suicidal ideation on caregiver burden.

Methods: A total of 634 dementia outpatients and their family caregivers participated in this study. Comparisons of variables were made among three groups: patients with suicidal ideation, patients with depression without suicidal ideation, and patients with neither suicidal ideation nor depression. Data were collected between April 2007 and July 2013.

Results: Suicidal ideation was seen in 64 patients (10.1%). Patients with suicidal ideation had a significantly higher rate of behavioural and psychological symptoms of dementia (BPSD) ($P < 0.001$). Caregivers of patients with suicidal ideation felt a higher caregiver burden, even after adjusting for BPSD score ($P < 0.01$).

Limitations: Suicidal ideation was assessed by interview with caregivers, so we may have overlooked people who had suicidal ideation but did not express it to their caregivers.

Conclusions: Suicidal ideation among dementia patients should receive greater attention. Adequate assessment of suicidal ideation and psychological support for both patients with suicidal ideation and their caregivers are needed.

Accepted manuscript

1. Introduction

Dementia is a worldwide problem affecting 44.4 million people.(International Alzheimer's Disease, 2013) Among dementia patients, depression is one of the major neuropsychiatric symptoms.(Pellegrino et al., 2013) Considering that depression sometimes leads to suicidal ideation, it is possible that some dementia patients have suicidal ideation or actually attempt suicide. However, it is generally thought that people with dementia are not able to attempt suicide because of impaired executive function. Haw et al.(Haw et al., 2009) reviewed the relation between dementia and suicidal behaviour and concluded that the relation is unclear. Therefore, suicidality among patients with dementia has received little attention. To date, some researchers have reported a higher rate of suicide among dementia patients, especially for patients with newly diagnosed dementia(Draper et al., 2010; Erlangsen et al., 2008; Lim et al., 2005; Mizukami et al., 2009; Seyfried et al., 2011) or those with specific types of dementia, such as semantic dementia.(Hsiao et al., 2013; Sabodash et al., 2013) Rubio et al. (Rubio et al., 2001)also reported increased Alzheimer pathology in a population of elderly people committing suicide compared with subjects who died of natural causes. Considering that elderly people generally have a higher risk of suicide(Draper, 2014) and that dementia is frequently associated with depression,(Bennett and Thomas,

2014) the issue of suicidality among dementia patients should not be thought of lightly. Most previous studies about suicidality among dementia patients focused on suicidal behaviour, and suicidal ideation was rarely discussed. Having suicidal ideation, which is one of the most important risk factors for suicidal behavior, (Almeida et al., 2012) would not only decrease patients' quality of life (QOL) but also affect caregivers. Based on the findings that caregivers of dementia patients with depression felt burdened more than those of dementia patients without depression, (Kang et al., 2014); (Mohamed et al., 2010) we hypothesized that caring for dementia patients with suicidal ideation would be more stressful for caregivers.

This paper clarifies 1) the sociodemographic and clinical features of dementia patients with suicidal ideation and 2) the effect of suicidal ideation on caregiver burden.

2. Methods

2.1. Participants

This study was approved by the Human Ethics Review Committee of Kumamoto University. After a complete description of all procedures of the study was provided, written informed consent was obtained from patients and their family

caregivers.

Participants in this study were outpatients of the Dementia Clinic of the Department of Neuropsychiatry, Kumamoto University Hospital, from April 2007 to July 2013. Inclusion criteria was 1) provision of written informed consent; 2) diagnosed with Alzheimer's disease (AD), vascular dementia (VaD), dementia with Lewy bodies (DLB), or frontotemporal lobar degeneration (FTLD); 3) living at home, that is, not in a nursing home; and 4) both the patient and his/her main caregiver could participate in our survey. Patients who fulfilled the above criteria ($n = 634$) were examined by senior neuropsychiatrists with adequate experience with patients with dementia. All patients had undergone routine laboratory tests, neuroimaging studies such as magnetic resonance imaging and single-photon emission computed tomography, and standard neuropsychological examinations. Dementia was diagnosed according to the Diagnostic and Statistical Manual of Mental Disorders, 3rd edition-revised (APA, 1987). Patients were divided into those with probable AD, defined according to the National Institute for Neurological and Communicative Disorders and Stroke-Alzheimer's disease and Related Disorders Association (McKhann et al., 1984); probable VaD, defined according to the National Institute for Neurological Disorders and Stroke-Association Internationale pour la Recherche et l'Enseignement en

Neurosciences criteria (Román et al., 1993); probable DLB, defined according to the Consensus Criteria for the clinical diagnosis of DLB, 2005 (McKeith et al., 2005); or probable FTLD, defined according to the Consensus Criteria for the clinical diagnosis of FTLD. (Neary et al., 1998)

2.2. Measures

Suicidal ideation and depression. We used a domain of the Japanese version of the Neuropsychiatric Inventory (NPI) to assess suicidal ideation and objective depression. (Cummings et al., 1994; Hirono et al., 1997) The NPI, which is a semi-structured interview with a caregiver of patients, consists of ten behavioural domains including Depression/Dysphoria. For each domain, several subquestions are explored. For suicidal ideation, we regarded an answer of “yes” to the subquestion of the domain of Depression/Dysphoria, “Does the patient express a wish for death or talk about killing himself/herself?” as “having suicidal ideation”.

Behavioural and Psychological Symptoms of Dementia (BPSD): NPI were used to assess BPSD. (Cummings et al., 1994; Hirono et al., 1997) Besides Depression/Dysphoria above, we evaluated the domains of Hallucinations, Delusions, Agitation/aggression, Anxiety, Euphoria, Apathy, Disinhibition, Irritability/lability,

and Aberrant motor behaviour. The score of each domain was calculated by frequency (1=less than once a week, 2=once a week, 3=a few times a week, 4=once a day or more) × severity (1=mild, 2=moderate, 3=severe), and we regarded the sum of all scores of each domain excluding Depression/Dysphoria as the NPI total score (range, 0-108). Higher scores indicate worse conditions.

Caregiver burden. The Japanese version of the Zarit Caregiver Burden Interview (J-ZBI)(Arai et al., 1997)(Zarit et al., 1980) was used. ZBI consists of 22 questions about the impact of the patient's disabilities on the lifestyle of the caregiver. The questions were aimed at eliciting information regarding areas most frequently mentioned by caregivers as problematic, including caregiver health, psychological well-being, finances, social life, and the relationship between the caregiver and recipient of care. For each item, caregivers indicate how often they feel that way (never=0, rarely=1, sometimes=2, quite frequently=3, nearly always=4). The sum of scores ranges from 0 to 88, and higher scores indicate higher burden.

Severity of dementia and cognitive function: The severity of dementia was assessed using the Clinical Dementia Rating (CDR) scale.(Morris, 1993) It is a 5-point scale used to characterize six domains of cognitive and functional performance: Memory, Orientation, Judgment & Problem Solving, Community Affairs, Home & Hobbies, and

Personal Care. Based on these domains, an overall CDR score is calculated. The overall CDR assigns cognitive function to five levels: no dementia, CDR 0; questionable dementia, CDR 0.5; mild dementia, CDR 1; moderate dementia, CDR 2; or severe dementia, CDR 3. The Mini-Mental State Examination (MMSE) was used to assess cognitive function. (Folstein et al., 1975) MMSE is one of the most widely used cognitive screening tests that quantitatively assesses the severity of cognitive function. Scores range from 0 to 30, with higher scores indicating better cognitive functioning.

Other variables. Sociodemographic and clinical variables included age, gender, way of living (living alone, living with family), age of dementia onset (younger than 65 years, aged 65 years and older), and duration of illness.

2.3. Statistical Analysis

Participants were divided into three groups: the suicidal ideation group (SI+), the no suicidal ideation with depression group (SI-/Dep+), and the neither suicidal ideation nor depression group (SI-/Dep-). Demographic and clinical factors were compared among groups using one-way analysis of variance and Bonferroni's post-hoc test. To compare caregiver burden among the three groups, we conducted one-way analysis of covariance adjusting for NPI total score (except for the

Depression/Dysphoria score), which is strongly related to caregiver burden. (Ornstein and Gaugler, 2012) All tests were two-tailed and the significance levels were set at $p < 0.05$. All statistical analyses were performed with SPSS 21.0J for Windows (IBM SPSS Japan, Tokyo, Japan).

3. Results

Of 634 subjects, suicidal ideation was seen in 64 (10.1%). Of 570 subjects who did not have suicidal ideation, 133 (21.0%) had depression (SI-/Dep+ group), and 437 (68.9%) did not (SI-/Dep- group). Table 1 shows demographic and clinical characteristics of groups. The percentage of females was significantly higher in the SI+ and SI-/Dep+ groups than the SI-/Dep- group. Early-onset participants (younger than 65 years) had a significantly higher rate of SI-/Dep+ than late-onset participants and a significantly lower rate of SI-/Dep-. NPI total score except for the Depression/Dysphoria score was significantly lower in the SI-/Dep- group than in the SI+ and SI-/Dep+ groups. There were no significant differences among groups in age, duration of illness, diagnoses, severity of dementia, way of living, and cognitive function.

[Insert Table1 here]

Table 2 shows BPSD symptoms. Symptoms that were significantly more

severe in the SI+ group than in the SI-/Dep+ and SI-/Dep- groups were delusions, agitation/aggression, and anxiety. Apathy and irritability/lability were significantly worse in the SI+ group than in the SI-/Dep- group, but were not worse than in the SI-/Dep+ group. Depression/ Dysphoria was significantly worse in the SI+ group than in the SI-/Dep+ group.

[Insert Table2 here]

In terms of caregiver burden (Table 3), the SI+ group had a significantly higher burden than the SI-/Dep+ and SI-/Dep- groups. After adjusting for NPI total score (except for the Depression/Dysphoria score), the difference was not significant between the SI+ and SI-/Dep+ groups, but the SI+ group had a significantly higher burden than the SI-/Dep- group.

[Insert Table3 here]

4. Discussion

The present study was the first to show a prevalence of suicidal ideation among dementia patients and the relationship between suicidal ideation and other factors. In our study, a total of 10.1% of dementia patients had suicidal ideation, the number of which is somewhat higher than that of community-dwelling older people.

Almeida et al. reported that 4.8% of community-dwelling older people aged 60 years and older acknowledged suicidal ideation.(Almeida et al., 2012) Although the prevalence of suicidal ideation is reported to decrease with advancing age,(Nock et al., 2008) suicidal ideation might not be a rare feeling in the last stage of life. Fässberg et al. reported that 11.8% of elderly people aged 97 years old without dementia had some levels of suicidal ideation but that most of them did not fulfil the criteria for depression.(Fässberg et al., 2013) Comparisons of the prevalence of suicidal ideation between dementia patients and normal controls are needed in future studies.

Our study revealed that age, gender, and way of living were not related to suicidal ideation. In addition, suicidal ideation was observed regardless of diagnosis, severity, and cognitive function, which is inconsistent with some previous studies that reported a higher risk of suicidal behaviour in early stages of dementia or with a new dementia diagnosis.(Lim et al., 2005; Seyfried et al., 2011) This inconsistency might be explained by the difference between suicidal ideation and suicidal behaviour, although suicidal ideation is one of the most important risk factors of suicidal behavior.(Almeida et al., 2012) Our results suggest the importance of paying attention to suicidal ideation in every stage and type of dementia.

The dementia patients with suicidal ideation had worse BPSD. In particular,

delusion, agitation/aggression, and anxiety were more frequently seen in patients with suicidal ideation than those without suicidal ideation. Although some previous studies examined the effect of BPSD on patients' quality of life, consistent results have not been obtained thus far. (Naglie et al., 2011) However, our results indicate the association between BPSD and suicidal ideation. Some dementia patients with behavioural disturbances might feel uncomfortable about these symptoms, or others may be distressed about the relationship with caregivers over these symptoms.

Patients with suicidal ideation were more depressed than those with depression but accompanying suicidal ideation, which indicates that the severity of depression is associated with suicidal ideation among dementia patients as is the case with the common depression.

Our results showed higher caregiver burden of patients with suicidal ideation. Higher caregiver burden of patients with suicidal ideation was reported in a previous study targeted at bipolar patients. (Chessick et al., 2007) Caring for people who have suicidal ideation might be highly stressful for caregivers regardless of disease. Caregiver burden has been pointed out to be associated with poor outcomes of caregivers such as depression, physical illness, and decreased QOL, along with poor outcomes of dementia patients, such as poor QOL and early nursing home

placement. (Etters et al., 2008) A recent study also reported a significant prevalence of suicidal ideation in caregivers of patients with dementia. (O'Dwyer et al., 2013)

Psychological support for caregivers of dementia patients with suicidal ideation and care support for patients is needed to alleviate burden.

4.1. Limitations

A major strength of our study is that we clarified the prevalence of and factors related to suicidal ideation among clinical dementia in a large sample. However, some limitations must be considered when interpreting these results. First, we assessed patients' suicidal ideation from the caregivers' interview, so we may have overlooked people who had suicidal ideation but did not express it to their caregivers. Therefore, the prevalence rate of suicidal ideation among our sample of dementia patients might be underestimated. Second, we could not assess the seriousness of suicidal ideation. Third, we dealt with suicidal ideation, not with suicidal attempts. Fourth, we targeted only AD, VaD, DLB, and FTLD and did not examine other minor diseases underlying dementia because the number of each disease was not high enough for statistical analysis.

Although dementia patients are thought to lack insight, it is possible that

they are often vaguely aware of their unusual changes after the onset of dementia and lose confidence or feel anxiety. As a result, they might become socially isolated, coupled with apathetic symptoms. Considering that social isolation is reported to be a strong risk factor for suicide in the elderly,(Almeida et al., 2012; Draper, 2014) providing opportunities for going out and communicating with others may be important from the aspect of suicide prevention.

4.2. Conclusions and clinical implications

In conclusion, about 10% of dementia patients had suicidal ideation, regardless of diagnosis, severity, and cognitive function. Caring for dementia patients who have both suicidal ideation and depression was highly burdensome for caregivers. It is important to assess dementia patients' suicidal ideation, expressed or not, adequately and to provide psychological support and as-needed treatment for depression.

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Declaration of interest

None.

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REFERENCES

- Almeida, O.P., Draper, B., Snowden, J., Lautenschlager, N.T., Pirkis, J., Byrne, G., Sim, M., Stocks, N., Flicker, L., Pfaff, J.J., 2012. Factors associated with suicidal thoughts in a large community study of older adults. *Br. J. Psychiatry* 201, 466–72. doi:10.1192/bjp.bp.112.110130
- APA, 1987. *Diagnostic and Statistical Manual of Mental Disorders, Third Edition, Revised*. American Psychiatric Association. doi:10.1007/SpringerReference_69770
- Arai, Y., Kudo, K., Hosokawa, T., Washio, M., Miura, H., Hisamichi, S., 1997. Reliability and validity of the Japanese version of the Zarit Caregiver Burden interview. *Psychiatry Clin. Neurosci.* 51, 281–287.
- Bennett, S., Thomas, A.J., 2014. Depression and dementia: Cause, consequence or coincidence? *Maturitas* 79, 184–190. doi:10.1016/j.maturitas.2014.05.009
- Chessick, C.A., Perlick, D.A., Miklowitz, D.J., Kaczynski, R., Allen, M.H., Morris, C.D., Marangell, L.B., 2007. Current suicide ideation and prior suicide attempts of bipolar patients as influences on caregiver burden. *Suicide Life. Threat. Behav.* 37, 482–491. doi:10.1521/suli.2007.37.4.482
- Cummings, J.L., Mega, M., Gray, K., Rosenberg-Thompson, S., Carusi, D.A., Gornbein, J., 1994. The Neuropsychiatric Inventory: comprehensive assessment of psychopathology in dementia. *Neurology* 44, 2308–2314. doi:10.1212/WNL.44.12.2308
- Draper, B., Peisah, C., Snowden, J., Brodaty, H., 2010. Early dementia diagnosis and the risk of suicide and euthanasia. *Alzheimer's Dement.* 6, 75–82. doi:10.1016/j.jalz.2009.04.1229
- Draper, B.M., 2014. Suicidal behaviour and suicide prevention in later life. *Maturitas* 2–6. doi:10.1016/j.maturitas.2014.04.003
- Erlangsen, A., Zarit, S.H., Conwell, Y., 2008. Hospital-diagnosed dementia and suicide: a longitudinal study using prospective, nationwide register data. *Am. J. Geriatr. Psychiatry* 16, 220–228. doi:10.1097/JGP.0b013e3181602a12

- Etters, L., Goodall, D., Harrison, B.E., 2008. Caregiver burden among dementia patient caregivers: a review of the literature. *J. Am. Acad. Nurse Pract.* 20, 423–8. doi:10.1111/j.1745-7599.2008.00342.x
- Fässberg, M.M., Ostling, S., Börjesson-Hanson, A., Skoog, I., Wærn, M., 2013. Suicidal feelings in the twilight of life: a cross-sectional population-based study of 97-year-olds. *BMJ Open* 3. doi:10.1136/bmjopen-2012-002260
- Folstein, M.F., Folstein, S.E., McHugh, P.R., 1975. “Mini-mental state”. A practical method for grading the cognitive state of patients for the clinician. *J. Psychiatr. Res.* 12, 189–198. doi:0022-3956(75)90026-6 [pii]
- Haw, C., Harwood, D., Hawton, K., 2009. Dementia and suicidal behavior: a review of the literature. *Int. Psychogeriatr.* 21, 440–453. doi:10.1017/S1041610209009065
- Hirono N, Mori E, Ikejiri Y, Imamura T, Shimomura T, Hashimoto M, Yamashita H, I.M., 1997. [Japanese version of the Neuropsychiatric Inventory: a scoring system for neuropsychiatric disturbances in dementia patients] (Japanese). *No to Shinkei* 49, 266–271.
- Hsiao, J.J., Kaiser, N., Fong, S.S., Mendez, M.F., 2013. Suicidal behavior and loss of the future self in semantic dementia. *Cogn. Behav. Neurol.* 26, 85–92. doi:10.1097/WNN.0b013e31829c671d
- International Alzheimer’s Disease, 2013. The global impact of dementia 2013–2050. doi:10.1037/e508352011-001
- Kang, H.S., Myung, W., Na, D.L., Kim, S.Y., Lee, J.-H., Han, S.-H., Choi, S.H., Kim, S., Kim, S., Kim, D.K., 2014. Factors associated with caregiver burden in patients with Alzheimer’s disease. *Psychiatry Investig.* 11, 152–9. doi:10.4306/pi.2014.11.2.152
- Lim, W.S., Rubin, E.H., Coats, M., Morris, J.C., 2005. Early-stage Alzheimer disease represents increased suicidal risk in relation to later stages. *Alzheimer Dis. Assoc. Disord.* 19, 214–9.

- McKeith IG, Dickson DW, Lowe J, Emre M, O'Brien JT, Feldman H, et al., 2005. Diagnosis and management of dementia with Lewy bodies: third report of the DLB Consortium. *Neurology* 65, 1863–1872.
- McKhann, G., Drachman, D., M, F., R, K., D, P., E, S., 1984. Clinical diagnosis of Alzheimer's disease: report of the NINCDS-ADRDA Work Group under the auspices of Department of Health and Human Services Task Force on Alzheimer's Disease. *Neurology* 34, 939–944.
- Mizukami, K., Hatanaka, K., Tanaka, Y., Sato, S., Asada, T., 2009. Therapeutic effects of the selective serotonin noradrenaline reuptake inhibitor milnacipran on depressive symptoms in patients with Alzheimer's disease. *Prog. Neuropsychopharmacol. Biol. Psychiatry* 33, 349–52. doi:10.1016/j.pnpbp.2008.12.019
- Mohamed, S., Rosenheck, R., Lyketsos, C.G., Schneider, L.S., 2010. Caregiver burden in Alzheimer disease: cross-sectional and longitudinal patient correlates. *Am. J. Geriatr. Psychiatry* 18, 917–927. doi:10.1097/JGP.0b013e3181d5745d
- Morris, J.C., 1993. The Clinical Dementia Rating (CDR): current version and scoring rules. *Neurology* 43, 2412–2414. doi:10.1212/WNL.43.11.2412-a
- Naglie, G., Hogan, D.B., Krahn, M., Beattie, B.L., Black, S.E., Macknight, C., Freedman, M., Patterson, C., Borrie, M., Bergman, H., Byszewski, A., Streiner, D., Irvine, J., Ritvo, P., Comrie, J., Kowgier, M., Tomlinson, G., 2011. Predictors of patient self-ratings of quality of life in Alzheimer disease: cross-sectional results from the Canadian Alzheimer's Disease Quality of Life Study. *Am. J. Geriatr. Psychiatry* 19, 881–90. doi:10.1097/JGP.0b013e3182006a67
- Neary, D., Snowden, J.S., Gustafson, L., Passant, U., Stuss, D., Black, S., Freedman, M., Kertesz, A., Robert, P.H., Albert, M., Boone, K., Miller, B.L., Cummings, J., Benson, D.F., 1998. Frontotemporal lobar degeneration: a consensus on clinical diagnostic criteria. *Neurology* 51, 1546–1554. doi:10.1212/WNL.51.6.1546
- Nock, M.K., Borges, G., Bromet, E.J., Alonso, J., Angermeyer, M., Beautrais, A., Bruffaerts, R., Chiu, W.T., de Girolamo, G., Gluzman, S., de Graaf, R., Gureje, O., Haro, J.M., Huang, Y., Karam, E., Kessler, R.C., Lepine, J.P., Levinson, D., Medina-Mora, M.E., Ono, Y., Posada-Villa, J., Williams, D., 2008. Cross-national