ORIGINAL ARTICLES

Violent Patient Behavior Is Associated with Bodily Pain and a High Burden on Informal Caregivers

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BACKGROUND: There have been no studies of the relationship between violent behavior by older patients and the physical and mental health of caregivers.

OBJECTIVE: To evaluate the influence of violent behavior in vulnerable elderly patients on bodily pain and caregiver burden in their informal caregivers.

DESIGN: Cross-sectional study.

SUBJECTS: One hundred thirty-seven patients aged ≥ 40 years old with limited activity and mobility in ten facilities providing home-care services in Japan.

MEASUREMENTS: Degree of caregiver-perceived violent patient behavior and caregivers' bodily pain derived from a self-administered questionnaire, and caregiver burden assessed using scores from both the Burden Index of Caregivers and the Zarit Burden Interview.

RESULTS: The mean age of the 137 patients enrolled in this study was 80.9 years. Of these patients, 31.4% were men, and 34.3% had violent behavior. The mean caregiver age was 65.0 years, and 29.2% were men. Caregivers who looked after violent patients experienced significantly higher odds of having bodily pain [AOR=3.51; 95% confidence interval (CI): 1.81 to 6.85]. Caregivers of violent patients also reported significant caregiver burden as assessed by the Burden Index of Caregivers (β -coefficient = 4.92; 95% CI: 1.95 to 7.88) and the Zarit Burden Interview (β -coefficient = 5.81; 95% CI: 2.92 to 8.70).

CONCLUSIONS: Violent behavior among older patients is associated with significant increases in both physical and psychological burden in their informal caregivers.

KEY WORDS: violent behavior; bodily pain; caregiver burden; informal caregivers.

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INTRODUCTION

Aggression is a common behavior among elderly patients with dementia¹ and often leads to placement of these patients in long-term care facilities.² Violent behavior is a psychiatric complication brought on by neurological disease in vulnerable older patients.³ While violent behavior can develop in formerly genial individuals as the result of brain damage from stroke or other age-related complications, recent reports suggest that stroke victims are more likely to exhibit violent outbursts and acts of aggression if they have concomitant cognitive impairment and depressive symptoms.^{4,5}

Caring for violent patients can be taxing, exhausting informal caregivers both physically and mentally.⁶ Caregiver burden must be measured from various angles to fully capture the multidimensional relationship between caregiver burden and health status of both patient and caregiver.^{7,8} Caregiver burden was originally defined by Zarit as the extent to which caregivers perceive that their emotional or physical health, social life, and financial status are suffering as a result of caring for their charges.^{9,10} Several studies reveal a relationship between caregiver burden and the characteristics of patients with various diseases,^{11,12} such as severe cognitive impairment.¹³

In addition to caregiver burden, caregivers subjected to violent patient behavior may experience increased pain. Bodily pain is a complex symptom resulting not only from physical impairment, but also psychiatric distress.¹⁴ When present, pain considerably diminishes the quality of life.^{15,16} Recent reports suggest that the greater the caregiver burden, the more likely caregivers are to experience bodily pain.⁸ However, the extent to which caring for vulnerable older patients with violent behavior is associated with both physical and psychological burden in informal caregivers has not been well investigated.

Using scores from self-administered questionnaires including the Burden Index of Caregivers and the short version of the Japanese version of the Zarit Burden Interview, we investigated the relationship between caring for vulnerable, violent older patients and both bodily pain and caregiver burden in informal caregivers, based on data from a multicenter survey of vulnerable home-care patients in Japan.

METHODS

Study Subjects

Potential subjects included 801 older patients in ten home-care service facilities located in Kyoto, Japan. Participation

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was limited to vulnerable patients with limited activity or mobility (either activity or mobility score of 1 or 2 on the Braden scale) who were cared for at home by a relative. We excluded patients who had attempted suicide, and patients aged less than 40 years were also eliminated, as Japanese health-care insurance covers those aged 40 years or more. A caregiver was defined as the patient's relative who most frequently provided informal care. This study was approved by the institutional review board of Kyoto University in Kyoto, Japan.

Data Collection

Data regarding patient age, comorbidity and degree of limitation of activity and mobility were derived from medical records. Informal caregivers assessed 3-month patient violent behaviors or aggression using a five-point Likert scale rating violent behavior as present "none of the time," "a little of the time," "some of the time," "most of the time" or "all of the time." We dichotomized these responses into no violent behavior, indicated by responses of "none of the time" versus any violent behavior. To assess potential dose response relationships, we recategorized the responses into three levels: no violent behavior, violent behavior "a little of the time" and violent behavior "some" or "all of the time."

Caregivers' bodily pain was assessed using a six-point Likert scale to represent degree of pain as "none," "very mild," "mild," "moderate," "severe" and "very severe" over the previous 4 weeks. We dichotomized this into "none" and "very mild" versus "mild" to "very severe."

Caregiver burden was assessed using two instruments, the recently validated 11-item Burden Index of Caregivers⁸ and the 22-item Zarit Burden Interview.¹⁰ The Burden Index of Caregivers is designed to enable precise measurement of the particular circumstances found in Japanese care settings with its two novel domains, "service-related burden" and "existential burden," in addition to general inquiries about burden of care. Additionally, we used the short version of the Japanese version of the Zarit Burden Interview, an eight-item questionnaire validated with the full version of the Zarit Burden Interview.^{10,17} For both scales, higher scores represent greater caregiver burden.

Statistical Methods

Multivariable logistic regression analysis was carried out to examine the relationship between the degree of violent behavior in patients and bodily pain experienced by caregivers. These models were adjusted to account for potential confounders including patient age and gender, caregiver gender, relationship between patient and caregiver, duration of care and presence of Alzheimer-type dementia. These confounders were selected a priori based on previous studies regarding home care and caregiver burden.^{12,13} Multivariable logistic regression analysis was employed to examine the relationship between violent patient behavior and bodily pain experienced by caregivers, with adjustment for caregiver burden assessed using Burden Index of Caregivers and the potential confounders described above. In this model, the Burden Index of Caregivers was recoded by tertiles.

In addition, we conducted multivariable linear regression analysis to examine the relationship between the state of violent

behavior and the caregiver burden score as derived from the Burden Index of Caregivers and the Zarit Burden Interview, with adjustments for possible confounders mentioned above.

Student's *t*-test and chi-square test were used for univariate analyses. To calculate trend *P*-values, the nonparametric test for trend across ordered groups was performed. Models included adjustment for clustering by facility. All analyses were performed using STATA version 9.2 (StataCorp LP, College Station, TX).

RESULTS

Of the 178 patients who met inclusion criteria, 28 declined enrollment, and 13 did not complete the questionnaire, leaving 137 subjects (77.0%).

The mean patient age was 80.9 years, 31.4% were men, and 34.3% exhibited violent behavior (Table 1). Caregivers averaged 65.0 years, 29.2% were men, the mean duration of caregiving was 6.58 years, and 36.5% had bodily pain.

Relationship Between Violent Patient Behavior, Caregiver Burden and Bodily Pain of Informal Caregivers

Caregivers of patients with violent behavior reported bodily pain 56.5% of the time, compared with 26.7% among caregivers of patients without violent behavior. (OR=3.58; 95% CI: 1.59 to 8.08). This greater than three-fold increased odds of having bodily pain persisted after adjustment for potential confounders (AOR=3.51; 95% CI: 1.81 to 6.85). There was a

Table 1. Patient and Caregiver Characteristics Classified by the Presence of Violent Behavior in Patients*

	With violent behavior (n=47)	Without violent behavior (n=90)	P- value
Patient age, years	81.6 (13.0)	80.5 (11.0)	0.60
Patient gender, % male	27.7	33.3	0.50
Caregiver age, years (SD)	64.7 (9.1)	65.1 (10.5)	0.84
Caregiver gender, % male	27.7	30.0	0.77
Caregiver relationship with patient, %			
Spousal	34.0	37.7	0.67
Filial	53.1	46.7	0.47
Duration of caregiving, years (SD)	7.51 (5.62)	6.08 (5.02)	0.13
Estimated time allotted for care daily, hours	7.59 (5.30)	7.22 (6.22)	0.74
Other familial support more than 3 times per week, %	32.6	29.9	0.75
Weekly use of home care services, days (SD)	3.44 (2.26)	3.49 (2.38)	0.89
Alzheimer-type dementia, %	21.3	11.1	0.11
Other neurodegenerative disorder, %	17.0	11.1	0.33
Bodily pain reported, %	56.5	26.7	<0.001
Score for Burden Index of Caregivers (SD)	20.5 (7.90)	15.5 (6.58)	<0.001
Score for Zarit Burden Interview (SD)	14.3 (7.28)	8.02 (7.28)	<0.001

stepwise increase in the odds of reporting bodily pain with higher degrees of violence (Fig. 1).

In addition, individuals reporting higher caregiver burden had increased odds of experiencing bodily pain. Those in the first tertile had AOR of 1.03 (95% CI: 0.39–2.73) compared with 3.95 (95% CI: 1.21–12.90) in the second or third tertile (Table 2). Also, violent patient behavior was associated with bodily pain in the model (AOR=2.88, 95% CI: 1.43–5.78).

Relationship Between Violent Patient Behavior and Caregiver Burden

Caregivers of violent patients reported a greater burden as measured by both the Burden Index of Caregivers (20.5 vs. 15.5, $P<0.001$) and the Zarit Burden Interview (14.3 vs. 8.0, $P<0.001$). Adjustment for potential confounders had little effect on the increased Burden Index (β -coefficient = 4.92, 95% CI: 1.95 to 7.88, adjusted $r^2=10.3\%$) or Zarit Index (β -coefficient = 5.81; 95% CI: 2.92 to 8.70, adjusted $r^2=17.6\%$). There was a stepwise increase in caregiver burden as violence exposure increased, from a score of 15.5 among patients with no violence to 17.5 to those with moderate violence to 23.4 among patients with severe violence (P for trend < 0.001 , Fig. 2).

DISCUSSION

Informal caregivers reported greater bodily pain when caring for patients with violent behavior or when the burden of caregiving is increased. Besides, our results showed that

Table 2. Factors Associated with Bodily Pain Experienced by Caregivers Using Multivariable Logistic Regression Models*

	AOR (95% CI)
Violent patient behavior (vs. no)	2.88 (1.43–5.78)
Burden Index of Caregivers, second tertile (vs. first tertile)	1.03 (0.39–2.73)
Burden Index of Caregivers, third tertile (vs. first tertile)	3.95 (1.21–12.90)

*Adjusted for patient age and gender, caregiver gender, relationship between patient and caregiver, duration of care and presence of Alzheimer-type dementia

violent patient behavior was associated with bodily pain even after adjustment for caregiver burden. Our results also demonstrated that increased violent patient behavior increased caregiver burden. This relationship was consistent using either the Burden Index of Caregivers or Zarit Burden Interview. In addition, we found a dose-dependent relationship with a gradual increase in burden and bodily pain associated with increased levels of exposure to violence.

While several reports have examined abuse of elderly patients by their informal caregivers, few have examined the effects of patient violent behaviors on caregiver health.¹⁸ The number of older patients requiring home care by their families is increasing as a result of an overall aging population.^{19,20} One recent report suggested that a greater burden on informal caregivers is associated with an increase in risk of death²¹, necessitating a society-wide approach to determining the burden placed upon informal caregivers.

Figure 1. The adjusted odds ratio of caregivers reporting bodily pain classified by degree of violent patient behavior (vs. caregivers with non-violent patients)*. *Adjusted for patient age and gender, caregiver gender, relationship between patient and caregiver, duration of care and presence of Alzheimer-type dementia.

Figure 2. The β -coefficients of scores for the Burden Index of Caregivers classified by degree of violent patient behavior (vs. caregivers with non-violent patients)*. *Adjusted for patient age and gender, caregiver gender, relationship between patient and caregiver, duration of care and presence of Alzheimer-type dementia.

Our study reveals that that a considerable number of informal caregivers were suffering from bodily pain. Overall, 21% of all caregivers reported experiencing some bodily pain, though pain was more than three-fold higher in caregivers of violent patients. There are a number of possible explanations for this. First, pain could be a direct consequence of violence. It is true that most informal caregivers in Japan and in other countries are elderly women, a population that may be more physically fragile and vulnerable to the physical consequences of violence. Another possible explanation is that potential violent behavior increases the stress of caregivers, which manifests itself as greater pain burden. Studies have consistently revealed an association between distress and bodily pain.^{14,22,23} Chronic pain is associated with the development of depression.

Studies have also found that increased caregiver burden is associated with increased incidence of caregiver depression.²⁴ It is possible that that mental health is intimately related to both violent behavior and bodily pain in the present study. Further study is needed to evaluate the relationship between violent patient behavior and caregiver mental health. It is likely that individuals caring for violent patients have an increased risk of developing depression.

Our study results have several limitations. First, we included only Japanese patients. The burden of caregiving is likely universal, but every health-care system is unique, creating unique stressors on caregivers. Secondly, as with all observational studies, adjustment for unknown confounding factors was not possible, though we found little change in the relationship after adjusting for previously reported confounders.

In conclusion, in our a multi-center study conducted on a population of elderly patients, results show that informal caregivers charged with violent patients are likely to experience bodily pain and higher caregiver burden than those whose patients are not violent. These results suggest that violent patient behavior may contribute to both physical and psychological burden on informal caregivers.

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