

Effects of Prescription Drug Reduction on Quality of Life in Community-Dwelling Patients with Dementia

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ABSTRACT - Purpose: Due to the use of multiple drugs and prevalence of diminished cognitive function, community-dwelling elderly individuals are more likely to have drug-related issues. We examined changes in quality of life (QOL) and activities of daily living (ADL) 3 months and 6 months after reducing drug use of dementia patients who had newly begun community-dwelling care. **Methods:** Prescription drug use was reduced in the intervention group, whereas the non-intervention group continued their regimen or began using additional drugs. QOL and ADL were assessed with the Japanese version of the EQ-5D and the Barthel Index, respectively. **Results:** Subjects were 32 individuals aged ≥ 65 years who had begun community-dwelling between March and July 2014 and had received approval for long-term care insurance. On average, the intervention group ($n = 19$) stopped using 2.6 prescription drugs. After 6 months, the differences in the QOL and ADL scores in the intervention group were -0.03 ± 0.29 and 6.32 ± 18.6 , respectively, while the differences in the QOL and ADL scores in the non-intervention group ($n = 13$) were -0.13 ± 0.29 and -2.69 ± 23.7 , respectively. In the intervention group, ADL scores were significantly increased by 14.0 ± 11.1 6 months after reduced benzodiazepine use. **Conclusions:** QOL was maintained with reduced drug use, while ADL score was slightly increased. In addition, the reduction of benzodiazepine use significantly increased ADL. In order to reduce polypharmacy among community-dwelling elderly patients, it is necessary to create an opportunity for pharmacists to re-examine their prescriptions

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INTRODUCTION

With the Japanese society aging rapidly, community-dwelling medical care has become a social necessity. The morbidity rate of dementia among the elderly Japanese aged over 65 years is estimated to be 15%, and the number of individuals suffering from dementia is estimated to be approximately 4.62 million (1). To cope with dementia, we need to understand dementia accurately and improve care and medical treatments. At present, the goal is to allow elderly people including dementia patients to lead high-quality lives.

Medical care for community-dwelling elderly individuals consists primarily of drug therapy; therefore, the number of community-dwelling

elderly individuals who experience polypharmacy-induced problems is expected to increase. Due to the use of multiple drugs and diminished cognitive function, community-dwelling elderly individuals are more likely to have problems using drugs appropriately. Patients who use six or more drugs have been reported to show a higher incidence of adverse drug reactions than that in other patients (2).

Although there are very few intervention methods for the care of community-dwelling

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patients, Salonoja et al (3) reported that instruction and proposals by geriatric internists to reexamine drug use for each adverse event yielded the following results: in a 12-month observation period, the use of benzodiazepines (BZs) decreased by 35% in an intervention group, whereas it increased by 4% in a non-intervention group. On the other hand, Rikala et al (4) reported that reexamination of drug administration by nurses showed no changes in the use of psychotropic prescription drugs or antianxiety prescription drugs. Reports that examined the effects of inappropriate prescriptions and polypharmacy (5,6,7) confirmed increased risks for all predicted adverse events (such as falls, emergency outpatient examination, and hospitalization) in community-dwelling patients. Moreover, the relationship between BZ use and falling among elderly individuals at home has been confirmed in recent studies (8,9).

A survey conducted in community-dwelling care managers and nurses in Aichi Prefecture revealed that their greatest expectation of pharmacists is “proposing prescription drug reduction” (10). It has also been reported that pharmacists wish to cooperate with professional caregivers in communities and would like to have opportunities to do so (11). This report highlights opportunities for pharmacists to cooperate with professional caregivers in communities to propose prescription drug reduction in community-dwelling care patients.

Based on this perspective, we proposed and implemented drug reduction in community-dwelling dementia patients who received recent house calls under the supervision Takase Clinic (Tokyo).

We then examined changes in quality of life (QOL) and activities of daily living (ADL) three and six months after drug reduction.

SUBJECTS AND METHODS

Study Period and Patient Characteristics

The subjects of this study were 50 community-dwelling patients aged ≥ 65 years who had been approved for long-term care insurance and who began receiving care from Takase Clinic (Tokyo) between March and July 2014. All subjects provided consent to participate in the study. Based on physician assessment, the original 50 subjects were divided into an intervention group and a non-

intervention group, which both consisted of 25 subjects each (Table1). In terms of antedementia drugs, they were prescribed donepezil (53.1%), galantamine (0%), rivastigmine (9.4%) and memantine (25.0%). Seven patients did not receive antedementia drugs because of side effects. The proportion of patients on benzodiazepines was 53% (17/32).

For subjects in the intervention group, prescription drugs were reduced. The subjects in the intervention group were reduced prescription drugs by the proposal made by pharmacist. Pharmacist held a research study with Takase Clinic. Subjects in the non-intervention group either continued their prescriptions as before or began using additional drugs. After excluding patients who were not community-dwelling for the full study period of six months (owing to death, hospitalization, or admission to care facilities), the final subject pool comprised 32 patients (64% of the initial subject pool). The physician assessment resulted in discrimination if the patient would be able to tolerate withdrawal of medications. The lack of randomization is a significant limitation of the study.

Study Outcomes and Assessment Methods

QOL was examined with the Japanese version of the EQ-5D (12) (Figure 1), which was developed to assess health-related QOL. The Japanese-language edition of the EQ-5D (12) divides a person's state of health into five dimensions (mobility, self-care, usual activities, pain/discomfort, and anxiety/depression) and evaluates each dimension on a 5-point scale. The answers obtained from caregivers are converted into a single yardstick—a utility index—using the Japanese-language edition of the utility conversion table. According to the utility index, “best imaginable state of health” is defined as 1 and death is defined as 0. Using this index, evaluations can be made in cases of relative performance differences (according to sector) and where comprehensive assessment of therapeutic effects is problematic, such as “although discomfort and anxiety disappeared, the degree of mobility worsened” (13). Naglie et al. (14) used 3 methods to evaluate the QOL of Alzheimer's disease patients, namely, the Health Utilities Index Mark III (HUI-III), Quality of Well-Being (QWB), and EuroQol-5 Dimension (EQ-5D), and compared their findings. The authors have reported that evaluations

Table 1. Patient Characteristics

Group	Intervention group	Non-intervention group
Participation, n	25	25
Dropout, n	6	12
	Hospitalization: 3 Care facilities: 3	Death, 3 Hospitalization, 5 Care facilities, 4
Patient, n	19	13
Male:female, n	15:4	10:3
Mean age	88.3 ± 8.4 years	83.7 ± 8.0 years
Level of care needed	2.6 ± 1.3	2.3 ± 1.4
Degree of independent daily living for the demented elderly	3.4 ± 1.5	3.5 ± 1.3
Antidementia drugs, n	Donepezil and memantine,3 Donepezil, 9 Rivastigmine,2 Memantine,1 No medicine,4	Donepezil and memantine,3 Donepezil:5 Rivastigmine:1 Memantine:1 No medicine:3
Benzodiazepines	10	7

Level of care needed (scored from 1 to 5): Requires partial care (1), Requires mild care (2), Requires moderate care (3), Requires severe care (4), Requires full nursing care at all times (5); **Degree of independent daily living for the demented elderly (scored from 1 to 5):** Some dementia, but mostly independent in everyday life (1), Some difficulties of condition, action, or communication that interfere with everyday life (2), Difficulty of condition, action, or communication that interferes with everyday life is observed. Care is required (3), Difficulty of condition, action, or communication that interferes with everyday life is observed frequently. Care is always required (4), Special medical treatment is required (5).

by EQ-5D were the most reliable, valid, and feasible.

ADL was assessed with a Barthel Index questionnaire (15,16) (Table 2), since Takase et al. showed validation of QOL and ADL in dementia patients by using the Barthel index with EQ-5D (17). QOL and ADL assessed in interviews with the patients during community-dwelling visits, by the same care manager, at the beginning of community-dwelling care, three months and six months after drug reduction. QOL and ADL scores at the beginning of community-dwelling care were subtracted from the respective scores at three months and at six months. The differences in QOL and ADL scores at three and six months after drug reduction were compared with scores at the beginning of community-dwelling care. It is very difficult to keep the patients in community dwelling, since they are very old and their physical condition is getting worse day by day. Therefore, we have chosen every 3 months as the study timeframe. In reducing prescription drugs, the following items were taken into consideration based on examinations by Takase Clinic: the list of drugs

requiring particular care in administration for elderly patients (The Japan Geriatrics Society, 2005)(18), utilization of combination drugs, simplification of administration (from three times per day to once per day, etc.), and utilization of orally disintegrating tablets. Temporary medications (including medicines to be taken only once) were excluded from the daily drug counts. BZs have been reduced in prescription, since BZs were listed in the list of drugs requiring particular care in administration for elderly patients (18). Therefore, cases of BZ reduction were a particular focus of the investigation. All the medications reviewed based on the list of drugs requiring particular care in administration for elderly patients (18).

Ethical Considerations

In accordance with the ethics guidelines of epidemiological studies, consent was obtained orally from patients (or family members/other caregivers in cases where expression of intent was difficult by patients themselves) regarding their participation in the research and was recorded in

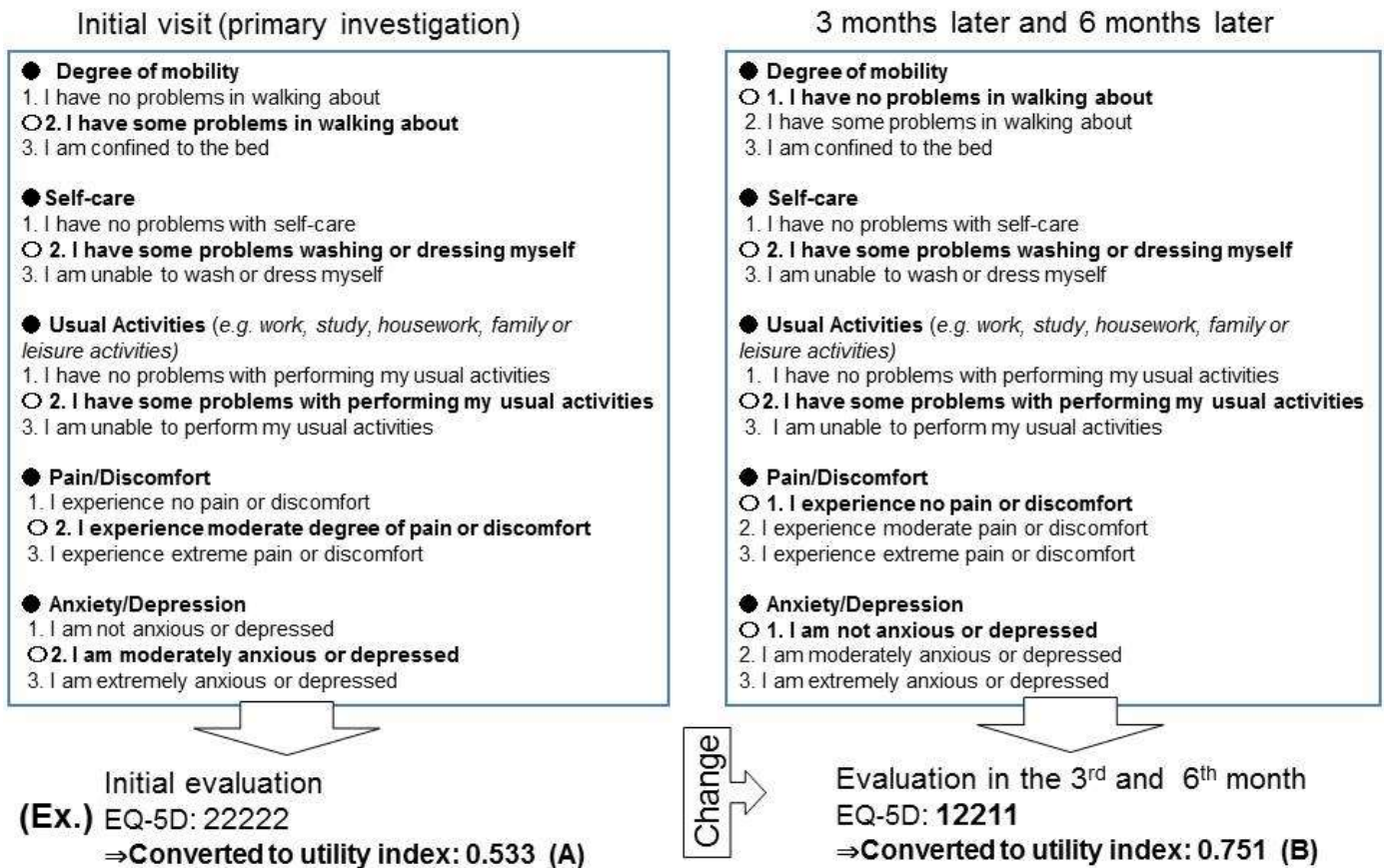


Figure 1. Question posed in the EuroQol-5 Dimension (EQ-5D) and the extent of change over time (QOL Improvement B-A= 0.218)

writing. If the patients could not understand the contents of the agreement, their family or caregiver received explanation enough and signed written consent. The Ethics Committee of NPO Japanese Drug Organization of Appropriate Use and Research approved the research protocol (2014#2). All data analyses were conducted after names were made anonymous.

RESULTS

Patient Characteristics

As depicted in Table 1, in the intervention group with dementia, the mean age was 88.3 ± 8.4 years, the mean level of care needed (scored from 1 to 5) was 2.6 ± 1.3 , and the mean independence degree of daily living for the demented elderly (scored from 1 to 5) was 3.4 ± 1.5 . Six patients (24%) in the

intervention group dropped out of the study six months after the initial visit. Three patients dropped out of the study owing to hospitalization, while three patients dropped out owing to admission to care facilities.

In the non-intervention group with dementia, the mean age was 83.7 ± 8.0 years, the mean level of care needed was 2.3 ± 1.4 , and the mean independence degree of daily living for the demented elderly (scored from 1 to 5) was 3.5 ± 1.3 . Twelve patients (48%) in the non-intervention group dropped out of the study six months after the initial visit. Three patients dropped out of the study owing to death, five patients dropped out of the study owing to hospitalization, and four patients dropped out of the study owing to admission to care facilities.

Table 2. Barthel Index questionnaire

Question	Answer	Score
Feeding	Independent	10
	Partial assistance (needs help cutting)	5
	Dependent	0
Transferring to bed	Independent	15
	Mild partial assistance or monitoring	10
	Major assistance, can sit	5
	Dependent or impossible	0
Grooming	Independent (face/hair/teeth/shaving)	5
	Needs help with personal care	0
Toilet use	Independent	10
	Needs some help, but can do some things alone	5
	Dependent or impossible	0
Bathing	Independent	5
	Partial assistance or impossible	0
Walking	Independent (but may use any aid, such as a stick)	15
	Walks with the help of one person for >45 m	10
	Wheelchair independent, including corners, for >45 m	5
	Immobile or <45 m of mobility	0
Stairs	Independent	10
	Needs help (verbal, physical, carrying aid)	5
	Incapable of using stairs	0
Changing clothes	Independent	10
	Partial assistance (standard time)	5
	Other than those above	0
Defecation control	Continent	10
	Occasional accident	5
	Incontinent (or needs to be given enemas)	0
Bladder control	Continent	10
	Occasional accident	5
	Incontinent (unable to manage alone)	0
		TOTAL (0-100)

Table 3 shows the mean number of prescription drugs administered to each group. In the intervention group, the number of prescription drugs significantly decreased 3 months after the initial visit.

Differences in QOL and ADL Scores Three and Six Months after the Initial Visit

Table 4 shows differences in QOL and ADL scores three and six months after the initial visit. In the intervention group, QOL scores were maintained, while ADL scores slightly increased. In the non-intervention group, the QOL and ADL scores slightly decreased.

Table 3. Change in number of drugs prescribed 3 months after the initial visit

Group	n	Number of drugs prescribed	
		Initial visit	3 months
Intervention	19	7.1 ± 2.3	4.5 ± 2.1 *
Non-intervention	13	6.0 ± 2.7	6.7 ± 2.4

Data are shown as mean ± SD. * p < 0.01 vs. initial visit (paired t-test)

Table 4. Changes in QOL and ADL 3 and 6 months after the initial visit

Group	3 month score - initial score		6 month score - initial score	
	QOL score	ADL score	QOL score	ADL score
Intervention	0.09 ± 0.28	5.25 ± 15.0	-0.03 ± 0.29	6.32 ± 18.6
Non-intervention	-0.07 ± 0.20	1.33 ± 27.9	-0.13 ± 0.29	-2.69 ± 23.7

Data are shown as mean ± SD.

Table 5 shows QOL and ADL scores, respectively, for cases in the intervention group in which BZs were reduced (BZ reduction group, n = 10) and not reduced (BZ non-reduction group, n = 9), as well as those of the non-intervention group (n = 13). The reduced BZs were etizolam (four patients), brotizolam (four patients), triazolam (one patient), flunitrazepam (one patient), and lorazepam (one patient). In the BZ reduction group, the number of prescription drugs used was 6.6 ± 1.7 before intervention and 4.2 ± 1.8 after intervention. In the BZ non-reduction group, the number of prescription drugs used was 8.2 ± 2.3 before

intervention and 5.1 ± 2.2 after intervention. The BZ reduction group showed significant differences in QOL and ADL scores compared with both the BZ non-reduction and non-intervention groups six months after the initial visit. The lack of increase in QOL scores in the BZ non-reduction intervention group was due to the unchanged scores for pain/discomfort questions and worsened scores for anxiety/depression questions. Among specific ADL items, significant differences were observed in transferring to bed, walking, and bladder control 6 months after the initial visit.

Table 5. Effect of benzodiazepine (BZ) reduction on QOL 3 and 6 months after the initial visit

Group	n	3 month score - initial score	6 month score - initial score
Intervention group (BZ reduction)	10	0.13 ± 0.21*	0.003 ± 0.25
Intervention group (BZ non-reduction)	9	-0.05 ± 0.31	-0.08 ± 0.31
Non-intervention group	13	-0.07 ± 0.20	-0.13 ± 0.29

Data are shown as the difference from initial visit (mean ± SD). * p < 0.05 vs. initial visit (paired t-test)

Effect of benzodiazepine (BZ) reduction on ADL at 3 and 6 months after the initial visit

Group	n	3 month score - initial score	6 month score - initial score
Intervention group (BZ reduction)	10	10.00 ± 12.5*	14.0 ± 11.1**, #
Intervention group (BZ non-reduction)	9	1.11 ± 15.9	-2.22 ± 21.2
Non-intervention group	13	1.33 ± 27.9	-2.69 ± 23.7

Data are shown as the difference from initial visit (mean ± SD). * p < 0.05 ** p < 0.01 vs. initial visit (paired t-test). # p < 0.05 vs. no BZ reduction of intervention group or non-intervention group (Student's t-test)

DISCUSSION

Implementation of prescription drug reduction requires a relationship of trust between community-dwelling patients and the prescribing physician. By adhering to the Japan Geriatric Society's list of drugs requiring particular care in administration to elderly patients, we were able to reduce prescription drug use effectively. Although QOL and ADL values are decreased in cases of death and hospitalization, no assessment of such changes has been performed. In addition, many patients in the non-intervention group were anxious regarding their symptoms; therefore, owing to ethical considerations, we were unable to assign subjects to groups randomly. Because the subjects were assigned to groups based on physician assessments, only limited between-group comparisons were possible. The number of prescription drugs taken by each patient was decreased by an average of 2.6 drugs in the intervention group. In addition, reducing the frequency of drug use led to a reduction in care burden. Moreover, prescription drug use was successfully reduced with little stress to patients or caregivers through monitoring during regular home visits by care and nursing staff.

Although the subjects were elderly individuals, and QOL and ADL scores decline with age, the intervention group demonstrated stable QOL scores and slightly increased ADL scores six months after reduction of drug use. In addition, the BZ reduction subgroup within the intervention group demonstrated a significant increase in ADL scores, as well as significant increases in scores for specific ADL items: transferring to bed, walking, and bladder control. The lack of increase in QOL scores in the intervention group was due to the unchanged scores for pain/discomfort questions and worsened scores for anxiety/depression questions. Although the worsened scores for anxiety/depression questions are a troubling result, this change was not considered as a major problem by the care or nursing staffs or the patients' families. Anxiety/depression in the present study may have been related to habituation to BZs and anxiety due to reducing BZ use. The present study found that the reduction of BZ use based on physician assessment resulted in improved ADL scores and stable QOL. However, we believe that this improvement could disappear if the study were continued since QOL and ADL decline with age.

Future investigations of the effects of reduction of drug use must be conducted over longer periods of time, and the number of community-dwelling patients included in such studies must be increased. In community-dwelling care environments, the reduction of prescription drug use requires increased monitoring by physicians and pharmacists, as well as the cooperation of care and nursing staffs.

The role of pharmacist is to propose study protocol and suggest reduction of prescription drugs to doctors. For community-dwelling elderly individuals who visit multiple medical facilities, the patient's regular pharmacist must take the lead role in prescription drug reduction. In the 2013 Survey of Medical Care Activities of Public Health Insurance (19), the mean numbers of prescription drugs used by individuals aged 65–74 years and individuals aged ≥ 75 years were 3.8 and 4.8, respectively, demonstrating the high rate of prescription drug use among elderly individuals. In order to reduce polypharmacy among elderly individuals, it is necessary to create an opportunity for the pharmacist to re-examine prescriptions. In addition, physicians, nurses, care staff, and other professionals involved in community-dwelling patient care must be involved in the reduction of drug use.

CONCLUSION

In community-dwelling patients, QOL and ADL were maintained after reduction of prescription drug use based on the assessment of the prescribing physician. In addition, the reduction of BZ use led to improvement in QOL and ADL scores 3 months after initial visit. Medical staff should play a role in reduction of polypharmacy in community-dwelling patients. Future investigations over long periods of time and with greater numbers of community-dwelling patients are necessary to confirm these results and facilitate patient care practices in community-dwelling environments.

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