Effects of Pharmacist-Led Dementia Care Round Interventions on the Use of Sleep Medications

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ABSTRACT

Objective: To investigate pharmacist-led dementia care rounds (PDRs) and their effect on the use of sleep medications, including the number and content of prescription suggestions during PDRs and use of sleep medications at the time of hospitalization and discharge.

Methods: This was a retrospective observational study of inpatients who received PDR intervention at a hospital in Japan from January 1 to December 31, 2020. The PDR team, consisting of a pharmacist and dementia care nurse, made prescription suggestions through the attending nurse, and the attending physician made the decision to change the prescription. Use of sleep medication was investigated by classifying patients into 2 groups: those for whom prescription suggestions from PDRs were accepted and those for whom they were rejected.

Results: PDRs were conducted 1,164 times with 418 patients, and prescription suggestions were made 330 times (28.4%) for 173 (41.4%) patients. Of these, 234 (70.9%) prescription suggestions were accepted. At the time of discharge, the percentage of patients using benzodiazepine-based sleep medications was 3.1% in the accepted group and 11.9% in the rejected group. The percentage of patients using non–benzodiazepine-based sleep medications was 22.1% in the accepted group and 9.5% in the rejected group. Further, the percentage of patients using non–γ-aminobutyric acid receptor agonist drugs as sleep medications was 9.2% in the accepted group and 2.4% in the rejected group. The results show that the percentage of patients using benzodiazepine-based sleep medications was significantly lower in the accepted group than in the rejected group ($P = .022$).

Conclusions: PDR intervention contributed to the appropriate use of sleep medications, with nearly 30% of prescription suggestions. PDRs may play an important role in the appropriate use of sleep medications, and active participation of pharmacists in dementia care is necessary.

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Fifteen percent of people in Japan aged ≥65 years have dementia[1]; therefore, it is necessary to expand medical care, welfare services, and community support for these patients. Patients with dementia often show behavioral and psychological symptoms of dementia (BPSD) due to changes in their living environment associated with hospitalization. Since BPSD is a burden on patients and medical staff,[2,3] it is necessary for the medical care team to provide interventions for these patients. The Ogaki Municipal Hospital in Japan established a dementia support team to provide such interventions for patients with BPSD. The dementia support team conducts multidisciplinary rounds (MDRs) for dementia care. This team includes health care experts such as pharmacists, physiotherapists, occupational therapists, speech therapists, and nutritionists among others. In recent years, the importance of pharmacists within the support team conducting MDRs has been reported.[4–6]

While MDR allows for multifaceted interventions with patients, the multidisciplinary team can only intervene with some of them. With the increasing prevalence of dementia,[1] the dementia care teams need to intervene with many patients. Therefore, we created pharmacist-led dementia care rounds (PDRs) with a team consisting of a pharmacist and a dementia care nurse. Older adults are at high risk of adverse drug reactions due to their decreased metabolic capacity[7] and polypharmacy.[8] Therefore, safe pharmacotherapy is required. We believe that PDR can make a significant contribution toward providing appropriate pharmacotherapy.

Dementia care rounds address a wide range of issues in medical practice. Elderly individuals, in particular, tend to have shorter sleep duration,[9] and a change in the environment due to hospitalization often leads to insomnia.[10] Therefore, advice is needed when providing care for patients experiencing symptoms such as insomnia and night delirium. Pharmacotherapy for insomnia includes the use of sleep medications. Sleep medications such as benzodiazepines (BZDs) are not recommended for the elderly due to high risk of adverse effects,[11] and nonbenzodiazepines (n-BZDs) are a safer option.[12] In addition, ramelteon and suvorexant, which do not target the γ-aminobutyric acid (GABA) receptors (also known as non-GABA agonist drugs [n-GADs]), are also safe.[13] The purpose of PDR is to promote the appropriate use of sleep medications by avoiding the administration of BZDs

Clinical Points

- Pharmacist-led dementia care rounds (PDRs) are an efficient way to correct sleep medication use.
- PDR allows for many patient rounds and pharmacologic interventions.
- PDR can contribute to benzodiazepine discontinuation, which is especially important in the elderly.

and to ensure sleep duration using n-BZD and n-GAD medications.

In this study, we calculated the number and content of prescription suggestions during PDRs and investigated the use of sleep medications at the time of hospitalization and discharge to determine the effect of PDR intervention.

METHODS

We conducted a retrospective observational analysis of PDR interventions and the effect on prescribing of medications to inpatients at Ogaki Municipal Hospital between January 1 and December 31, 2020. We investigated the PDRs in terms of the number, content, and acceptance rate of prescription suggestions using data available in the electronic medical records. This study was approved by the Institutional Review Board of Ogaki Municipal Hospital.

Sample

Patients who received PDR intervention were included in the study, and those who died during hospitalization were excluded. The data on PDR interventions and prescription details were collected from the electronic medical records.

PDR Procedure

Nurses request dementia care round interventions for inpatients with dementia and delirium, and the dementia care nurse receives the request. The dementia care nurse assigns patients who require pharmacist intervention to the PDR. The pharmacist and dementia care nurse then visit the ward. The pharmacist collects the relevant information from the electronic medical records and the attending nurses. The dementia care nurse provides advice to the attending nurses to improve environmental arrangements and patient supports in the electronic medical record and verbally. The pharmacist reviews the drug therapy and, if necessary, makes prescription suggestions to the attending physician through the attending nurses and the electronic medical record. The pharmacist and the dementia care nurse then visit the patient and check their condition, including level of wakefulness and speech. This activity is conducted once a week during the daytime between 1:00 PM and 4:00 PM.

Data

Patient backgrounds and other details regarding their hospitalization were collected retrospectively from electronic medical records retrieved from the department of hospitalization. Patient background data included age, sex, height, weight, body mass index, sequence of events during hospitalization to discharge (days of hospitalization, days from intervention to discharge, number of inpatients coming from their home, and number of patients discharged to home), number of inpatients by department (medicine or surgery), and the type of dementia and long-term care requirement certification.

Data were retrieved on the use of sleep medications (BZD, n-BZD, n-GAD) at the time of hospitalization and discharge, change of BZD use (discontinuation of BZD, addition to BZD), number of medications (at hospitalization, at discharge, and change in number of drugs), sleep duration (3 days after hospitalization, 3 days before discharge, and average change), patients with physical restraint (started before intervention, after intervention, and at the time of discharge), and occurrence of falls (before and after intervention). Drug types were classified based on the Anatomical Therapeutic Chemical Classification System. Benzodiazepine derivatives were classified as BZD, BZD-related drugs as n-BZD, and ramelteon and suvorexant as n-GAD. We defined antihistamines, narcotics, and corticosteroids as delirium risk drugs based on previous reports.[14]

We tabulated the number and content of PDRs from January to December 2020. The main content included the number of rounds and the number of prescription suggestions. Prescription suggestions were categorized by drug type suggested (antidementia drugs, antipsychotics, antidepressants, sleep medications, delirium risk drugs, others), content of suggestions (addition, dose change, discontinuation, usage change, others), and the number of accepted prescription suggestions. We classified patients whose attending physician accepted the prescription suggestions at least once as the accepted group and those who rejected all suggestions as the rejected group.

Outcomes

The primary endpoint of this study was the proportion of sleep medications (BZD, n-BZD, n-GAD) used at the time of hospitalization and discharge. The secondary endpoints of this study were changes in the number of drugs, changes in sleep duration, presence of physical restraints, and presence of falls. The change in the number of drugs was defined as the difference between the number of drugs at the time of hospitalization and discharge. The change in sleep duration was defined as the difference between the average sleep time during the 3 days immediately after hospitalization and the average sleep time during the 3 days immediately before discharge.

Data Analysis

The differences in continuous data were compared using the Mann-Whitney U test, and differences in categorical data were compared using Fisher exact test or χ^2 test. In all statistical analyses, the level of significance was set at .05.

Table 1. Details of Prescription Suggestions Provided During Pharmacist-Led Dementia Care Rounds

Type of Drug Prescription Suggestion	Addition			Dose Change			Discontinue			Usage Change			Other			Total		
	n[a]	Suggestions (%)[b]	Acceptance (%)[c]	n[a]	Suggestions (%)[b]	Acceptance (%)[c]	n[a]	Suggestions (%)[b]	Acceptance (%)[c]	n[a]	Suggestions (%)[b]	Acceptance (%)[c]	n[a]	Suggestions (%)[b]	Acceptance (%)[c]	n[a]	Suggestions (%)[b]	Acceptance (%)[c]
Antidementia drugs	29	8.8	44.8	30	9.1	86.7	8	2.4	50.0	4	1.2	75.0	0	…	…	71	21.5	64.8
Antipsychotics	13	3.9	84.6	14	4.2	78.6	13	3.9	92.3	6	1.8	66.7	0	…	…	46	13.9	82.6
Antidepressants	1	0.3	100.0	2	0.6	100.0	1	0.3	100.0	3	0.9	100.0	0	…	…	7	2.1	100.0
Sleep medications	60	18.2	73.3	11	3.3	63.6	9	2.7	77.8	60	18.2	66.7	0	…	…	140	42.4	70.0
Delirium risk drugs	3	0.9	66.7	1	0.3	100.0	9	2.7	55.6	0	…	…	0	…	…	13	3.9	61.5
Other	19	5.8	52.6	2	0.6	100.0	20	6.1	70.0	10	3.0	80.0	2	0.6	100.0	53	16.1	66.0
Total	125	37.9	64.8	60	18.2	81.7	60	18.2	71.7	83	25.2	69.9	2	0.6	100.0	330	100.0	70.9

[a]Number of prescription suggestions.
[b]Percentage of prescription suggestions.
[c]Percentage of acceptance of prescription suggestions.

RESULTS

Outline of PDR Procedure

PDRs were performed 1,164 times for 418 patients in a year. Prescription suggestions were made in 330 (28.4%) PDRs performed for 173 (41.4%) patients. Of the 330 prescription suggestions made, 234 (70.9%) were accepted. Table 1 shows the breakdown of the prescription suggestions provided. The most common prescription suggestions, given to 18.2% of the patients, respectively, were the addition of sleep medications and usage change. These prescriptions were followed by dosage change (9.1%) and addition (8.8%) of antidementia drugs.

Effect of PDR

Table 2 presents the background information for the patients. There were 173 patients: 131 in the accepted group and 42 in the rejected group. In terms of patient background, there was no significant difference between the accepted and rejected groups.

With respect to the primary endpoint of the study, there was no significant difference between the rates of participants from the accepted and rejected groups regarding the use of sleep medications during hospitalization ($P = .949$) (Figure 1). However, there were significant differences in the rates of patients using sleep medications at discharge. The rate of patients in the accepted group using BZDs decreased, and those using n-BZDs and n-GADs increased ($P = .022$) (Figure 2).

With respect to the secondary endpoints of the study, the use of physical restraint started before intervention was significantly higher in the accepted group compared with the rejected group ($P = .013$). There were no significant differences between the accepted and rejected groups for the other items (Table 3).

DISCUSSION

In this study, PDR contributed to the administration of many interventions, mainly regarding sleep medications, with nearly 70% acceptance. The results also showed that PDR may contribute to the reduction of BZDs at the time of hospital discharge. These results suggest that PDR is a useful technique for administering interventions.

PDR is a round of visits conducted by professionals of only 2 occupations: pharmacists and nurses. Rounds with fewer professionals involved in fewer occupations can lead to an increase in the number of interventions with less effort. More than 1,000 PDRs were performed within the study period, with 40% of patients receiving interventions and 30% receiving prescription suggestions. Further, the acceptance rate was approximately 70%. PDR interventions, when categorized by drug type, mostly comprised interventions involving sleep medications and antidementia drugs. In terms of content of suggestions provided by PDR, most interventions involved addition of drugs and changes in drug dose. The elderly are prone to insomnia,[10] and appropriate use of sleep medications is also necessary.[11,15] Therefore, PDR was able to provide interventions regarding sleep medication for many patients. Interventions administered using antidementia drugs mainly involved addition of these drugs for patients with untreated dementia and dose change, which is similar to the outcomes of a previous MDR report.[5]

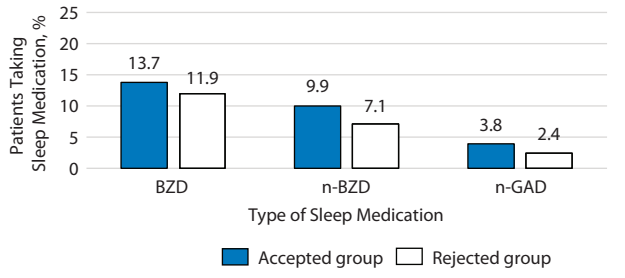
Regarding the effect of PDR, the use of BZDs at discharge was significantly lower in the accepted group. Since the use of sleep medications during hospitalization was similar between the 2 groups, it is assumed that the reduction in the rate of use of BZDs was due to the PDR intervention.

Table 2. Characteristics of the Patients

Characteristic	Accepted Group (n = 131)	Rejected Group (n = 42)	*P*/Test
Age, median (IQR), y	85 (80–89)	86 (80–90)	.750/Mann-Whitney U
Sex, n (%)			.169/χ^2
Male	62 (47.3)	25 (59.5)	
Female	69 (52.7)	17 (40.5)	
Height, median (IQR), cm	151 (145.0–160.0)	153.5 (147.3–160.0)	.350/Mann-Whitney U
Weight, median (IQR), kg	44.8 (38.1–53.3)	42.4 (37.1–52.4)	.380/Mann-Whitney U
Body mass index, median (IQR), kg/m^2	19.6 (17.2–22.4)	18.4 (15.6–20.4)	.111/Mann-Whitney U
Sequence of events			
Days of hospitalization, median (IQR)	23 (17–38)	22 (14–34)	.312/Mann-Whitney U
Days from intervention to discharge, median (IQR)	14 (9–23)	13 (7–22)	.188/Mann-Whitney U
Inpatients coming from their home, n (%)	91 (69.5)	24 (57.1)	.141/χ^2
Patients discharged to home, n (%)	36 (27.5)	14 (33.3)	.467/χ^2
Inpatients by department, n (%)			.581/Fisher exact
Internal medicine department	117 (89.3)	36 (85.7)	
Surgical department	14 (10.7)	6 (14.3)	
Type of dementia, n (%)			.246/Fisher exact
Alzheimer's disease	17 (13.0)	9 (21.4)	
Dementia with Lewy bodies	10 (7.6)	0 (0.0)	
Other type	2 (1.5)	0 (0.0)	
Unknown type	53 (40.5)	18 (42.9)	
Long-term care requirement certification, n (%)			.708/Fisher exact
Requiring help 1	0 (0.0)	0 (0.0)	
Requiring help 2	3 (2.3)	0 (0.0)	
Long-term care level 1	15 (11.5)	5 (11.9)	
Long-term care level 2	20 (15.3)	6 (14.3)	
Long-term care level 3	24 (18.3)	7 (16.7)	
Long-term care level 4	14 (10.7)	4 (9.5)	
Long-term care level 5	8 (6.1)	6 (14.3)	

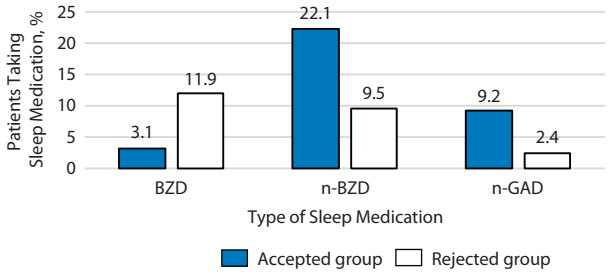
Abbreviation: IQR = interquartile range.

Figure 1. Use of Sleep Medications at the Time of Hospitalization



Abbreviations: BZD = benzodiazepine, n-BZD = nonbenzodiazepine, n-GAD = non–γ-aminobutyric acid agonist drug.

Figure 2. Use of Sleep Medications at the Time of Discharge



Abbreviations: BZD = benzodiazepine, n-BZD = nonbenzodiazepine, n-GAD = non–γ-aminobutyric acid agonist drug.

BZDs are not recommended for the elderly[11] due to the high risk of cognitive decline[16] and falls.[17] Thus, use of n-BZDs and n-GADs has increased. While n-BZDs are safer than BZDs,[12] there is a risk of falls due to their stimulating effect on the GABA receptor, a mechanism that is similar to that of BZDs.[18] n-GADs have a low risk of falls[13] and prevent delirium.[19,20] Thus, use of n-GADs is safe for the elderly. However, patient satisfaction is low.[15] Continued insomnia is associated with increased delirium[21] and mortality.[22] Therefore, it is important to ensure proper sleep duration. In this study, the change in average sleep duration was similar for patients in the 2 groups, even though there was a difference in sleep medications between them. The PDR interventions thus avoided BZD use but still ensured sleep duration with other drugs. Therefore, it is unlikely that the increased use of n-BZDs and n-GADs will unilaterally disadvantage the elderly.

Use of physical restraint may be clinically unavoidable in the provision of safe medical care. However, physical restraint is associated with a risk of delirium,[23] gait disturbance, falls, and hearing impairment.[24] Therefore, it is important to avoid physical restraints in dementia care. In this study, we investigated the rate of physical restraint as a secondary outcome. The rate of patients with physical restraint started before intervention was higher in the accepted group compared to the rejected group, with no significant difference after intervention and at discharge. The difference in physical restraint before intervention may be due to more restless patients in the PDR group, which thus led to the acceptance of the prescription suggestion. It is unlikely that PDR affected physical restraint because the

Table 3. Outcomes Regarding Primary and Secondary Endpoints of the Study

Outcome	Accepted Group (n = 131)	Rejected Group (n = 42)	*P*/Test
Sleep medications, n (%)			
At the time of hospitalization			.949/Fisher exact
BZD	18 (13.7)	5 (11.9)	
n-BZD	13 (9.9)	3 (7.1)	
n-GAD	5 (3.8)	1 (2.4)	
No sleep drugs	96 (73.3)	33 (78.6)	
At the time of discharge			.022/Fisher exact
BZD	4 (3.1)	5 (11.9)	
n-BZD	29 (22.1)	4 (9.5)	
n-GAD	12 (9.2)	1 (2.4)	
No sleep drugs	90 (68.7)	33 (78.6)	
Change of BZD use			
Discontinuation of BZD	16 (12.2)	1 (2.4)	.076/Fisher exact
Addition of BZD	2 (1.5)	1 (2.4)	.568/Fisher exact
No. of drugs, median (IQR)			
At the time of hospitalization	7 (4–10)	6 (4–8)	
At the time of discharge	5 (4–8)	5 (2–7)	
Amount of change	−1 (−3 to 1)	−1 (−3 to 1)	.962/Mann-Whitney U
Sleep duration, median (IQR), hours			
After hospitalization			
First day	6.0 (5.0–7.0)	6.0 (6.0–7.0)	
Second day	6.0 (5.0–7.0)	6.0 (5.0–7.0)	
Third day	6.0 (4.0–7.0)	6.0 (5.0–7.0)	
Before discharge			
First day	6.0 (6.0–7.0)	7.0 (6.0–8.0)	
Second day	6.0 (5.0–7.0)	7.0 (6.0–7.8)	
Third day	6.0 (5.0–7.0)	7.0 (6.0–7.0)	
Change in average	0.0 (−0.7 to 1.0)	0.3 (0.0–1.3)	.130/Mann-Whitney U
Patients with physical restraint, n (%)			
Started before intervention	50 (38.2)	7 (16.7)	.013/Fisher exact
Started after intervention	6 (4.6)	1 (2.4)	1.000/Fisher exact
At the time of discharge	35 (26.7)	6 (14.3)	.101/Fisher exact
Patients with falls, n (%)			
Before intervention	10 (7.6)	1 (2.4)	
After intervention	6 (4.6)	0 (0.0)	
No falling	115 (87.8)	41 (97.6)	.233/Fisher exact

Abbreviations: BZD = benzodiazepine drug, n-BZD = nonbenzodiazepine drug, n-GAD = non–γ-aminobutyric acid agonist drug.

patients with physical restraint were of a similar ratio after intervention and at discharge. There were no significant differences in the other endpoints between the 2 groups.

One limitation of this study was that it did not assess quality of life or other cognitive functions of the patients. Dementia care is based on person-centered care and aims to improve quality of life and cognitive function.[25] However, because of the retrospective nature of the study, we were unable to investigate these variables. Another limitation is the lack of investigation into the use of sleep medications after discharge. Cognitive decline is a risk factor associated with long-term use of BZDs,[16] and long-term use of this class of drugs should be avoided. Because most of the patients were transferred to another hospital or health care facility, we were unable to investigate their use of sleep medications after discharge. Another limitation is that we were unable to show the effects of dementia care nurse intervention. Although this study focused only on pharmacotherapy, the advice for patient care is also important. But because the patients were classified according to their acceptance of prescription suggestions, we could not perform the appropriate evaluation of the dementia care nurse intervention.

In this study, PDRs were performed with many patients, and their contribution to appropriate pharmacotherapy was confirmed. In other words, pharmacists should be involved in both MDR and PDR activities. PDR may play an important role in the appropriate use of sleep medications, and active participation of pharmacists in dementia care is necessary.

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