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Case Report

A Case Improving Somnolence Through Pharmacist Intervention with Special Nursing Home Resident

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Abstract

Aim: To examine the case in which somnolence has been alleviated as a result of pharmacist's intervention with residents of special nursing home receiving polypharmacy.
Methods: The case was extracted from the subjects who had been enrolled in an interventional study conducted by the authors. Information was collected based on records of the pharmacist's intervention, and analyzed to identify the reasons the interventions were successful.
Results: The patient was a female who had been prescribed a drug classified as a potentially inappropriate medication (PIM) according to STOPP-J. In the case, Risperidone was reduced the dose. The resident's improved somnolence and tremors during the day resulting in the resident's activity level and Quality of Life (QOL).
Conclusion: The factors that contributed to alleviating the patients' somnolence were (1) the adverse events were associated with PIMs and the prescriptions were modified, (2) the pharmacists shared information with other medical professionals, and (3) the pharmacists gave the patients individualized attention and monitoring, in collaboration with other medical professionals in a multidisciplinary approach.

Key words : community pharmacist, intervention, PIM, special nursing home, multidisciplinary collaboration

Introduction

As of 2016 there were 9,645 special nursing homes in Japan[1], with 720,400 residents[2]. Special nursing homes are residential facilities for elderly persons who need care, and are referred to as the "final home". As a rule, in order to be accepted as a resident at a special nursing home, a person must be 65 years of age or older and have a care level of 3 or more on the Japanese long-term care insurance system scale of 1 to 5[1].

According to a survey by the Japan Pharmaceutical Association, 74.8% of the residents of special nursing homes have medication prescriptions. Although 93.9% of these residents need their medicine managed by a third person, only 6.2% of special nursing homes have pharmacists who come into the homes to help with drug storage and management (http://www.nichiyaku.or.jp/action/wpcontent/uploads/2010/08/21zaitaku_sien2.pdf). There is consequently an urgent need for pharmacists to be more actively involved in managing the drug therapies of special nursing home residents.

The "2015 Guidelines for Safe Drug Therapy in the Elderly" ("the 2015 guidelines" hereafter)[3], which were published by the Japan Geriatrics Society, contains a list of "Drugs that need to be used with particular care" (STOPP-J). The STOPP-J list is used as a tool for screening patients for "potentially inappropriate medications" (PIMs), and the 2015 guidelines urge that particular caution be exercised when using PIMs[4]. The guidelines also clearly specify the "role of the pharmacist," and note the importance of physicians and pharmacists having a shared awareness of the PIM issue, and that pharmacists need to be actively involved in optimizing a patient's prescriptions.

In Japan, the only report that has verified the outcomes of pharmacist interventions at special nursing home[5] by the authors. The objective of this study was to closely examine the case that had been studied in our aforementioned intervention study in

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which an improvement in somnolence had been achieved[5], and to clarify the reasons for success.

Study design: Descriptive

Study method

We extracted one case for whom an improvement in somnolence had been achieved from the activity records of the pharmacist who performed interventions at special nursing homes, and collected information about the case[5].

The parameters that were considered when performing the interventions were sleep status (Oguri-Shirakawa-Azumi Sleep Inventory, MA version [OSA-MA][6]), the ADL scores (functional independence measure [FIM][7]), and the QOL score (SF-12® v2 Standard, Japanese Version 2.0). PIMs were identified using a list of the nonproprietary names and drug product ID codes for drugs corresponding to STOPP-J's list of "Drugs that need to be used with particular care" (https://www.jpn-geriat-soc.or.jp/tool/xls/list_03.xlsx). We organized the information collected in case report format and examined the factors contributing to the successful achievement of improvement in somnolence.

Ethical considerations

This study was conducted in accordance with the "Ethical Principles of Medical Research in Humans" and with the approval of the Research Ethics Review Board of the Osaka University of Pharmaceutical Sciences (No. 0050).

Case summary

Age: 89 years

Sex: Female

Subject background: Care Level 4. The patient had delusions of persecution and had exhibited speech and behavior such as threatening and attacking other people, and had therefore been started on risperidone 1 month prior to the intervention.

The patient enjoys filling in coloring books.

Current medical history: Hypercholesterolaemia, Hypertension, Angina pectoris, Osteoporosis, Reflux oesophagitis, Venous thrombosis, Delirium, Constipation, Schizophrenia

Parameters taken into account when performing interventions: Sleep status, ADL, QOL

Test values taken into account when performing interventions: AST 19 IU/L, ALT 11 IU/L, LD 155 IU/L, γ-GT 35 IU/L, TG 105 mg/dL, HDL-cho 50 mg/dL, LDL-cho 75 mg/dL, BUN 26.0 mg/dL, SCr 1.05 mg/dL, CCr 29.07 mL/min, Blood pressure 125/73 mmHg, BMI 22.8

Persons managing the subject's medications: The resident nurses and caregivers

Dosage forms the subject was unable to take: None

Adverse event: Somnolence, Tremor, Salivation

Method of preparing the subject's medications: Medicine packets containing all the medications the subject needed to take at one time

Prescriptions: Table 1

Since the patient was initially taking risperidone 0.5 mg twice a day after breakfast and dinner, no inquiries were issued from the dispensing pharmacy because in their judgment there were no issues relating to the dosage and administration. Although the patient's state of agitation improved approximately 1 month after starting treatment, the patient started behaving aggressively towards specific persons. In order to control this behavior, the prescription of risperidone 0.5 mg was changed to 0.75 mg 3 times a day.

Medication compliance: Good when given assistance

Problem list: #1: Somnolence during the day

#2: Extrapyramidal symptoms

Detailed explanation of treatment support/management/prescription interventions:

The pharmacist at the nursing home intervened on March 30, 2018, which was 2 days after the prescription change (risperidone dose increase). When the pharmacist queried the dispensing pharmacy, they answered that they had not issue any inquiries because the physician had informed them of the purpose of the change in the prescription.

The patient was calm at the time of the pharmacist's regular visit, but, the pharmacist personally confirmed that the patient had somnolence during the day, a hard facial expression, and decreased volition. Because the patient also had occasional tremors, the pharmacist suspected that the risperidone might be resulting in somnolence and extrapyramidal symptoms.

Although the patient's state of agitation had improved after taking risperidone for 1 month, the pharmacist determined that consideration needed to be given to reducing the dose, while monitoring the patient. On April 23, the pharmacist proposed that the prescribing physician change the prescription back to risperidone 0.5 mg twice a day.

This resulted in the physician discontinuing the

Table 1　Prescriptions before and after Intervention.

before intervention			after intervention		
Drug name	Dose	Administration	Drug name	Dose	Administration
Amlodipine	2.5 mg	Once a day, after breakfast	Amlodipine	2.5 mg	Once a day, after breakfast
Atorvastatin	10 mg	Once a day, after breakfast	Atorvastatin	10 mg	Once a day, after breakfast
Alfacalcidol	0.5 μg	Once a day, after breakfast	Alfacalcidol	0.5 μg	Once a day, after breakfast
Imidapril hydrochloride	5 mg	Once a day, after breakfast	Imidapril hydrochloride	5 mg	Once a day, after breakfast
Lansoprazole	15 mg	Once a day, after breakfast	Lansoprazole	15 mg	Once a day, after breakfast
* Rivaroxaban	10 mg	Once a day, after breakfast	* Rivaroxaban	10 mg	Once a day, after breakfast
* Magnesium oxide	500 mg	Twice a day, after breakfast and dinner	* Magnesium oxide	500 mg	Twice a day, after breakfast and dinner
* Risperidone	0.75 mg	Three times a day, after every meals	* Risperidone	0.5 mg	Twice a day, after breakfast and dinner

*; Drugs corresponding to potentially inappropriate medication (PIM)

patient's use of risperidone in the middle of the day and changing the prescription to twice a day on April 26.

Interdisciplinary collaboration:

The pharmacist also heard from the caregiver that the patient had stopped doing the coloring books, which she had enjoyed doing before, perhaps because of the patient's somnolence during the day or the tremors and/or salivation that the patient was occasionally experiencing. The pharmacist informed the patient's nurses and caregivers that changing the prescription back (reducing the dose) might result in the patient once again exhibiting threatening or aggressive behaviors to other people and therefore might result in an increased burden of nursing care, and thereby obtained their understanding for recommending a prescription change to the physician. The prescribing physician accepted the proposal in light of the information provided by the pharmacist that "the nurses and caregivers have understood that the patient could once again become aggressive," and changed the prescription.

The pharmacist asked the nurse and the caregiver to continue to monitor the patient even after the change made to the patient's prescriptions.

Results of the intervention: Table 2

As far as the patient's sleep status was concerned, although there were no changes from before to after the intervention in the patient's scores for either Factor I (sleepiness on rising) or Factor II (falling asleep and staying asleep), the intervention resulted in an improvement in the patient's Factor V (length of sleep) score. In addition, examination of the patient's QOL scores found that the patient's role-emotional and vitality scores were improved by the intervention.

According to the caregiver, although the patient occasionally exhibited aggressive speech and behavior during the day, improvements were seen in the patient's decreased volition and tremors, and the patient once again started to enjoy her coloring books, and was sleeping well at night. The pharmacist personally confirmed the improvements in the patient's tremors and somnolence during the day.

The changes to the dose of risperidone and the course of the patient's major symptoms are described below:

*On the 19th day after the dose of risperidone was increased, the pharmacist personally confirmed the following symptoms:

- somnolence during the day
- cold/unemotional facial expression
- decreased volition
- occasional tremors

↓

* Seven days later, these same symptoms continued, along with salivation.

↓

Table 2　Comparison of Sleep Status, ADL and QOL Scores before and after Intervention.

	before intervention	after intervention
Sleep status score[†1]		
Factor I (sleepiness on rising)	10.0	10.0
Factor II (falling asleep and staying asleep)	17.0	17.0
Factor V (length of sleep)	22.5	28.0
ADL score[†2]		
Transfer ① Bed, chair, wheel chair	4	3
Transfer ② Toilet	4	3
Transfer ③ Bathing, showering	4	3
Locomotion ④ Walking, wheel chair	5	5
Total score for motor items only	17	14
Social recognition ⑤ Social interaction	6	6
Total score for all 5 items	23	20
QOL score[†3]		
Total score for 8 items	387.5	412.5
QOL Physical functioning	25	0
QOL Role functioning (physical)	50	50
QOL Bodily pain	100	100
QOL General health	25	25
QOL Vitality	0	25
QOL Social functioning	100	100
QOL Role functioning (emotional)	25	50
QOL Mental health	62.5	62.5

[†1]: Use the OSA-MA: Oguri-Shirakawa-Azumi sleep inventory for middle age and aged version
[†2]: Use the FIM: Functional Independence Measure
[†3]: Use the SF-12® v2

* Three days after that,
The dose of risperidone was reduced to twice a day.
↓
* On day 15 after the dose was reduced,
an improvement in the patient's symptoms was confirmed.

We assessed parameters related to activities of daily living that could be confirmed by a pharmacist visiting a nursing home (sleep status, ADL score, and QOL score), in addition to drug-related adverse events (especially PIMs). Although it would be preferable to perform assessments using the "DIEPSS (Drug Induced Extra-Pyramidal Symptoms Scale)[8]" as well, for those drugs that may cause extrapyramidal symptoms, which occurred in this case, DIEPSS assessments require sufficient medical knowledge and assessment training. This is therefore a matter that should be investigated further.

Discussion

Looking at the patients' sleep status, a comparison of the patients' sleep status scores before and after the interventions shows that the interventions either maintained or improved the patients' conditions. This suggests that, as a rule, improvements in somnolence contribute to the maintenance of or improvement in sleeping at night. Next, looking at the patients' ADL scores, no marked changes were found in the patients' ADL scores. This is attributed to the fact that because the patients' care levels were high and they were not very active to begin with, no marked improvements could be expected. Lastly, examination of the patients' QOL scores shows that patient achieved increases in her QOL vitality and role functioning (emotional) scores, and this was attributed to her ability to resume her hobby of coloring in coloring books.

We think that there are 3 main reasons for the improvements in somnolence that were achieved in this study. The first reason is that associations between adverse events and PIMs were identified through close monitoring of the patients. In this case, Risperidone was listed in STOPP-J and reduced the dose as a result of the pharmacists' interventions. The

"Activity Recording Program" that was used by the pharmacists in the intervention study was equipped with a function allowing PIMs that were present in the patients' prescriptions to be automatically identified. These results therefore suggest that the use of this program may have made it easier for the pharmacists to identify associations between the adverse events and the PIMs.

The second reason is the interdisciplinary sharing of information. When visiting the nursing homes, the pharmacists consulted other medical professionals about their observations of the patients and accompanied them on their rounds. This information sharing led to the patients' prescriptions being reviewed.

The third reason is that the pharmacists worked with the other medical professionals involved in the patients' care to monitor the progress of individual patients. In the patient discussed in this study, the pharmacists informed the other medical professionals at the nursing homes about what exactly the patients should be monitored for after their prescriptions had been changed, and built collaborative relationships with these nursing home staff members that allowed them to continue to follow the patients progress on an individualized basis even when the pharmacists themselves were not present.

A causal relationship between the increase in PIMs and the increase in adverse events (falls) was suggested[5], and it was found that PIM-induced adverse events occurred in 8% of elderly patients who were staying at home and had been prescribed PIMs[9]. Therefore, the "Collaboration Scheme among Multiple Professions and Activity Recording Program, Focusing on PIMs" that is proposed in this study would, if utilized by community pharmacists, contribute to the more appropriate and safe use of drug therapies in medical care for the elderly.

Conclusions

We believe that the reasons that improvements in somnolence were achieved are (1) associations between adverse events and PIMs were identified, and the patients' prescriptions were reconsidered, (2) the pharmacists shared information with medical professionals in other disciplines, and (3) the pharmacists worked with medical professionals in other disciplines to achieve individualized patient monitoring.

Conflicts of Interest

The authors have no conflicts of interest to declare.

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