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Original article

Comprehensive medication management services influence medication adherence among Japanese older people

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Abstract

Objective: Assistance from health professionals is very important to ensure medication adherence among older people. The present study aimed to assess the relationship between receipt of comprehensive medication management services by primary care physicians and medication adherence among community-dwelling older people in rural Japan.

Methods: Data including medication adherence and whether or not a doctor knew all the kinds of medicines being taken were obtained from individuals aged 65 years or older who underwent an annual health checkup between February 2013 and March 2014 at a public clinic in Asakura. The subjects were divided into 2 groups: adherent (always) and non-adherent (not always). A logistic regression analysis was performed to assess the association between the presence of a doctor who was fully responsible for medication adherence and self-reported adherence. Predictors that exhibited significant association (p-value < 0.05) with medication adherence in a univariate analysis were entered in the model as possible confounding factors. The results were presented as odds ratios (OR) and 95% confidence intervals (CI).

Results: Among four-hundred ninety-seven subjects in total, the adherent group included 430 subjects (86.5%), and its members were older than those of the non-adherent group. Significant predictors of good medication adherence included older age, no discomforting symptoms, eating regularly, diabetes mellitus and having a doctor who knew all the kinds of medicines being taken. After being adjusted for confounding variables, the subjects with a doctor who knew all the kinds of medicines they were taking were three times more likely to be adherent to medication (OR 3.01, 95% CI 1.44-6.99).

Conclusion: Receipt of comprehensive medication management services for older people was associated with medication adherence.

Key words: primary care physician, older people, medication adherence, rural area, multiple prescribers

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Introduction

Medication adherence is a growing concern in community health-care teams, especially for those caring for older people[1, 2]. Many older people have multiple medical disorders and sometimes need polypharmacy[3, 4] or see multiple prescribers[5]. Thus, they have an increased risk of overlapping prescriptions or drug interactions[6]. Moreover, older people tend to present with cognitive[7, 8] or swallowing[9] impairment, and they may need medication support to improve medication adherence[10].

Poor medication adherence among older people is a major concern in Japan, as observed in the United States and several European countries[11–13]. In a large-scale community-based cohort study involving 1722 older people with disabilities, Kuzuya *et al.* reported that 12.6% of the subjects were non-adherent (less than 80% of the adherence rate)[2]. Similarly, Origasa *et al*. reported that the overall adherence rate of 9319 Japanese patients with dyslipidemia (aged 60 in average) was 27.5%[14].

Lack of support from close relatives or helpers is reported to be among the main barriers to medication adherence. It was reported that the subjects who did not get assistance with taking medications from others besides a family member were almost 3 times more likely to be non-adherent to prescribed medications than those who got assistance[2].

Assistance from health professionals, especially primary care physicians, is very important to ensure medication adherence among older people[15, 16]. In the framework of the Japanese health care systems, there is no system for officially certifying primary care physicians. Japanese citizens are not required to register with a local primary care physician. Health care is not always offered by a community-based primary care physician, and patients have open access to the entire spectrum of health-care providers—from neighborhood clinics to university hospitals[17]. Patients tend to rely on large-scale hospitals even for routine examinations and minor problems, making unfettered use of costly specialist

services possible.

It is generally perceived that medication management in order people might improve if they had a primary care physician who could comprehensively assess their physical and psychosocial conditions[1, 18]. However, to the best of our knowledge, very few studies in Japan have been conducted to assess if the comprehensive medication management services provided by primary care physicians improve medication adherence among older people.

This study aimed to assess the relationship between receipt of comprehensive medication management services and medication adherence among community-dwelling older people in rural Japan.

Methods

We used data from the Kyushu Asakura Project (KAP), an observational study of all individuals receiving an annual health checkup at a public clinic in Asakura City performed from April 2009 to March 2015. Asakura City is located in a rural plain area in Kyusyu region, Western Japan. Details of the KAP have been published elsewhere [19, 20]. All individuals aged 65 years or older who underwent an annual health checkup at the clinic between 5 February 2013 and 18 March 2014 were included in the study. Among 1197 users who received a checkup during the study periods, 540 (45.1%) users agreed to participate in the present study.

All subjects were requested to respond to a structured questionnaire comprised of questions about such things as age, sex, smoking status, alcohol intake, dietary habits, regular exercise, use of assistive devices, frequency of going out per month, perceived discomforting symptoms, self-reported illness, number of medications being taken, and whether or not they had a doctor who knew all the kinds of medicines the subjects were taking. As for adherence to medication, the subjects were asked the question "Do you always follow your doctor's instructions regarding medication?" The possible answers were "always," "not always but over 80%," and "less than 80%."

Subjects who did not report whether or not they had a doctor who knew all the kinds of medicines they were taking were excluded from the present analysis (n = 43). We divided all the subjects into 2 groups: adherent (always) and non-adherent (not always but over 80% and less than 80%). Only 7 subjects reported their level of medication adherence as less than 80%.

Continuous values are presented as the mean ± SD, and categorical values are presented as percentages. The differences in answers between groups were assessed by using the t-test for continuous values and chi-square test for categorical values. Multivariable adjusted logistic regression analysis was performed to assess the association between the presence of a doctor who was fully responsible for medication adherence and self-reported adherence. Predictors that exhibited significant association (p-value < 0.05) with medication adherence in a univariate analysis were entered in the model as possible confounding factors. The results are presented as odds ratios (ORs) and 95% confidence intervals (CIs).

All statistical analyses were performed with IBM SPSS Statistics 22. A p-value of less than 0.05 is considered statistically significant.

Ethics clearance

This study was approved by the Bioethics Review Committee of Nagoya University School of Medicine (approval number 765). Written informed consent was obtained from all participants.

Results

The characteristics of the study subjects are shown in Table 1. Among the 497 subjects (mean age 73.3) included in the analysis, nearly half were women, and 86.5% were able to walk without any aids. The subjects were taking 4 prescribed medicines on average, and 16.5% were taking a hypnotic. Most of the subjects had a doctor who knew all the kinds of medicines they were taking.

The adherent group included 430 subjects (86.5%), and its members were older than those of the non-adherent group. The reported prevalence of discomforting symptoms such as dizziness, sputum, and palsy was significantly lower in the adherent group compared with the non-adherent group. The reported prevalence of type 2 diabetes mellitus was significantly higher in the adherent group compared with the non-adherent group. The subjects in the adherent group were more likely to eat regularly or have a doctor who knew all the kinds of medicines they were taking.

The crude and multivariable-adjusted odds ratios of medication adherence are shown in Figure 1. After adjustment for age, discomforting symptoms (dizziness, sputum, and palsy), history of diabetes mellitus, and eating regularly, the subjects with a doctor who knew all the kinds of medicines they were taking were 3 times more likely to be adherent to medication (OR, 3.01; 95% CI, 1.44–6.99).

Discussions

A relatively high medication adherence rate was observed among the subjects of the present study, in contrast to previous studies[1, 2, 6–10]. The presence of a doctor who knew all the kinds of medicines they were taking likely contributed to this high adherence.

Table 1 Subject characteristics stratified by adherence level (N = 497)

	Adherence		Non-adherence		p
	n=430	%	n=67	%	
Gender (female)	210	48.8	36	53.7	0.456
Age (mean ± SD)	73.6 ± 5.8		71.2 ± 5.1		0.001
Smoking					
Current	31	7.2	4	6.0	0.699
Ex-smoker	142	33.0	19	28.4	
Nonsmoker	250	58.1	42	62.7	
Drinking					
Everyday	98	22.8	13	19.4	0.192
Sometimes	111	25.8	24	35.8	
Never	216	50.2	28	41.8	
Exercising habit	331	77.0	46	68.7	0.153
Eating regularly	393	91.4	56	83.6	0.017
Walking without auxiliary tool	370	86.1	60	89.6	0.698
Frequency of going outdoors (past month)	349	81.2	54	80.6	0.623
Number of medications (past week; mean ± SD)	3.9 ± 2.5		3.8 ± 2.5		0.661
Taking a hypnotic	73	17.0	9	13.4	0.489
Doctor knows all the kinds of medicines being taken	406	94.4	54	80.6	0.000
Perceived distress symptoms					
Dizziness	20	4.7	8	11.9	0.016
Palpitation/shortness of breath	27	6.3	8	11.9	0.092
Irregular pulse	49	11.4	7	10.4	0.820
Cough/sputum	31	7.2	11	16.4	0.012
Tinnitus	95	22.1	16	23.9	0.744
Sour stomach	40	9.3	9	13.4	0.291
Insomnia	45	10.5	10	14.9	0.279
Pain	40	9.3	5	7.5	0.625
Fatigue	60	14.0	10	14.9	0.832
Palsy	67	15.6	17	25.4	0.047
Dysuria	54	12.6	10	14.9	0.591
Stool abnormality	39	9.1	8	11.9	0.455
Illness					
Stroke	5	1.2	2	3.0	0.239
Heart disease	39	9.1	5	7.5	0.667
Myocardial infarction	8	1.9	1	1.5	0.834
Angina	27	6.3	7	10.4	0.209
Hypertension	202	47.0	24	35.8	0.088
Diabetes mellitus	71	16.5	3	4.5	0.010
Liver disease	17	4.0	4	6.0	0.445
Dyslipidemia	88	20.5	15	22.4	0.718
Hyperuricemia	14	3.3	3	4.5	0.609
Gastric ulcer	33	7.7	8	11.9	0.238
Duodenal ulcer	35	8.1	7	10.4	0.528
Asthma	22	5.1	3	4.5	0.824
Prostatic hypertrophy	36	8.4	3	4.5	0.270

Our results highlight the importance of having a close primary care physician-patient relationship for the optimal level of medication adherence. A number of steps are involved in daily use of medications, including reading and understanding the user information, handling of outer packaging, and completing preparation before use[1]. The involvement of primary care physicians in these steps could help diminish the practical problems related to daily use of medication[18]. Moreover, primary care physicians may play a central role in ensuring coordinated patient care efforts with other service providers, such as specialists and pharmacists.

The relatively low prevalence of established risk factors

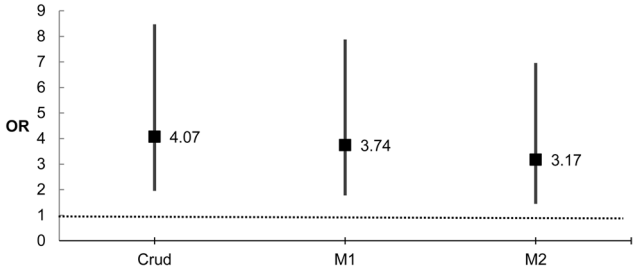

Figure 1 Medication adherence among the subjects with vs without a doctor who knew all the kinds of medicines they were taking (unadjusted and adjusted; OR and 95% CI). An OR greater than 1 indicates that the subjects with a doctor who knew all the kinds of the medicines they were taking were more likely to be adherent to medication. M1: adjusted for age. M2: adjusted for age, dizziness, cough/sputum, palsy, diabetes, and eating habit.

for medication non-adherence among older people, such as polypharmacy, dementia, dependency for activities of daily living, and perceived illness[4, 21–23] might have contributed to the high adherence as well. Most of our study subjects were active participants during their annual health check-ups, were able to respond to the study questionnaire, and were taking less than 4 medications on average.

Our study has several limitations. First, it was conducted at one public clinic. In addition, the subjects were only those who spontaneously showed up for an annual health checkup. Therefore, our findings may not be generalized widely. Second, because this study collected data based on a self-reported questionnaire, there could be reporting and social desirability biases. Third, this study was a secondary analysis of data collected for another purpose, and information on some important variables was lacking.

Conclusions

Having a doctor who knew all the kinds of medicines being taken was strongly associated with medication adherence in the older patients. All doctors and older patients should understand the importance of a comprehensive understanding of medications received from all prescribers in diminishing practical problems such as polypharmacy, failure to take medicines, taking medicine more times than prescribed, and drug interactions.

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