

Brief communication (Original)

Medication nonadherence in elderly patients in a Thai geriatric clinic

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Background: Medication nonadherence is common in elderly patients and is a major cause of morbidity. However, it is not well-described in the literature and to our knowledge has never been studied in Thais.

Objective: To investigate the extent, causes, and contributing factors of medication nonadherence in older patients in a geriatric clinic.

Material and Methods: We conducted a cross-sectional study at Siriraj Hospital, a university teaching hospital in Bangkok. We assessed baseline demographic data, comorbid diseases, Thai Mental State Examination (TMSE), functional status (basic and basic activities of daily living), type and number of medications used, and medication adherence.

Results: There were 153 participants in this study. Medication nonadherence, in the administration of prescribed drugs only, was found in 34% of the participants. Nonadherence to administration of prescribed drugs and to the advice regarding over-the-counter drugs was 42.5%. Nonadherence to the administration of prescribed drugs and to the advice regarding over-the-counter drugs, and herbal and dietary supplements was 54.9%. Three most common causes of medication nonadherence were misunderstanding or lack of the knowledge (25.6%), the development of adverse drug events (18.9%), and because of a suggestion by a friend or family member (16.2%).

Conclusion: Medication nonadherence is common in elderly Thais attending geriatric clinics. We recommend clinicians be aware of this problem and develop a system to improve medication adherence. The clarification of reasons for prescribing is crucial. We recommend emphasis on educating patients, family members, and the public about the risk of nonadherence and of using nonprescribed medications.

Keywords: Adverse drug reaction, elderly, medication adherence

Adverse drug events in the elderly can occur because of several contributing factors. Older people often have multiple coexisting medical problems that lead to polypharmacy. Balance and safe prescribing is difficult to achieve in frail older patients, particularly in those with multiple comorbidities. Other contributing causes are pharmacokinetic and pharmacodynamic changes, reduced body reserve, cognitive impairment, communication problems, and behavioral factors of patients and physicians. Other factors that may affect medication adherence are demographics, medication factors, behavioral factors, and economics [1].

Medication adherence is usually used for prescribed drugs only. However, adherence to advice

regarding over-the-counter (OTC) drugs, herbal products, vitamins and dietary supplements, and life style habits can also affect the efficacy of therapeutic regimens [2]. Consequences of medication nonadherence in older patients can be profound. In patients older than 65 years, 28% of admissions were reported to be drug related, with 11% being the result of nonadherence and 17% caused by adverse reaction [3]. The most common cause of iatrogenic conditions in the older people are related to medication. Older people admitted for longer than 15 days were reported to have iatrogenic misadventures in up to 58%, and 61% of these were preventable [4]. Beijer and de Blaeij estimated that older patients are 4 times more likely to be hospitalized for a medication mishap than those younger than 65 years of age [5]. Medication nonadherence has been reported to range between 26% and 59% in older people [6]. Although it is a common and major cause of morbidity, it is not

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well-described in the literature [7]. Medication nonadherence accounts for 10% of hospital admissions and 23% in nursing home admissions [8]. It often leads to medical and economic consequences. Medication adherence in the aged in Thailand has never been studied to our knowledge. If the extent of the problem and its causes are identified, healthcare providers may be better guided in preventive methods.

In the present study, we sought to fill the gap of existing knowledge and to investigate the extent, causes, and contributing factors of medication nonadherence in the older patients attending our geriatric clinic.

Methods

Participants

We conducted a cross-sectional study at our geriatric clinic. The participants were randomly selected and asked to join the study. Inclusion criteria were: (1) patients aged ≥ 60 years, (2) a Thai Mental Status Examination (TMSE) with score higher than 23 [9], (3) ability to communicate with the interviewer, and (4) those who had a previous diagnosis of dementia or cognitive impairment, or a TMSE with score of 23 or lower, but who had an accompanying caregiver. Ethics approval for this study was obtained from the Institutional Review Board of the Faculty of Medicine, Siriraj Hospital, Mahidol University. Written informed consent was obtained from all study participants or their legal guardians.

Procedure

We assessed baseline demographic data, comorbid diseases, TMSE, functional status (basic and instrumental activities of daily living) [10], type and number of medications used, and medication adherence. Medication adherence was assessed by patient and caregiver self-report. We posed open-ended, nonjudgmental questions "Will you tell me how you take your medications?" This proved to be helpful in soliciting a better response than closed-end, judgemental questions [11, 12]. The participants were asked to bring all their medications; including medications they obtained from other clinics. Pill counts were performed. Data from medical records were also assessed to compare between self-report and actual prescribing. For medications received from our hospital, prescription refill records were also checked [2]. Accompanying informants for the patients were also interviewed to counter-check drug administration data.

We defined medication nonadherence as an error in administration of prescribed drugs. However, because the use of OTC drugs, herbal medicines, vitamins and dietary supplements, and life style habits could affect the efficacy of drug regimens, we also studied their use. We categorized medication nonadherence into 3 groups; (1) nonadherence in the administration of prescribed drugs only, (2) nonadherence in the administration of prescribed drugs and the advice regarding OTC drugs, (3) nonadherence in the administration of prescribed drugs and the advice regarding OTC drugs, herbal medicines, vitamins and dietary supplements.

Statistical analysis

Data were analyzed by SPSS version 17.0. We used descriptive statistics to analyze demographics, the extent of nonadherence (nonadherence in the administration of prescribed drugs plus nonadherence to the advice regarding OTC drugs, herbal medicines, vitamins and dietary supplements) and its causes. Independent *t* tests and Mann–Whitney *U* tests were used to compare variables between adherence and nonadherence groups. Chi-square tests was used to compare categorical variables between the two groups.

Results

There were 153 participants in this study. Overall, the median number of medications used was 7. Polypharmacy, consisting of ≥ 4 drug items, was identified in 90.8% of the patients and 77.6% of the participants receiving at least 5 medications. Most of the patients (81.7%) managed their own medications. **Table 1** shows a comparison between baseline characteristics of the patients in both adherence and nonadherence groups. There was no statistical difference between participants in adherence and nonadherence groups (including prescribed drugs, OTC drugs, herbal medicine, vitamins and supplements) in terms of age ($P = 0.107$), sex ($P = 0.309$), educational level ($P = 0.053$), number of comorbid conditions ($P = 0.339$), number of concurrent medications ($P = 0.322$), those independent in self-care ($P = 0.704$), and TMSE score ($P = 0.469$). Over the counter drugs, herbal medicine, and vitamin and supplement use were found in 13.7%, 17.6%, and 12.4% of the patients. Medication nonadherence in the administration of prescribed drugs only was found in 34% of the participants. There were 42.5% of the

patients who did not use medications as prescribed; this excluded herbal medication use. There were 54.9% of the participants who were classified as nonadherent in the administration of prescribed drugs plus nonadherence to advice regarding herbal medicines, vitamins and dietary supplements (**Table 2**). The most common type of medication nonadherence was the use of prescribed medication, which accounted for 43.9%, followed by “not use the prescribed medication (35.7%)”. Use of prescribed medication, but practice of self adjusting of the dose was noted in 20.4% (**Table 3**).

Medications with the most nonadherence were vitamins and calcium (23 cases), antihypertensives (11 cases), central nervous system medications (9 cases), antidiabetics (5 cases), cardiac medications (4 cases), and NSAIDS (4 cases).

Three most common causes of medication nonadherence were misunderstandings or a lack of knowledge and awareness of why they were prescribed (25.6%), the development of the adverse drug events (18.9%), and suggestions of a friend or family member (16.2%). **Table 4** summarizes the reasons of nonadherence.

Table 1. Participant demographic data

Characteristics	Adherence (n = 69)	Nonadherence (n = 84)
Age (mean ± SD), years	77.5 ± 6.0	75.8 ± 6.9
Female	65.2%	57.1%
Marital status (single/divorced/separated/widow)	50.7%	46.4%
Education >primary school	55.1%	70.2%
Totally independent in self-care	75.4%	81.0%
Need a caregiver in handling drug administration	18.8%	17.9%
Thai Mental Status Examination (mean ± SD)	27.5 ± 2.5	27.2 ± 2.9
Number of comorbid diseases (mean ± SD)	5.0 ± 1.6	4.8 ± 1.7
Number of drug use (median, IQR)	7.4 ± 3.2	6.9 ± 3.1
Prescribed medication ≥4 items	91.3%	90.5%
Prescribed medication ≥5 items	81.2%	75.0%
Receiving treatment only in one clinic (geriatric clinic)	17.4%	10.7%
Over-the-counter drug use	0	13.7%
Herbal medicine use	0	17.6%
Supplement use	0	12.4%

*NA = not available

Table 2. Type of medication nonadherence

Medication nonadherence	Prevalence
(1) Nonadherence in the administration of prescribed drugs only	34%
(1)+(2) Nonadherence to advice regarding OTC drugs	42.5%
(1)+(2)+(3) Nonadherence to advice regarding herbal medicine, vitamins and dietary supplements	54.9%

Table 3. Type of nonadherence

Type of nonadherence	Percentage
Use nonprescribed medications	43.9%
Not use prescribed medication	35.7%
Use different dose of prescribed medication	20.4%

Table 4. Reasons for nonadherence

Reasons of nonadherence	Percentage
Misunderstanding, lack of awareness, or knowledge or beliefs	25.6%
Adverse drug events developed	18.9%
Suggestion from friends or family members	16.2%
Administration difficult to follow in real practice	5.4%
Medication not effective	5.4%
No caregiver to manage medication	5.4%
Advertising in public media	4.1%
Others	18.9%

Discussion

Medication nonadherence is common in elderly Thai patients even in a geriatric clinic where education of patients is generally better. We checked all medications of the patients, not just medications prescribed by our clinic. However, prevalence of medication nonadherence is still unexpectedly high and close to that previously reported in other studies [6]. Geriatric clinic patients are old, have multiple comorbidities, and receive polypharmacy leading to an increase in nonadherence. However, the most common type of medication misuse in our study was “use of nonprescribed medications from other sources”. Reasons for the nonadherence are misunderstanding and a lack of knowledge, and also the influence from friends and family as well the availability of many potent pharmaceuticals without prescription at many local pharmacies.

Nonadherence by patients is not often checked when they visit their physician. A recent systematic review showed that nonadherence in the elderly is not well described in the literature despite being a major cause of morbidity [7]. Clinicians who rely on self-reports from patients and caregivers to assess medical adherence may underestimate this important problem. Healthcare professionals usually ask a single closed-end, judgmental questions such as: “Do you take your medicines as prescribed?”. This is not adequate in assessing adherence and has proven to be unreliable [11, 12]. We recommend clinicians check multiple sources such as more detailed caregiver reports, prescription refill records, pill counts, and ask patients how they take their medications as well as whether they use over-the-counter medications, herbal medicines, or dietary supplements including vitamins.

This study has limitations. First, the cross-sectional study design and self-reported nature of the data can result in potential bias. We endeavored to use multiple

data sources; pill counts, caregiver reports, and the demonstration of how to use medications in an effort to compensate for these pitfalls. Second, the population characteristics of patients in a geriatric clinic might be different from older patients in other settings such as outpatient clinics of government hospitals or private practices. Our patients had multiple comorbidities and 90.8% received at least 4 prescribed medications. They tended to be more educated than the general older population. Most of the patients’ caregivers were also well educated. The majority of patients received reimbursement of their medical expenses from the government or health insurance. These differences might affect adherence outcomes. Third, limitations of sample size might reduce power of and contribute to the lack of significance in statistical comparisons. Finally, as we excluded those with a TMSE of 23 or less with no accompanying caregiver, the real proportion of the medication nonadherence in the elderly patients is likely to be higher than what we found. Subjects with cognitive impairment are more likely to have errors in using their medication. However, patients with cognitive impairment are more likely to have an effective caregiver to handle their medication needs and the proportion of nonadherence might then not be as high as expected.

We recommend every clinician dealing with older patients develop a system to improve medication adherence and we propose some strategies. First, all levels of health care providers should understand the prevalence and importance of this problem and raise their awareness of it. Second, several methods should be used, including an analysis of self-reports by patients and caregivers, pill counts (clinic and at home), occasional urine and serum drug concentrations tests where possible, clinical measures (e.g. blood pressure, serum lipid levels, blood sugar, viral load, and depression symptoms), and prescription refill

data. Some medications, which are specially designed to help memory and can be checked by patients, caregivers, and clinicians are useful. Third, every patient with potential risk factors that affect medication adherence, such as multiple comorbid diseases, polypharmacy, cognitive impairment, physical disabilities, or lack of caregiver support, should be carefully monitored as to adherence. Fourth, good prescribing habits by clinicians, such as regular medication review, using a simple drug regimen, once daily dose prescribing wherever possible, limitation of the number of clinicians prescribing for each patient, is important and must be stressed; particularly for health care staff that deal with elderly.

Finally, our study shows that major causes of medication nonadherence are misunderstanding and lack of adequate communication between physician/nurse and patients and resulting in a lack of needed awareness or knowledge, adverse drug reactions which develop, and inappropriate suggestions by friends or family members. We recommend clarifying why drugs are being prescribed and the health care risks of not taking the medications, or taking them irregularly or as an overdose be explained to the patient and caregiver. The caregiver should also be instructed to pass this information to the patient's family. The caregiver should also be made aware that restriction of OTC drugs might reduce nonadherence to prescribed drugs.

The authors have no conflicts of interest to declare.

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