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ORIGINAL ARTICLE

Effectiveness of the medication safety review clinics for older adults prescribed multiple medications

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Background/Purpose: Polypharmacy is common among Taiwanese older adults. We aim to determine the effectiveness of the medication safety review clinics (MSRCs) for solving drug-related problems (DRPs) among older adults prescribed multiple medications.
Methods: This prospective case-series intervention study was conducted at the outpatient department of the National Taiwan University Hospital and its BeiHu Branch. Older adults (≥65 years) who either had been prescribed ≥8 chronic medications (drugs prescribed for ≥28 days) or had visited ≥3 different physicians during the 3-month screening period were enrolled ($N = 193$). DRPs were identified after baseline assessments from a team of geriatricians and pharmacists. Prescribers were contacted with proposed interventions to be administered within 12 weeks. Problem-solving rates (PSRs) at both Week 12 and Week 24 visits were recorded. Stepwise multivariate logistic regression was applied to identify correlates of having at least one unsolved DRP at 24 weeks. Participants ($N = 139$) who completed four visits to the MSRCs were analyzed.
Results: The mean age was 75.6 ± 6.1 years and 56% of them were men. The mean chronic medication per patient was 9.0 ± 3.1, and the mean DRP per patient was 2.1 ± 1.5.

Conflicts of interest: The authors have no conflicts of interest relevant to this article.

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The PSR was 76% at Week 12 and 87% at Week 24. Thirty-two patients (22%) had at least one unsolved DRP. Correlates of the unsolved DRP included a higher geriatric depression scale, a higher chronic medication per patient, and a higher DRP per patient. The mean chronic medication per patient (9.0 vs. 8.6, $p < 0.05$) decreased, and the number of participants rating good or better health status improved from 22% to 38% in 24 weeks ($p < 0.001$). Participants were highly satisfied (96% at all times) with the service.
Conclusion: DRPs were common in geriatric outpatients taking multiple medications and most were solved with appropriate interventions. The MSRC service may improve prescription quality in Taiwan if widely available.

Introduction

Polypharmacy has been a major concern in Taiwan, with one-third of frail elders being prescribed more than five medications for more than 180 days in 1 year.[1] Polypharmacy makes older Taiwanese adults highly susceptible to drug-related problems (DRPs). DRP is defined as "an event or circumstance involving drug therapy that actually or potentially interferes with desired health outcomes."[2] There are many classification systems for DRP designed to be applied in clinical practice. Pharmaceutical Care Network Europe (PCNE) classification was considered an optimal system based on five major requirements.[3]

There is a lack of medical review service in Taiwan to detect and solve DRPs among older adults.[4] Communication between pharmacists and prescribers can be improved by including geriatricians with a strong medication review training background.[5] Therefore, a "medication safety review clinic" (MSRC) established under collaborative efforts between geriatricians and clinical pharmacists is probably a more ideal model in Taiwan. The purpose of this study is to measure the effectiveness of MSRC and provide suggestions for implementation of similar services in Taiwan.

Patients and methods

Design of MSRCs

Our research on MSRCs was performed at the outpatient departments of the National Taiwan University Hospital (NTUH) and its affiliated community hospital, its BeiHu Branch. This work was supported by the Taiwan Department of Health grant "Medication Safety Review Clinic in Taiwanese Elders" and was approved by the institutional review board at the NTUH in October 2007.

The clinic opened weekly at each participating hospital. For each clinic session, one to two research assistants, one clinical pharmacist, and one geriatrician were responsible for collecting clinical and drug information, performing assessments, formulating care plans, and monitoring outcomes during the 24-week study period.

Each participant visited the clinic four times, including initial, 3rd week, 12th week, and 24th week visit. Informed consents were obtained at the baseline visit (with roughly 1-hour assessment). In-depth comprehensive geriatric assessments, including physical, psychological, and functional status, were performed by history taking, physical examination, and assessments with special instruments (detail described elsewhere).[6] Medication reviews were also performed to identify DRPs by collaboration of one geriatrician and one clinical pharmacist, using the instruments described later. Interventions were proposed by the research team to the prescriber and/or patient. For example, if the problem is poor adherence, the team confirmed the indication and reinforced the importance of medication adherence to the patient. The clinic was designed to coordinate but not to substitute the original care. Prescribers ($N = 139$) were called by the geriatricians in the research team to create mutually agreed interventions to be presented to participants at the 15-minute Week-3 visits. Nearly 10% ($N = 15$) of the prescribers were not affiliated with the NTUH healthcare system. Participants were expected to see their prescribers at least once in 12 weeks because of the National Health Insurance (NHI) regulations. Unless immediate action was necessary to protect patient safety, all drug-level interventions were implemented at the next scheduled visit by the prescriber, with reminder notes attached to the medical records by the research team. For non-NTUH system prescribers, reminder notes were mailed or faxed to their offices. The Week-12 visit also took about 15 minutes to determine the initial problem-solving rate (PSR) and to identify new problems based on the interval clinical condition and medication changes. Prescribers were contacted again for new or unsolved DRPs. The final PSR was determined at the 40-minute Week-24 visits. Some standardized geriatric assessments performed at baseline visits were repeated to evaluate interval changes (Fig. 1). Overall, this study was designed as a prospective case-series intervention to detect and solve DRPs.

Participants

Our target population was geriatric (aged $\geq$65 years) outpatients who either had been prescribed $\geq$8 chronic medications (drugs prescribed for $\geq$28 days) or had visited $\geq$3 different physicians at the two participating hospitals in 3 months prior to October 2007. The second criterion was selected because past research showed that multiple prescribers significantly increased the risk of polypharmacy.[7–9]

Twenty-eight core physicians were invited to refer their patients to the MSRCs. Of the 668 patients whose contact phone numbers were provided to the research team, 285