



Social network analysis of duplicative prescriptions: One-month analysis of medical facilities in Japan



Yoshimitsu Takahashi^{a,b,*}, Tatsuro Ishizaki^c, Takeo Nakayama^a, Ichiro Kawachi^b

^a Department of Health Informatics, Kyoto University School of Public Health, Yoshida-Konoe, Sakyo, Kyoto 606-8501, Japan

^b Department of Social and Behavioral Sciences, Harvard T.H. Chan School of Public Health, 677 Huntington Ave, Boston, MA 02115, USA

^c Research Team for Human Care, Tokyo Metropolitan Institute of Gerontology, 35-2 Sakae, Itabashi, Tokyo 173-0015, Japan

ARTICLE INFO

Article history:

Received 27 April 2015

Received in revised form 16 January 2016

Accepted 22 January 2016

Keywords:

Prescription drugs

Health service research

Health policy

Social networks

Duplicative prescription

ABSTRACT

Objectives: Duplicative prescriptions refer to situations in which patients receive medications for the same condition from two or more sources. Health officials in Japan have expressed concern about medical “waste” resulting from this practices. We sought to conduct descriptive analysis of duplicative prescriptions using social network analysis and to report their prevalence across ages.

Methods: We analyzed a health insurance claims database including 1.24 million people from December 2012. Through social network analysis, we examined the duplicative prescription networks, representing each medical facility as nodes, and individual prescriptions for patients as edges.

Results: The prevalence of duplicative prescription for any drug class was strongly correlated with its frequency of prescription ($r=0.90$). Among patients aged 0–19, cough and colds drugs showed the highest prevalence of duplicative prescriptions (10.8%). Among people aged 65 and over, antihypertensive drugs had the highest frequency of prescriptions, but the prevalence of duplicative prescriptions was low (0.2–0.3%). Social network analysis revealed clusters of facilities connected via duplicative prescriptions, e.g., psychotropic drugs showed clustering due to a few patients receiving drugs from 10 or more facilities.

Conclusion: Overall, the prevalence of duplicative prescriptions was quite low – less than 10% – although the extent of the problem varied by drug class and age group. Our approach illustrates the potential utility of using a social network approach to understand these practices.

© 2016 Elsevier Ireland Ltd. All rights reserved.

* Corresponding author at: Lecturer, Department of Health Informatics, Kyoto University School of Public Health, Yoshida-Konoe, Sakyo, Kyoto, 606-8501, Japan. Tel.: +81 75 753 9477; fax: +81 75 753 9478.

E-mail addresses: y-takahashi@umin.ac.jp (Y. Takahashi), tatsuro@tmig.or.jp (T. Ishizaki), nakayama.takeo.4a@kyoto-u.ac.jp (T. Nakayama), ikawachi@hsph.harvard.edu (I. Kawachi).

1. Introduction

Duplicative prescriptions refer to situations in which patients receive prescriptions for the same condition from two or more sources. The Japanese Ministry of Health, Labour and Welfare (MHLW) previously expressed concern about medical “waste” stemming from this practice. [1,2]. The concept of duplicative prescriptions is similar to redundant medications [3], doctor/hospital shopping [4,5],

multiple providers [6], and wandering patients [7]. Patients who receive medical care from different medical facilities are more likely to receive duplicate prescriptions and to suffer adverse drug reactions [4,8,9]. From the perspective of therapeutic safety and excess expenditures, duplicative prescriptions are classified as a type of inappropriate prescription practice [10]. Physician shopping, i.e., seeking care from multiple doctors without professional referral for the same or similar illness conditions, is a common problem in some Asian countries [4,10,11]. Among outpatients in Japan, 5.8% people self-reported that they visited multiple medical facilities for the treatment of the same conditions [12].

The issue of duplicative prescription has focused on several drugs and diseases. Concurrent opioid prescribing by multiple providers is common [6,13–15]. A growing number of narcotic abusers obtain narcotic prescriptions from multiple providers [16], and clinical guidelines have recommended that monitoring programs be implemented in order to provide data on patterns of prescription usage, as well as to reduce drug abuse and doctor shopping [17]. Inappropriate prescriptions of psychotropics in the elderly are also likely to involve multiple prescribers and pharmacies [18]. In Japanese universal health coverage system [19], free access to any hospital or clinic is guaranteed, patients frequently visit multiple medical institutions [20]. According to one survey in Japan, 7 out of every 10 welfare recipients who needed psychoactive drugs and visited multiple medical facilities were inappropriately prescribed these drugs, with most receiving two prescriptions for the same symptoms [21]. According to media reports, some of these patients were caught reselling these drugs on the street as a way of earning extra cash [22].

Polypharmacy refers to the prescription of multiple drugs for the same patient, and is most commonly seen in elderly patients [23]. The practice is associated with excess cost as well as heightened risk of adverse drug–drug or drug–condition interactions [24,25]. Elderly patients are far more likely to experience adverse effects from their prescribed regimens, causing considerable morbidity or mortality [26]. In order to study inappropriate prescribing practices (including duplicative prescriptions and polypharmacy), comprehensive patient-level data are needed. However, little is known about multiple prescriptions issued from multiple medical facilities for different classes of drugs. Moreover, there are few data which permit us to examine duplicative prescription practices from the viewpoints of both patients and facilities. One analytical approach to understand this problem is the use of social network analysis [27–29]. According to this approach, facilities are represented as the “nodes” of a prescribing network, and facilities connected by patients receiving duplicative prescriptions are represented as “edges”.

In this analysis using a large prescription database, we sought to provide a descriptive epidemiology of duplicative prescription practices among outpatients in Japan utilizing social network analysis, and to report their prevalence of duplicative prescriptions across ages.

2. Methods

2.1. Study design and data source

We used health insurance claims data provided by the Japan Medical Data Center Co., Ltd. (JMDC). In turn, JMDC obtained claims from several employee-based social health insurance plans in order to construct the JMDC medical database (JMDC-MDB) [30–32]. We analyzed the cross-sectional data based upon 1,243,058 insured people and their dependents during the month of December 2012. Among them, both healthy individuals and patients were included. The Institutional Review Board of the Kyoto University Graduate School and Faculty of Medicine Ethics Committee approved the study protocol (E1893).

2.2. Measures and definition of duplicative prescriptions

All prescriptions in the database were categorized according to the Anatomical Therapeutic Chemical Classification (ATC) System [33,34]. The ATC is a hierarchical coding system used in many databases throughout the world [35]. We considered duplicative prescriptions as situations in which patients received prescriptions in a main therapeutic group (ATC code 2nd level, first 3 digits) from two or more sources during the same month of December 2012. Alternative definitions of duplicative prescriptions have been proposed. In one study, duplicative prescription was narrowly defined as a situation in which drugs with the same mechanism of action (448 categories) were administered to the same patient simultaneously for one or more days by multiple medical institutions [10]. Another study defined duplicative prescriptions as a situation in which two medications within the same pharmacological subgroup (3rd level of ATC codes) were prescribed to the same patient during a 3 month period [4]. Japanese health officials have illustrated duplicative prescriptions as a situation in which “the same patient received prescription drugs with a similar mechanism of action from two or more facilities during a one month period” [2]. In the current study, we adopted the broader definition provided by Japanese health officials.

2.3. Statistical analyses

We defined the prevalence of a medical condition/complaint (e.g., hypertension) as the number of patients prescribed a particular class of drug divided by the number of total study number (insured people), i.e., $(N \text{ of } P)/(N \text{ of } T)$. For each class of drug, the frequency of duplicative prescription was derived as the number of patients receiving duplicative medication divided by the total number of patients receiving that class of drug, i.e., $(N \text{ of } DP)/(N \text{ of } P)$. We examined the correlation between the prevalence of each medical condition/complaint versus the frequency of duplicative prescription using scatter plots and the Pearson correlation coefficient. We conducted subgroup analysis by age group (ages 0–19, 20–39, 40–64, and 65 and over).

Download English Version:

<https://daneshyari.com/en/article/6239125>

Download Persian Version:

<https://daneshyari.com/article/6239125>

[Daneshyari.com](https://daneshyari.com)