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Incidence of Drug Related Problems in Outpatient Setting: A Review Article

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ABSTRACT

Detection and resolution of Drug Related problems (DRPs) are one of the most important parts of Pharmaceutical care. As many as 4.6% of deaths in the United States may be the result of a DRPs, making DRP one of the top 5 leading causes of death. According to the high prevalence of DRPs in an outpatient setting, lack of information about this setting rather than inpatient setting and the importance of detection and resolution of them, reviewing the articles in this regard is necessary. In this review article, PubMed, Scopus, and Google scholar databases were used for finding the relevant studies about the prevalence of DRPs in an outpatient setting and ambulatory care services. In the past 20 years the incidence of drug-related drug problems in the ambulatory care unit has increased and it's more important in the elderly patient due to pharmacokinetic changes and polypharmacy. Patients with cardiovascular diseases or diabetes mellitus and patients who require chronic pain management are important target groups for DRP Screening. The lack of medication counseling in ambulatory care and in pharmacy settings are an important cause of DRPs in an outpatient setting. According the knowledge about physiology, pharmacology and toxicology, pharmacokinetics and Pharmacotherapy, the most qualified health care provider for detection and management of DRPs in the outpatient setting is pharmacist Quality improvement programs in the base of pharmaceutical care, such as medication therapy management service should target DRPs, especially for patient groups using cardiovascular drugs, analgesics, hypoglycemic agent's and anti-Seizure agents.

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Introduction

Detection and resolution of Drug Related problems (DRPs) are one of the most important parts of Pharmaceutical care (1). A drug related problem (DRP) is any undesirable event experienced by a patient that involves, or is suspected to involve, pharmacotherapy, and that interferes with achieving the optimum goals of therapy and requires professional judgment to resolve (2). DRPs are a common; As many as 4.6% of deaths in the United States may be the result of a DRPs, making DRP one of the top 5 leading causes of death (3). In the Ambulatory Care setting, 70% of outpatient clinic visits associate with the prescription or continuation of a

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medication (4,5). Research has shown annually more than 700000 patients are treated in emergency departments for DRPs (6). in 1994 more than 1 million patients in the ambulatory care setting experienced DRPs that need hospitalization, and that 4.7% of admissions were caused by medications (7). Ambulatory care patients run a significant risk of experiencing DRPs. A large proportion of these DRPs are preventable, and nearly half of the preventable DRPs require hospitalization (8). According to the high prevalence of DRPs in an outpatient setting, lack of information about this setting rather than inpatient setting and the importance of detection and resolution of them, reviewing the articles in this regard is necessary.

Methods

In this review article, PubMed, Scopus, and Google scholar databases were used for finding the relevant studies about the prevalence of DRPs in an outpatient setting and ambulatory care services. Keywords included drug related problems, adverse drug events and outpatient setting. Articles included inpatient setting and hospital admission keyword excluded. Finally, after exclusion of 5 articles, 10 articles including two systematic review were selected and their results were examined.

Findings

Studies have shown that the incidence of DRPs in the ambulatory care unit has increased between 1995 and 2005. (From 9.1 to 16.9 per 1000 persons). It's more important in the elderly patient due to pharmacokinetic changes and polypharmacy. The incidence of DRPs among elderly (65 years old and older) increased from 32.7 visits per 1000 persons to 48.8 visits per 1000 persons. The number of patients who take five or more medication doubled between 1995 and 2005. The highest proportion of DRP visits resulting hospitalization was related to glycosides such as digoxin (12.8%; CI: 8.6-18.6%), anticoagulants (11.2%; CI: 7.5-16.3%), anticonvulsants (7.0%; CI: 4.4 -11.1%), and antineoplastic (6.5%; CI: 3.7-11.2) (3).

A cohort study was done on the 167 high risk (taking 5 scheduled medications) ambulatory older patients reported that the most common drug classes for DRPs were cardiovascular (33.3%), CNS drugs (27.8%), musculoskeletal (9.7%), respiratory (5.6%), endocrine (4.2%), gastrointestinal (2.8%), and miscellaneous (16.7%). Fifty-eight (35%) of 167 patients experienced DRPs.68% of medications associated with DRPs need adjustment and discontinuation. 95% of DRPs were categorized as type A or predictable reactions are preventable (9).

In a study of 2248 outpatients 20 to 75 years old, 394 (18%) patients taking drugs reported adverse drug reaction (Not DRP) with their prescription medications. On chart review, evidence of an ADR was found in only 64 (3%) of 2248 patients. All 64 events were verified as adverse drug events using the Naranjo technique. The most common drug classes were antibiotics (21%), antidepressants (13%), and NSAIDs (6%). The most frequently reported side effects were gastrointestinal symptoms, sleep Disorder, fatigue, and mood changes respectively (10).

In another prospective cohort study of the 661 patients in the outpatient setting, 181 (27%) had DRPs. The number of medications had a direct relationship to DRPs. The mean number of DRP occurrence per patient increased by 10 percent for each additional medication. The most frequent DRPs involved CNS (33%), gastrointestinal system (22%), and cardiovascular system (18%). Classes of medications with the highest DRPs rates were SSRIs (10 percent), beta-blockers (9 percent), ACEIs (8 percent), and NSAIDs (8 percent), respectively. Finally 39 percent of adverse drug events in primary care were either preventable or ameliorable (11).

In the Secondary data analysis study in the United States, the number of medications was the most important cause of DRPs. At physiologic level, the use of multiple medication and over-the-counter drugs increases the potential for drug–drug interactions and difficulties with self-administration (12).

A systematic review of the DRPs in outpatient setting, determined DRP preventability rate of 21%. Preventability rate in the outpatient setting appears to be lower than preventability rates found in other settings. The incidence of DRPs resolved in ambulatory care was higher than those requiring hospital admissions. Among drug classes a large part of the drug related death associated to cardiovascular drugs. three drug groups were responsible for more than 86% of DRPs, Thus, based on these data, patients with cardiovascular diseases or diabetes mellitus and patients who require chronic pain management are important target groups when planning quality improvement interventions aimed at preventing DRPs. DRPs occur frequently in the prescribing and monitoring stage of the medication use process, and optimization of drug prescribing and patient monitoring is critical for medication safety interventions in the outpatient setting (8).

In another systematic review the incidence of DRPs in the ambulatory care unit (20.1%) is higher than the inpatient setting (8.65%) confirm that DRPs in outpatients are very common and contribute to iatrogenic morbidity. For elderly patient, up to 30% of hospital admissions are related to DRPs. Polypharmacy, difficulty using medications, age-related pharmacokinetic and pharmacodynamics changes, place older adults at high risk for DRPs. DRP Incidence rates were lowest for children, because of their variable size and physiology, children are vulnerable to under- and overdosing. Factors leading to DRPs in this population include the need for individualized dosing based on age, weight, or body surface area, which increases the risk for DRPs. cardiovascular, anti-infective, and analgesic medications most frequently associated with DRPs.

Sixteen to 41.5 percent of these DRPs are due to error and are thus preventable (13).

The reported incidence of pediatric hospitalization related to DRPs ranged from 0.59 to 4.1% among the studies. A large part of the DRPs in children due to off label indications. Studies indicated many children receive medications without labelling. Pediatricians, clinical pharmacists and other caregivers in pediatrics care setting should be involved themselves in any such effort such as information, communication, and education concerning the rational use of drugs in children (14).

In another cohort study among 30397 older patients, there were 1523 identified DRPs, of which 27.6% (421) were considered preventable. The overall rate of DRPs was 50.1 per 1000 person-years, with a rate of 13.8 preventable DRPs per 1000 person-years. Cardiovascular medications (24.5%), diuretics (22.1%), NSAIDs (15.4%), antidiabetic agents (10.9%), and anticoagulants (10.2%) were the most common drug classes associated with preventable DRPs (15).

Discussion and Conclusion

In the ambulatory care setting, Incidence DRPs is 25%. Approximately 39% of these ADEs are preventable (11). Detection and resolution of DRPs in the ambulatory setting are more difficult because of the use of multiple setting (laboratories, pharmacies, and specialty services) in patient care. Information on the outpatient setting DRPs is much less than the Inpatient service unit. The most important reasons for this are the use of over the counter drugs, self-management, less physician-patient communication and lack of documentation systems. Studies have documented the lack of medication counseling in ambulatory care and in pharmacy settings are an important cause of DRP in an outpatient setting. Due to the prevalence of chronic diseases and the aging of societies, the DRPs have increased. Education about these commonly prescribed medications and increased monitoring for side effects could benefit physicians and patients. According the knowledge about physiology, pharmacology and toxicology, pharmacokinetics and pharmacotherapy, the most qualified health care provider for detection and management of DRPs in the outpatient setting is pharmacist. By increasing the pharmacists' services in this setting DRPs can be reduced. None of these articles used a comprehensive system for classification, documentation and identification of DRPs, and there is no similar study in Iran for this purpose. It seems that by designing a comprehensive system for documentation and classification of DRPs in an outpatient setting, these problems can be identified and measured. Quality improvement programs in the base of pharmaceutical care, such as medication therapy management service should target DRPs, especially for patient groups using cardiovascular drugs, analgesics, hypoglycemic agent's anti-epileptic agents.

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