



Polypharmacy and Treatment Difficulties in Patients undergoing Chemotherapy

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Abstract

Hemodialysis patients frequently experience polypharmacy. Medication-Related Problems (MRPs), expenditures, and increased hospital admissions are all linked to it. The prevalence of polypharmacy in our setting is poorly documented. The purpose of this study is to examine the predictors of polypharmacy and MRPs and their prevalence. In the outpatient hemodialysis unit, a cross-sectional study was carried out by us. Over the course of three months, a resident in pharmacy examined electronic prescribing records to identify MRPs and discussed therapeutic interventions to enhance effective therapeutic regimens. There were 83 patients included. The median age (interquartile range) was 63. IQR = 22), and the mean number of co-morbidities was 3.14 1.64. Half of the participants were male. The 95% confidence interval (CI) for polypharmacy was 96.7 percent (91.6%–99.7%). The highest MRPs were found to be medication use without a prescription, at 36% (102/280), subtherapeutic dosing, at 23% (65/280), and overdosing, at 15% (41/280). The primary factors that were used to predict an increase in the number of medications were the presence of respiratory conditions, ischemic heart disease, and comorbidities. The Saudi hemodialysis population has a high rate of polypharmacy. The identification of MRPs and the opportunities for deprescribing to optimize medication use and reduce polypharmacy in hemodialysis patients were facilitated by a review of the medications prescribed by the pharmacist.

Keywords: Problems with drugs, Problems with medications, Pharmacist, Polypharmacy, Haemodialysis

INTRODUCTION

End-Stage Renal Disease (ESRD) is a global issue affecting public health. Out of Saudi Arabia's total population of 30,770,475 people, 4177 had recently been diagnosed with dialysis; 136 PMP (Per Million Population) was the prevalence. By the end of 2016, the Saudi Centre for Organ Transplantation (SCOT) registry data indicated that 16,315 patients were receiving hemodialysis (HD) (Holden MG et al., 2013).

Patients with ESRD experience a variety of kidney failure-related complications, including; hypertension from excess fluid; anemia; hyperparathyroidism secondary; uremic pruritus, in addition to other chronic comorbidities that necessitate the use of multiple medications and carry a higher risk of medication errors, Additionally, Saudi Arabia's

elderly population is growing at the same time as the expected rise in dialysis use and prevalence. This further complicates the process of prescribing medications to those patients. Aside from nephrologists and the use of over-the-counter (OTC) medications, dialysis patients take an average of 4.7 medications from 2–9 healthcare providers, which explain the high rate of polypharmacy in this population (Warny MG et al., 2005).

In the literature, polypharmacy has been defined as the use of between four and five medications without regard to a clinical indication, which can result in a number of medication-related issues (MRPs). As a result, patient safety suffers. Patients with chronic kidney disease were found to have a variety of MRPs, including 1) symptoms not treated; (2) utilizing the wrong medication; 3) improper

drug administration 4) side effects from medications; 5) interactions between drugs; (6) adherence; (7) Using drugs without a prescription MRPs may cost the healthcare system money and cause an increase in hospital admissions, morbidity, and mortality. As a result, multidisciplinary team rounds, which include pharmacists, have been reported in the literature to minimize polypharmacy and maximize patient adherence to medications and dietary regimens (Kuijper EJ et al., 2006).

Through a structured review of a patient's medication list, pharmacists are trained to identify MRPs and communicate with doctors to find therapeutic alternatives or to deprescribe unnecessary medications to reduce polypharmacy. According to a number of studies, pharmacists play a crucial role in identifying MRPs associated with polypharmacy and suggesting the most effective interventions to improve patient outcomes (LeroyJ et al., 2011).

We are aware of very little information regarding the prevalence of polypharmacy and its impact on MRPs among Saudi hemodialysis patients. Therefore, the purpose of this study is to ascertain the prevalence of medication-related problems and polypharmacy among hemodialysis patients.

METHODS

The following methods were used to collect data: examining patient records; medications, electronic medical records; and through the pharmacy resident's discussions with treating physicians between December 2010 and February 2011.

The pharmacy resident looked through electronic medical records to figure out how many medications were given and to look for baseline demographics, comorbidities, and clinical lab results. The generic name(s) for the active ingredient(s) were used to record medications in our electronic records, and medications that contained combinations were treated as single drugs. In addition, the Micromedex® drug information databases were used to categorize the severity of drug–drug interactions, and each medication regimen for eligible patients was analysed for MRPs. The analysis was based on whether or not: Dosing; repetition of treatment; events caused by drugs; limitations on its use; and, based on the clinical history documented by physicians in the medical charts and the laboratory results reported in the electronic healthcare system, whether laboratory parameters were required for the monitoring of drugs and their appropriate use. There were four levels of severity for drug–drug interactions: minor, moderate, major, and contraindicated (Slekovec et al., 2014). These are their definitions:

Minor: Has no clinical effects and does not necessitate therapy modification. The interaction might make the patient's condition worse or force them to change their treatment. Contraindicated: The interaction may be life-threatening and/or necessitate medical intervention to minimize or prevent serious adverse events. In our study, we

focused on the potentially significant drug–drug interactions that necessitated interventions of moderate, major, and contraindicated levels. The attending physician and the pharmacy resident discussed the suggested therapeutic interventions, such as: halting medication use; adjusting the dose of the drug; the system of management; and switching to new, non-prescription drugs. If the attending physicians agreed, these therapeutic interventions were put into action by issuing medication orders to improve the patient's medication regimens. The number of interventions that were accepted was then recorded. During the course of the study, neither the pharmacy resident nor the three attending physicians underwent any changes (Langford BJ et al., 2016).

DISCUSSION

The prevalence of polypharmacy among outpatient hemodialysis patients was the primary outcome. At the time of data collection, polypharmacy was defined as taking more than five prescribed medications per day (Peterson et al., 2005).

According to the findings of previous studies, a variety of MRPs were among the secondary outcomes. These are some: use of medication without a prescription; improper drug administration, either in excess or below the recommended dosage; indication that cannot be treated; medications in duplicate; contraindications; tests in the lab that are necessary for monitoring; recommendations for alternative medications; and interaction between drugs. MRPs included drug–drug interactions that necessitated further action on the part of the prescriber. The proportion of suggested interventions that were accepted by treating physicians and the factors that determined the mean numbers of medications are two additional secondary outcomes (Peterjack et al., 2006)

184 drug–drug interactions were found, and they were categorized according to their severity as follows: 58% moderate (106); major 41% (76); likewise, 1% contraindicated. The following were the most frequently encountered drug–drug interactions: 10% of antidepressants (19); 8 percent antiplatelet drugs (15); 7% inhibitors of the proton pump (13); and 2% of statins

For each of the 280 identified medication-related issues, the resident pharmacist recommended a total of 280 interventions. The median number of interventions that were suggested for each patient was three (IQR = 2), while the median number of interventions that were accepted for each patient was one (IQR = 1). Out of 280 suggested interventions, 130 were accepted as a whole (46.43 percent) (Downing et al., 2018).

The use of medications without a prescription was found to be the most common Medication-Related Problem, accounting for 36% of all suggested interventions (102/280). This comprised: 15% of inhibitors of the proton pump; 14 percent (14/102); 11 percent (11/102); antiplatelet agents as well as 8% statins Sub-therapeutic dosing accounted for

23% of MRPs (65/280) and overdosing for 15% (41/280). The prevalence of various medication-related issues is depicted.

Three variables were found to be predictive of the number of medications taken by chronic hemodialysis patients in our study. They included: the number of concurrent conditions; if ischemic heart disease is present; likewise, respiratory problems. Payne findings are in line with these findings, which looked at how common polypharmacy was in primary care records in Scotland; The most common predictors of polypharmacy were the number of comorbidities and cardiovascular disease. Female gender was also not found to be an independent predictor of polypharmacy in dialysis patients, as was the case with our multiple linear regression models, with the exception of one observation with the largest Cook's distance. Lastly, cardiovascular diseases are known to be the leading cause of dialysis patients' morbidity and mortality, necessitating the use of a variety of medications, such as angiotensin-converting enzyme inhibitors, beta-blockers, statins, and antiplatelet medications. Consequently, this population's higher rate of polypharmacy is explained.

Our research has several limitations. First, rather than interviewing patients, the number of medications taken by each patient was determined by looking at electronic medication records. This could have resulted in inaccurate information regarding the actual number of medications taken by the patient, such as non-adherence or the use of over-the-counter medications. Additionally, a patient interview may have revealed additional opportunities for effective therapeutic interventions to reduce polypharmacy and reduce the prescribing of unnecessary medications. Second, the study was short, and there was no follow-up to see how the pharmacist's intervention affected polypharmacy or MRP reduction in the long run. Thirdly, because the resident pharmacist reviewed the medications at an early stage of the residency training program, we observed a low acceptance rate for the suggested interventions. This highlights the significance of pharmacists gaining clinical experience and communicating effectively in order to increase physicians' acceptance of interventions. Additionally, our physicians were reluctant to accept many of the interventions because they required referrals to other specialists to reevaluate the individual patient's requirements.

Our study has a number of strengths, including the fact that it is the first of its kind in our region to examine polypharmacy in dialysis patients and the most common predictors of the rising number of medications taken by hemodialysis patients. This gives healthcare providers insight into how to make the most of pharmaceutical care services for this particular population. Our study's findings also back up the importance of pharmacists regularly reviewing dialysis patients' medications to reduce polypharmacy, which is in line with previous research. Due to the lack of evidence regarding their efficacy or safety,

a recent study demonstrated that targeted deprescribing of medications can reduce polypharmacy in hemodialysis-needing outpatients (Yoseph et al., 2016)

To reduce polypharmacy and improve clinical outcomes in hemodialysis patients, future studies should examine the effects of medication therapy management services and the targeted deprescribing of medications at the transition of care during hospitalization.

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None

CONFLICT OF INTEREST

None

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