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The Impact of a Pharmacist-Led Deprescribing Program on the Medication-Related Burden among Iraqi Hemodialysis Patients

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Abstract

The Medication-related burden (MRB) is a relatively emerging concept in chronic disease management and healthcare. Hemodialysis (HD) patients have one of the most significant medication burdens of any patient population. This may be partially attributed to the high number of medications prescribed to manage chronic kidney disease (CKD) and comorbid conditions. In addition to this high volume of medications, the complexity of a medication regimen can be increased by additional instructions for medication use, increased frequency in dosing, and use of complex dosage formulations. One way to combat polypharmacy and inappropriate medication use is through medication deprescribing. This study aimed to assess the impact of implementing a pharmacist-led deprescribing program on the medication-related burden among HD patients. A prospective interventional one-group pretest-posttest-only design study was conducted at Wasit Center for Hemodialysis, Wasit Governorate, Iraq. Medication reconciliation followed by medication review based on the deprescribing program was done for all eligible patients, and the patients were monitored for three months for any possible complications. Two hundred and seventy patients were screened for eligibility, and only one hundred and eighteen patients were enrolled in the deprescribing program. The median age was 51.5 years (Interquartile range; IQR 39–62), 56.8% were males, and hypertension was the most common etiology for their CKD; 78% had comorbidities other than hypertension and CKD. After deprescription, there was a significant reduction in the number of medications from 6.0 (IQR 4.75–7.0) to 4.0 (IQR 3.0-5.0) ($p < .05$) and a reduction in the number of pills from 7.0 (6.0–9.0) to 5.0 (4.0–6.0) ($p < .05$). Medication-related burden assessed using the Arabic version of LMQ-3 also showed a significant reduction from 125.00 (IQR 111.75-138.0) to 114.0 (IQR 104.0-123.0) ($p < .05$). In conclusion, the deprescribing program has been shown to significantly reduce the burden of medication use by simplifying the medication regimen and getting rid of unnecessary medications. This leads to hemodialysis patients taking fewer number of medications and pills.

Keywords: chronic kidney disease, hemodialysis, deprescribing, medication-related burden, Iraq.

Introduction

The Medication-related burden (MRB) is a relatively emerging concept in chronic disease management and healthcare. It is defined as “the workload of healthcare and its effect on patient functioning and well-being.”[(1)] The concept has recently attracted the interest of researchers and healthcare professionals worldwide.

It has been demonstrated that treatment burden can contribute to non-adherence and poor clinical outcomes and impact patient satisfaction, psychological health, and functional status. The MRB can result in a decline in quality of life as patients devote more time, energy, and resources to staying healthy since they are burdened not only by their illness but also by their ever-growing healthcare regimens. [(2)]

Hemodialysis (HD) patients have one of the most significant medication burdens of any patient population. [(3)] This may be attributed to the concomitant comorbid conditions, including diabetes, hypertension, and cardiovascular diseases, in addition to the complications that are related to kidney failure itself, which require the use of multiple medications to manage these conditions. [(4)]Polypharmacy is a term that was first used to describe issues related to excessive drug use and multiple-drug intake. Since then, the term has taken on different meanings, such as "unnecessary use of drugs" and "medications used without an indication." However, using five or more medications is the most common definition in the literature. [(5)] Polypharmacy is more common as chronic kidney disease (CKD) advances.

Polypharmacy increases from 62% for individuals with stage I CKD to 86% among stage 3b CKD patients and 93% in HD. [6] This increases the risk ofunnecessary medication use, adverse effects, and drug interactions and reduces the health-related quality of life and adherence. [3]

One strategy to combat polypharmacy and inappropriate medication use is medication deprescribing. Deprescribing is a "planned and supervised process of dose reduction or stopping of medication(s) that may be causing harm or are no longer providing benefit" to reduce polypharmacy and improve outcomes while maintaining or enhancing quality of life. [7]

Various deprescribing tools have been developed to assist healthcare providers in decreasing inappropriate medications and polypharmacy among older individuals. [8] These tools have demonstrated significant positive outcomes, such as lower medication expenses, fewer transfers to long-term care facilities, lower mortality rates, and improved overall health perception. Importantly, these benefits were achieved without increasing the risk of long-term adverse consequences. However, it is worth noting that these tools were developed based on safety and efficacy data regarding elderly patients and may not apply to other patient groups, such as HD patients[9].

Although numerous recommendations exist regarding the deprescribing of medications among hemodialysis patients, research on this subject remains scarce[10].In Iraq, several studies have been conducted to assess adherence among HD patients [11,12], and medication burden was evaluated across various patient populations [13–15]. To the best of our knowledge, no studies that address deprescribing or its influence on MRB among dialysis patients have been reported in Iraq and Middle Eastern countries. Accordingly, the current study aimed to assess the impact of a proactive pharmacist-led deprescribing program on the MRB among hemodialysis Iraqi patients

Materials and Methods

This prospective interventional one-group pretest-posttest-only design study was conducted in Wasit Center for Hemodialysis, Wasit governorate, Iraq, from November 2022 to April 2023.

Study population

Patients who were at least 18 years old, had been on HD for at least three months, and had verbal consent to participate in the study were screened for eligibility. Inpatient HD patients admitted to the hospital during data collection, those unwilling to participate in the study, and those with hearing, speech, or cognitive impairments that would hinder their ability to comprehend the study questionnaires were excluded. (Figure. 1) shows the patients' recruitment flow chart.

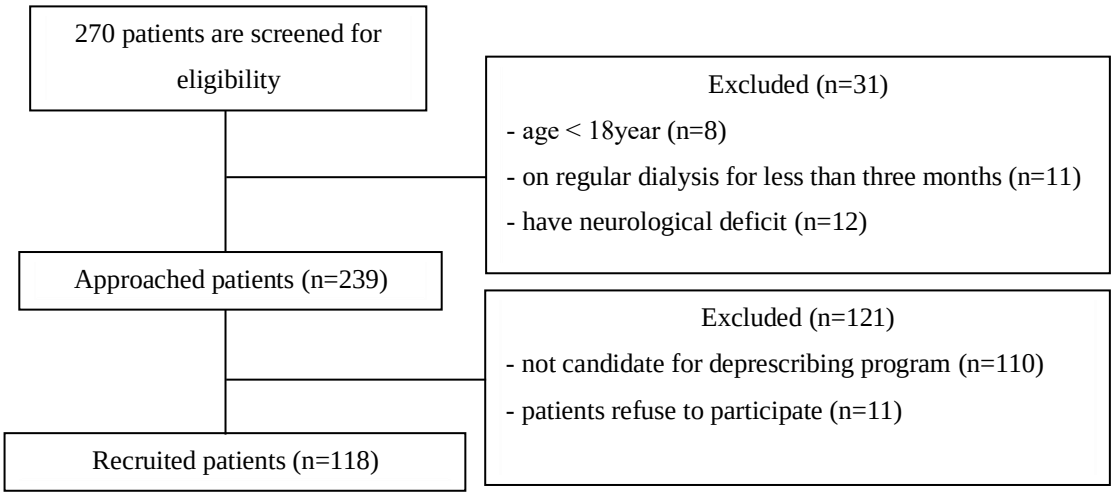

Figure 1. Patients' recruitment flow chart.

Data collection

To gather essential data for this study, the researcher designed a custom data collection form. For each patient who participated in the study, the following data was recorded:

1. Basic demographic traits: age and gender.
2. Data about disease and comorbidities: etiology of CKD, presence of chronic disease other than CKD, and hypertension.
3. Data about medications used by patients: number of medications, number of pills, name of medications, dose, frequency, and duration of use.
4. Additional details: presence of a caregiver, dialysis vintage, and schedule.

Assessing medication-related burden

Medication-related burden among HD patients was measured using the Living with Medicine Questionnaire-3 (LMQ-3) Arabic version. [16].

The original LMQ-3, developed in the UK to measure medication burden, has become widely utilized throughout many other nations as a survey tool. The questionnaire comprised 41 statements presented either positively or negatively and asked respondents to rate their agreement using a 5-point Likert scale. Negative questions are scored using inverse scoring; higher scores indicate a more significant burden or an unfavorable experience with medication use. Furthermore, this questionnaire includes an open-ended section where patients may provide further comments or elaborate on their responses. Additionally, a visual analog scale (VAS scale) allows respondents to give an overall assessment of their burden from zero ("no burden at all") up to 10 ("extreme burden at all"); higher scores indicate a more significant perceived burden. [17]

The LMQ-3 involves eight-domain scales to assess patients' feelings toward the burden of the medicines used. The domains include "Relationships/Communication with health care professionals about medicines, Practical difficulties, Cost-related burdens, Side effect burdens, Lack of effectiveness, Attitudes/Concerns about medicine use, Impact on/ Interference in day-to-day life, and Control/Autonomy to vary regimen." Burden categories based on VAS scores are no burden at all (0- 2.0), minimal burden (2.1-4.0), moderate (4.1-5.9), high burden (6.0-7.9), and extremely high burden (8.0-10.0). The total LMQ score is calculated by adding the scores for all 41 statements. Scores ranging from 41-205 correspond to the following: Extremely high burden (173-205), high burden (140-172), moderate burden (107-139), minimal burden (74-06), and no burden (41-73). [17]

The deprescribing program

The current program was developed based on comprehensive literature reviews and the latest recommendations for treating patients on HD. [18–31] The program comprised the following elements:

1. Patients should discontinue diuretics if their daily urine output drops below 200 ml. Patients were asked to monitor their urine output the day before the HD session.
2. Stop using prokinetics and proton pump inhibitors (PPIs) when there are currently no indications for their use.
3. When serum uric acid is less than 12mg/dl, and the patient has no history of nephrolithiasis and gout, the uric acid-lowering drugs should be stopped.
4. To treat iron deficiency anemia, stop taking oral iron supplements. Instead, intravenous Iron is used.
5. When serum bicarbonate is equal to or greater than 24 mEq/L, sodium bicarbonate should be discontinued.
6. To reduce the number of pills, use fixed-dose combinations instead of multi-pills when available.
7. To reduce dosage frequency, it is recommended to use extended-release formulations of drugs (when available).
8. Vitamin D preparations should be discontinued when parathyroid hormone is less than 150 pg/ml.
9. If corrected total serum calcium levels are higher than 9.5 mg/dl. Stop taking calcium supplements and calcium-based phosphate-binding agents.
10. If serum phosphate is below 5 mg/dl and PTH is between 150-600 pg/ml. Stop using phosphate binders.
11. Make sure that all prescribed medications are administered in the correct renal dosage adjustments.
12. Alpha-blockers must be stopped for patients with benign prostatic hyperplasia (BPH) if the patient is anuric.
13. Stop taking any medications or supplements that are contraindicated or have poor evidence.
14. The oral antidiabetic drugs (OADs) should be discontinued if the patient takes both OADs and insulin and has not achieved an acceptable glycemic level.

Deprescribing protocol

A list was made of all medications a patient was taking, including prescription drugs, over-the-counter drugs, herbal remedies, and supplements. It involved the following information: name, duration of use, dosage, and frequency. Then, the medication list was reviewed to determine the eligibility of each medication to be deprescribed (based on the deprescribing program). Issues identified during the medication review were communicated to the nephrologist to decide whether the medication had to be deprescribed or a specific action was needed. After obtaining the nephrologist's consent, the deprescribing plan is implemented accordingly. The patients were followed up for three months, during which the participants were monitored at weekly intervals by in-person interviews for any potential adverse effects and to ensure that a deprescribed medication was not re-started. (Figure. 2) summarizes the steps of the deprescribing process.

Study outcomes

The primary outcome was the MRB for the patients measured before and three months after the implementation of the deprescribing program. The average number of pills and medications per patient before and three months after implementing the program were the secondary outcomes.

Statistical analysis

The IBM SPSS Statistics 25 for Microsoft Windows software was used to perform the statistical analyses. Shapiro Wilk was used to assess the distribution of data. Continuous variables, which are non-normally distributed, are shown as medians (interquartile intervals), whereas categorical data is presented in percentages and frequencies. Wilcoxon's signed-rank tests were used to compare the differences in medians between pairs

of measurements taken before and after deprescription.

The statistical significance was determined by a P-value less than 0.05.

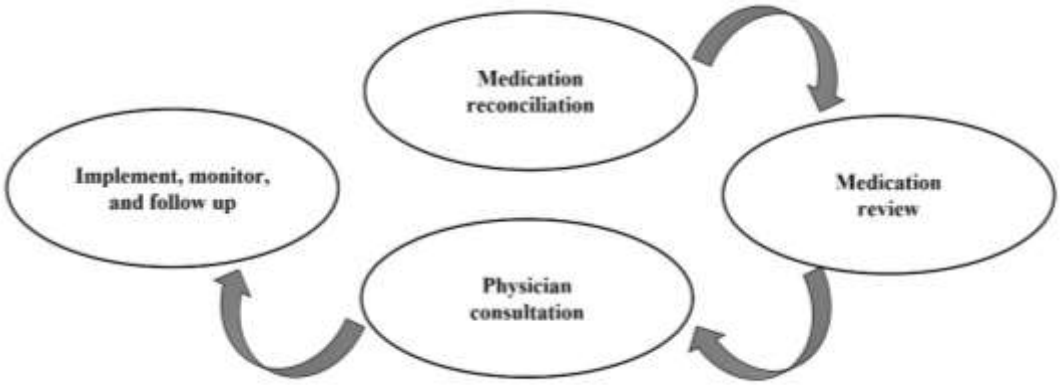

Figure 2. The steps of the deprescribing process.

Results

Baseline and sociodemographic characteristics

A total of one hundred and eighteen patients were enrolled in the current study. The median age of patients was 51.5 years (IQR 39-62). Male patients constituted (56.8%) of them. Hypertension was the most prevalent potential etiology for CKD (50%), followed by diabetic nephropathy (30.5%) and (19.5%) for others. The median number of medications and pills were 6 (4.75-7) and 7 (6-9), respectively, as shown in (Table. 1).

Table 1. Baseline and sociodemographic characteristics of participants

Characteristics	N=118
Age-years	
Median (IQR)	51.5 (39-62)
Gender-No (%)	
Male	67 (56.8)
Female	51 (43.2)
Etiology of CKD-No (%)	
Diabetic nephropathy (DN)	36 (30.5)
Hypertension (HT)	59 (50)
Others	23 (19.5)
Dialysis vintage-months	
Median (IQ)	24 (11-48)
Dialysis schedule-No (%)	
Twice weekly	52 (44.1)
Thrice weekly	66 (55.9)
comorbidities other than CKD and hypertension-No (%)	
Yes	92 (78)
No	26 (22)
Need for care giver-No (%)	
Yes	45 (38.1)
No	73 (61.9)
Number of medications	
Median (IQR)	6 (4.75-7)
≥ 5 medications-No (%)	89 (75.3)
Number of pills	
Median (IQR)	7 (6-9)
≥ 7 pills/day-No (%)	73 (61.8)

No: number; IQR: interquartile range

Description of medication-related burden among participants

The median (IQR) of the total LMQ score was 125 (111.75-138). The majority of enrolled patients experienced a moderate degree of burden (60.2%), followed by high burden (20.3%) and minimum burden (19.5%), with none of them experiencing no burden at all or extremely high degree of burden. (Table. 2).

Table 2. Degree of medication burden experienced by participants

Overall LMQ score median (IQ) 125 (111.75-138)	
Degree of burden	N (%)
No burden at all (41–73)	----------
Minimum burden (74 –106)	23 (19.5)
Moderate degree of burden (107–139)	71 (60.2)
High burden (140–172)	24 (20.3)
Extremely high burden (173–205)	----------

Outcomes after conducting the deprescribing program

Twenty- eight (23.72%) patients were initially taking diuretics, and their daily urine volume was less than 200 ml; diuretics were discontinued in twenty-one (75%) patients. Thirty-nine patients (33.05 %) were taking PPIs, and twenty-six patients (22%) were taking prokinetic drugs without specified indications. PPI has been deprescribed in twenty-four (61.53%) and prokinetic drugs in seventeen (65.38%) patients. Twenty-two patients (18.64%) were taking oral iron supplements, which were discontinued in all of them. Forty-one (34.7%) patients were taking (valsartan and amlodipine) as individual drugs; single-pill fixed-dose combination (FDC) replaced the multi-pills in thirty-six (87.8%) patients. Five (4.2%) patients were primarily on uric acid-reducing agents for treating asymptomatic hyperuricemia, and their serum uric acid was below 12 mg/dl. It was stopped in all of them. The extended-release form of drugs has been used instead of the immediate-release one in fourteen (11.9%) patients. Calcium and vitamin D supplements were discontinued in sixteen (13.55%) and nineteen (16.10%) patients, respectively. Calcium-based phosphate binders were stopped in nine (7.62%) and sevelamer in four (3.38%) patients. Nine (7.62%) anuric patients were on alpha-blockers for BPH; they were discontinued in all of them. Seventeen (14.40%) patients were taking over-the-counter supplements; they were stopped in thirteen (76.47%) patients. Dose reductions were made in twelve (10.16%) patients, and contraindicated drugs were stopped in three (2.54%) patients. Twenty-one (17.8%) patients were on OAD_s and insulin; OADs were discontinued in twelve (57.14%) patients.

A Wilcoxon signed-rank test was conducted to ascertain the effect of implementing the deprescribing program on the medication-related burden (LMQ score), number of medications, and total daily pills. One hundred and eighteen participants were recruited for the study. The desired outcomes are recorded before and three months after implementing the deprescribing program. There was a significant decline in the median of the measured outcomes before and after conducting the deprescribing program, as shown in (Table. 3).

Table 3. Outcome variables before and after conducting the deprescribing program

variables	**Pre**	**Post**	**P-value**
	Median (IQR)	Median (IQR)	
LMQ score	125.00 (111.75-138.00)	114.00 (104.00-123.00)	.000*
visual analog scale	7.00 (6.00-8.00)	4.00 (4.00-5.00)	.000*
Number of medications	6.00 (4.75-7.00)	4.00 (3.00-5.00)	.000*
Number of pills	7.00 (6.00-9.00)	5.00 (4.00-6.00)	.000*

*Significant (p-value< 0.05) according to Wilcoxon signed-rank test

Discussion

This study revealed that a significant proportion, exceeding three-quarters (80.5%) of the participants, encountered moderate to high levels of medication-related burden. This outcome emphasizes the substantial impact that medication management can have on individuals undergoing dialysis. Compared to a previous study conducted on dialysis patients using a different assessment tool for treatment-related burden [32], this study shows a higher level of burden experienced by the patients. Furthermore, the findings of this study were also higher than those reported by George et al. using the same assessment tool. [33]

The observed high MRB in this study can be attributed to the elevated prevalence of comorbidities among participants. Approximately 78% of patients had chronic medical conditions other than CKD and hypertension, necessitating the use of multiple medications to address these additional health concerns. This was evident in this study, as a substantial proportion of participants reported taking at least five medications (75.3%) and seven or more pills (61.8%) on a daily basis.

According to a study conducted in Iraq, about 26% of HD patients were infected with the hepatitis C virus. [34] Another study found that 66.7% and 18.3% of Iraqi HD patients have hypertension and ischemic heart disease, respectively. [35]

Polypharmacy may also be induced by the inappropriate prescribing of medications, ineffective monitoring to determine their efficacy and safety, and failure to make sure that patients' medication regimens are convenient and realistic. Based on the findings of a study conducted among Iraqi hemodialysis patients, it has been reported that 17.8% of patients were taking medications without clinical effects, and 9.6% were taking unnecessary medications. [36]

Various studies have demonstrated that CKD patients, especially those with end-stage kidney disease (ESKD) who undergo HD, encounter polypharmacy and an increased pill burden. These factors significantly contribute to the overall treatment burden and place patients at an increased risk for various complications, including drug-drug interactions, interactions between medications and existing medical conditions, adverse drug reactions, and challenges in adhering to prescribed treatments. [37,38]

Oral diuretics can be used on a chronic basis to augment urine output in patients with ESRD on either peritoneal or HD if they have adequate residual kidney function to maintain a clinically valuable diuresis (i.e., at least 250–500 ml/day). [39] Patients who are producing an adequate volume of urine (>250mL per day) may benefit from diuretics to reduce interdialytic weight gain, reduced volume overload, fewer episodes of intradialytic hemodynamic instability because of lower ultrafiltration requirements, relaxed diet, and improved quality of life. [19] In this study, diuretics were successfully discontinued in 75% of patients; in the others, their total daily urine output was closest to 200ml; the nephrologist decided not to stop diuretics as they can benefit the patients to some degree.

Just recently, it was believed that PPIs were safe. The emergence of evidence from multiple observational studies indicating an increased risk for severe adverse health outcomes and mortality challenged this perception. [40] Long-term use of PPIs in HD patients has been associated with lower serum magnesium levels, reduced density of bone, impaired calcium absorption, increased arterial calcification potential, and reduced efficacy of calcium phosphate binders. [24,41] In this study, out of thirty-nine patients taking PPI without specified indications, it was successfully deprescribed in twenty-four (61.53%) patients.

Patients on dialysis are often prescribed prokinetic agents, such as domperidone and metoclopramide, to manage symptoms of gastroparesis, such as nausea, vomiting, bloating, postprandial fullness, and early satiety. They are effective for the short-term treatment of gastroparesis; however, there is no evidence to support using these agents for managing chronic gastroparesis. [25] In this study, out of twenty-six (22%) patients who were taking prokinetic medications with no current indication, nineteen (73%) patients were on domperidone, and seven (26.9%) patients were on metoclopramide. They were deprescribed in seventeen (65.38%) patients, while the others were reinitiated them during the monitoring period.

In the general population, hyperuricemia is an independent predictor of cardiovascular disease and death from all causes. It has been associated with hypertension, coronary heart disease, and heart failure. [42] In contrast to the general population, HD patients are not at an increased mortality risk due to hyperuricemia. [27] Moreover, elevated uric acid levels were associated with improved nutritional status and a decreased risk of all-cause and cardiovascular mortality in this population. [43] In this study, five (4.2%) patients were taking uric acid-lowering medications for asymptomatic hyperuricemia; they were prescribed by other specialists during the pre-dialysis period and were continued when regular hemodialysis treatment was initiated. However, there are no current guidelines or recommendations to support the treatment of asymptomatic hyperuricemia. They were stopped in all of them.

Alpha-1 blockers are commonly used to treat BPH and high blood pressure. In BPH, alpha-1 blockers function by inhibiting alpha-1 receptors in the prostate and bladder, which relaxes smooth muscle, improves urinary outflow and reduces lower urinary tract symptoms. They do not influence the progression of BPH. [44] Anuric patients are no longer aware of these symptoms, making these medications unnecessary. [28] In this study, nine (7.6%) anuric patients were initially on alpha-blockers for BPH; they were stopped in all of them.

Hepcidin levels are commonly elevated among patients with CKD, most likely due to reduced renal clearance and increased systemic inflammatory mediators that induce hepcidin expression. In CKD, elevated hepcidin levels inhibit intestinal iron absorption and release from iron storage sites (macrophages, hepatocytes), hence reducing iron availability for erythropoiesis and contributing to anemia. [45] This explains the reduced efficacy of oral iron therapy in patients on HD. [46] There is strong evidence demonstrating that intravenous (IV) iron is more efficacious than oral iron in raising Hb, ferritin, and transferrin saturation levels in CKD patients on dialysis compared to those who are not. [47] In this study, twenty-two (18.64%) patients were taking oral iron supplements. The majority of these patients purchased them from pharmacies without a physician's prescription. They were deprescribed in all of them.

There is extensive evidence that medications taken once rather than multiple times daily for various conditions reduce MRB, the potential for missed doses and improve overall disease control. [48] In the current deprescribing program, FDC and extended-release formulations (when available) were recommended instead of multi-pills and immediate-release formulations. In this study, we switched thirty-six (30.5%) patients to the FDC and fourteen (11.9%) patients to the extended-release formulations.

Dietary and herbal supplements have extremely limited data regarding their safety and efficacy. In addition, their pharmacokinetics and interactions are rarely studied. This lack of information makes it extremely challenging to offer advice in such a complex population with polypharmacy, comorbidities, and altered pharmacokinetics. [20] Due to time constraints, information about these supplements is rarely discussed with physicians. Moreover, patients do not always declare this information. [49] In this study, seventeen patients (14.40%) were taking over-the-counter supplements, and the majority of these patients perceived these to be beneficial. However, there is no evidence for their safety or efficacy among HD populations, and they may be more dangerous than beneficial; after a nephrologist consultation, they were discontinued in thirteen (76.47%) patients.

Limited studies have evaluated the use of OADs among dialysis-dependent patients. Generally, it is recommended that when there is no rationale to combine oral hypoglycemic drugs with insulin therapy, the benefits must be weighed against the downsides of medication regimen complexity and cost. [50] Dipeptidyl peptidase- 4 (DPP-4) inhibitors add complexity and costs and are relatively weak. They may be discontinued when insulin is introduced. In addition, when starting insulin, sulfonylureas, meglitinides, and pioglitazone should be tapered off and discontinued due to the reduced efficacy compared to other combinations, as well as adverse effects. [21] Out of twenty-one (17.8%) patients using both OADs and insulin, OADs have been successfully deprescribed in twelve (57.14%) patients; the remaining patients have already attained an acceptable level of glucose control with these agents. The physician made insulin dose adjustments for the deprescribed cohort to achieve their glycemic targets.

Limitations

1- This study was only conducted in one center. Therefore, the results are unlikely to be generalized to other HD units.

2- The lack of a control group impedes our judgment to attribute observed improvements in the outcomes solely to the deprescribing program.

3- Reliance on patient's self-reporting of their medication usage. The reliability of reported medication use by patients could be affected due to recall bias.

Conclusions

Based on the study findings, the deprescribing program has been shown to significantly reduce the burden of medication use by simplifying the medication regimen and getting rid of unnecessary medications. This leads to HD patients taking fewer number of medications and pills.

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Conflicts of Interest

The author declares no potential conflicts of interest.

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Ethics Statements

The Scientific and Ethical Committee at the "College of Pharmacy, University of Baghdad" approved the study after the researcher submitted a proposal describing the study's objectives and methods in detail. In addition, Ministry of Health authorization was obtained. Patients' consent to participate in the study was verbally obtained.

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تأثير برنامج تقليل الأدوية بقيادة الصيدلي على العبء المرتبط بالأدوية بين مرضى غسيل الكلى العراقيين

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الخلاصة

يعد العبء المرتبط بالأدوية مفهوما ناشئاً نسبياً في قطاع الرعاية الصحية والامراض المزمنة. يعاني مرضى غسيل الكلى من أثقل أعباء الأدوية من بين جميع المرضى الاخرين. قد يُعزى ذلك جزئيًا إلى العدد الكبير من الأدوية الموصوفة لمعالجة الحالات المرضية المصاحبة؛ إضافة إلى هذا الحجم الكبير من الأدوية، يمكن أن يزداد تعقيد نظام الدواء بناءً على تعليمات الاستخدام، وتكرار الجرعات، وتركيبات الجرعات المعقدة التي

قد يكون استخدامها أصعب. تتمثل إحدى طرق مكافحة التعدد الدوائي واستخدام الأدوية غير المناسبة هو من خلال تقليل عدد الأدوية الموصوفة بشكل ممنهج وآمن. الهدف من هذه الدراسة هو تقييم تأثير تنفيذ برنامج تقليل الادوية بقيادة الصيدلاني على العبء الدوائي بين مرضى غسيل الكلى. تم إجراء دراسة تداخلية مستقبلية، أحادية المجموعة بالاختبار الاولي والمراجعة اللاحقة فقط في مركز غسيل الكلى، محافظة واسط، العراق. تم إنشاء قائمة دوائية دقيقة تحوي جميع الأدوية التي يتناولها المرضى وكيفية استخدامها متبوعة بمراجعة الأدوية بناءً على برنامج تقليل الادوية لجميع المرضى المؤهلين، وتم مراقبة المرضى لمدة ٣ أشهر بحثًا عن أي مضاعفات محتملة. تمت معاينة مئتان وسبعون مريضا لغرض ادخالهم في برنامج تقليل الادوية ولكن شروط الادخال توفرت في مائة وثمانية عشر مريضا فقط. كان متوسط العمر ٥١,٥ سنة (المدى الرباعي؛ ٣٩-٦٢)، كان ٥٦,٨٪ من الذكور، وكان ارتفاع ضغط الدم أكثر المسببات شيوعًا لمرض الكلى المزمن، وكان ٧٨٪ منهم يعانون من أمراض مصاحبة غير ارتفاع ضغط الدم ومرض الكلى المزمن. بعد تنفيذ البرنامج، كان هناك انخفاض معنوي في عدد الأدوية من ٦,٠ (المدى الرباعي ٤,٧٥-٧,٠) إلى ٤,٠ (المدى الرباعي ٣,٠-٥,٠) وانخفاض في عدد الجرع اليومي من ٧,٠ (٦,٠-٩,٠) إلى ٥,٠ (٤,٠-٦,٠). أظهر العبء المرتبط بالدواء الذي تم تقييمه باستخدام النسخة العربية من استبيان التعايش مع الادوية-النسخة الثالثة أيضًا انخفاضًا كبيرًا من ١٢٥ (المدى الرباعي ١١١,٧٥-١٣٨,٠) الى ١١٤,٠(المدى الرباعي ١٠٤,٠-١٢٣,٠). برنامج التقليل من الأدوية بإشراف الصيدلي هو استراتيجية ناجحة في تقليل عدد الأدوية والحبوب اليومية الموصوفة، بينما تحسن في الوقت نفسه العبء المتعلق بالأدوية بين مرضى الغسيل الدموي.

الكلمات المفتاحية: امراض الكلى المزمنة، غسيل الكلى الدموي، تقليل الادوية، العبء المرتبط بالأدوية، واسط، العراق