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Research Article

### ANALYSIS OF PHARMACEUTICAL CARE ON CLINICAL OUTCOMES AMONG HEMODIALYSIS PATIENTS

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**Introduction:** Pharmaceutical care provided by clinical pharmacists is defined as “the responsible provision of drug therapy for the purpose of achieving definite outcomes that improve a patient’s quality of life”. It has been proven to be useful and helpful in improving the medication quality for both ambulatory and hospitalized patients with various diseases such as hypertension, asthma, dyslipidemia, heart failure, and tuberculosis. **Objectives of the study:** The basic aim of the study is to find the pharmaceutical care on clinical outcomes among hemodialysis patients. **Material and methods:** This study was conducted at Mayo hospital, Lahore during 2018. This study was a randomized, controlled, prospective trial with 6-month follow-up. The PC accentuates the motivation and patient education regarding the knowledge about the drugs, disease, lifestyle modifications, nutritional information, personal interview, and medication review. **Results:** A total number of 100 patients were recruited during the study. The baseline outcomes such as IDW, Hb levels, BP and medication adherence rate scores have not been significantly differ. The changes in the outcomes of IDW, Hb levels, BP, and medication adherence rate scores at different time intervals are given in the tables of the academic hospital, government hospital and corporate hospital data respectively in table 02. **Conclusion:** It is concluded that extra pharmaceutical care provided by pharmacist to HD patients can improve the overall clinical outcomes, such as the levels of FBG, HbA1c, TC, the target attainment rates of HbA1c and BP, and also medication adherences, which contribute greatly to therapeutic effect.

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**INTRODUCTION:**

Pharmaceutical care provided by clinical pharmacists is defined as “the responsible provision of drug therapy for the purpose of achieving definite outcomes that improve a patient’s quality of life”. It has been proven to be useful and helpful in improving the medication quality for both ambulatory and hospitalized patients with various diseases such as hypertension, asthma, dyslipidemia, heart failure, and tuberculosis. Clinical pharmacists have been playing an important role in the People’s Republic of China in recent years, providing pharmaceutical care for an expanding population of patients with cardiovascular diseases, cancer, respiratory diseases, and so on. Although some studies reported pharmaceutical care in endocrinal diseases, a major limitation is that few research were conducted on outpatients [1].

Most of the publications have revealed that there is a lack of knowledge, attitude, and practice (KAP) regarding the drugs, disease, and lifestyle changes among chronic kidney disease (CKD) patients on hemodialysis (HD). The poor adherence is a common problem where patient’s myths and beliefs play an important role in shaping the KAP [2]. The comprehension and the practice should go hand in hand to achieve good clinical outcomes in HD patients. In the field of healthcare, gaps in the knowledge are rampant and have their impact on patient’s KAP, which are usually unnoticed irrespective of their socioeconomic status. There is an utmost need for all the patients to get information in the area of drugs, disease, lifestyle and nutritional changes. Kidney failure shoves the patients into a stiff condition wherein massive adjustments for serum potassium, calcium, sodium, phosphate, albumin, and hemoglobin (Hb) levels turn out to be serious. Although HD supplements some of the renal functions it cannot be a substitute for the kidney itself. HD is a cumbersome and perilous process requiring the patients and attendants to be on highly attentive [3]. The even slight disparity in lifestyle, diet, and ignorance about the disease can lead to relentless outcomes leading to admissions to intensive care unit or death. The pharmaceutical care provision has been benefited in HD patients in the

field of quality of life, clinical, economic out-comes [4].

**Objectives of the study**

The basic aim of the study is to find the pharmaceutical care on clinical outcomes among hemodialysis patients.

**MATERIAL AND METHODS:**

This study was conducted at Mayo hospital, Lahore during 2018. This study was a randomized, controlled, prospective trial with 6-month follow-up. The PC accentuates the motivation and patient education regarding the knowledge about the drugs, disease, lifestyle modifications (restriction of fluid, daily salt intake limit, thirst management, foodstuffs-containing potassium, phosphate, protein, and sodium), nutritional information, personal interview, and medication review. The PC group has also provided with a validated pictogram-based information leaflets and advice on medication administration, laboratory monitoring and adherence to HD and medication related issues. The assessment of outcomes includes Hb levels; IDW, BP, and medication adherence have been carried out at baseline, 6<sup>th</sup> and 12<sup>th</sup> months by follow-up.

**Analysis**

Student’s t-test was performed to evaluate the differences in roughness between groups. Two-way ANOVA was performed to study the contributions. A chi-square test was used to examine the difference in the distribution of the fracture modes (SPSS 19.0 for Windows, SPSS Inc., USA).

**RESULTS:**

A total number of 100 patients were recruited during the study. The baseline outcomes such as IDW, Hb levels, BP and medication adherence rate scores have not been significantly differ. The detailed baseline outcomes of the HD patients are presented in table 01. The changes in the outcomes of IDW, Hb levels, BP, and medication adherence rate scores at different time intervals are given in the tables of the academic hospital, government hospital and corporate hospital data respectively in table 02.

**Table 01:** Demographic characteristics of patients

Demographics	Levels	IG (n=100)	CG (n=99)	P-value
Mean age (year)		58.86±10.59	59.20±10.34	0.818
Male, n (%)		51 (51.0%)	47 (47.5%)	0.619
Level of education	None	4 (4.0%)	5 (5.2%)	0.929
	Primary	2 (2.0%)	3 (3.1%)	
	Secondary	63 (63.0%)	58 (58.5%)	
	Bachelor and above	31 (31.0%)	30 (31.3%)	
Working status	No	62 (62.0%)	56 (56.5%)	0.435
	Yes	38 (38.0%)	43 (43.4%)	
Medical expense	Medical insurance	81 (81.0%)	59 (59.6%)	0.003
	Public insurance	12 (12.0%)	21 (21.2%)	
	Private expense	7 (7.0%)	19 (19.2%)	
BMI (kg/m <sup>2</sup> )		24.87±3.34	24.32±3.14	0.235
Duration of diabetes (year)		7.86±6.61	8.22±6.10	0.690
Family history of diabetes	Yes	46 (46.0%)	53 (53.5%)	0.288
	No	54 (54.0%)	46 (46.5%)	
Complications	Yes	35 (35.0%)	27 (27.3%)	0.239
	No	65 (65.0%)	72 (72.7%)	
Smoking	Yes	35 (35.0%)	33 (33.3%)	0.804
	No	65 (65.0%)	66 (66.7%)	
Alcohol drinking	Yes	21 (21.0%)	26 (26.3%)	0.382
	No	79 (79.0%)	73 (73.7%)	
Exercise	Yes	70 (70.0%)	77 (77.8%)	0.212
	No	30 (30.0%)	22 (22.2%)	
Number of prescribed medications		4.23±2.13	3.81±2.07	0.155

**Note:** Data presented as n (%) or mean ± standard deviation.

**Abbreviations:** BMI, body mass index; CG, control group; IG, intervention group; SD, standard deviation.

**Table 02:** Clinical outcomes of HD patients

Outcomes	Baseline <sup>#</sup>		6 Months <sup>#</sup>		12 Months <sup>#</sup>		Greenhouse-Geisser and <i>P</i>
	UC group (n=41)	PC group (n=42)	UC group (n=41)	PC group (n=42)	UC group (n=41)	PC group (n=42)	
IDW (L)	4.03±0.70	4.20±0.72	4.19±0.65	3.60±0.78	4.04±0.78	3.53±0.49	F (1.523, 123.397)=39.089, <i>P</i> <0.001***
SBP (mm Hg)	162.83±15.13	164.52±19.15	162.54±12.08	158±10.93	160.24±7.08	155.67±7.64	F (1.395, 113.016)=4.902, <i>P</i> = 0.018*
DBP (mm Hg)	93.56±6.90	92.61±6.16	92.34±5.03	88.76±5.49	91.85±5.75	86.95±4.78	F (1.734, 140.456)=6.312, <i>P</i> = 0.004**
Hemoglobin (g/dL)	8.78±1.24	9.21±1.29	8.39±1.31	9.49±1.48	9.02±1.50	9.80±1.48	F (1.916, 155.192)=3.295, <i>P</i> = 0.042*
Medication adherence rate	4.29±1.27	4.67±1.38	4.51±1.36	6.05±1.01	4.53±1.16	6.12±1.40	F (1.738, 140.783)=20.542, <i>P</i> <0.001***

UC: Usual care, PC: Pharmaceutical care, HD: Hemodialysis, IDW: Interdialytic weight gain, SBP Systolic blood pressure, DBP: Diastolic blood pressure, \**P* is significant at the 0.05 level, \*\**P* is significant at the 0.01 level, \*\*\**P* is significant at the 0.001 level, #Mean ± SD, SD: Standard deviation.

## DISCUSSION:

Poor adherence, including medication adherence and lifestyle adjustment adherence, can greatly influence the treatment outcomes. In a number of reasons that may affect adherence, the most common but overlooked issue is the extent to which patients may understand the medical plan [4]. Ciechanowski et al

found that better communication between patients and clinicians contributed to a better compliance and more desirable glycemic control.

The pharmaceutical care is a comprehensive patient education system serving in the areas of drug, disease, nutritional, and lifestyle information with an

objective to empower the patient with self-management of his or her condition [5]. The clinical outcomes are considered as important in deciding the therapy by care providers. The clinical outcomes are measurable and quantitative. The clinical outcomes are heavily relied on deciding the outcomes previously due to advancement in tools [6].

It is also observed that the significant increase in Hb levels was seen in PCG compared to UCG with a statistical significance of  $P < 0.05$  in the academic hospital, government hospital and cumulative data of HD patients<sup>7</sup>. This rise in Hb levels is due to the medication adherence and close monitoring of anemia. The “Kidney Disease: Improving Global Outcomes” disseminated guidelines for the use of erythropoietin stimulating agents (ESA) in patients with dialysis, advising them to know that the ESA can increase the risk for heart attack, heart failure, stroke, blood clots, and death when given to maintain higher Hb levels<sup>8-9</sup>. The similar clinical pharmacist initiated an “anemia educational program” among the CKD had a positive effect on patients’ “energy, daily activities, and general well-being [10,11].

#### CONCLUSION:

It is concluded that extra pharmaceutical care provided by pharmacist to HD patients can improve the overall clinical outcomes, such as the levels of FBG, HbA1c, TC, the target attainment rates of HbA1c and BP, and also medication adherences, which contribute greatly to therapeutic effect.

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