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Correlation between medication adherence and quality of life in Haemodialysis undergoing patients in a Tertiary Care Hospital in South India

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ABSTRACT

Chronic kidney disease (CKD) in Endstage renal disease (ESRD) state face complex medication routines, increasing risk of non-compliance and drug-related problems. This work aimed to correlate between medication adherence and quality of life in haemodialysis undergoing patients. A prospective, observational, comparative single centre study was conducted in hemodialysis department of a tertiary care teaching hospital. Pre-post data of medication adherence of hemodialysis patients was evaluated by specially designed and validated questionnaire and quality of life was evaluated by KDQOLSF 36. Karl-pearson correlation coefficient was used to find correlation between medication adherence and quality of life. There were 74 patients in study group with mean age 58.95±10.09 years and there was a male preponderance of 50(67.6%) patients. About 60(81.1%) patients were undergoing dialysis twice a week. There was remarkable improvements in scores comapered to baseline (mean ± SD) of medication adherence (5.6±2.11 to 8.8±1.41), overall quality of life (1321.4±394.06 to 2467.4±268.72). Pearson correlation coefficient shown a significant positive correlation between medication adherence and quality of life (0.230). There were improvements in both medication adherence as well as overall quality of life in post test and this improvement might be due to the additional care given by the clinical pharmacists as it was the only additional medicine related care given to the study sample during the study period. Due to heavy patient load doctors may not get enough time to explain in detail about each drugs and importance of adherence to treatment to manage concomitant diseases and complications of chronic kidney disease this gap can be filled by clinical pharmacists.

INTRODUCTION

Chronic kidney disease (CKD) represents a growing health concern in India [1]. Managing CKD necessitates lifelong treatment and lifestyle adjustments, which can pose challenges to adherence and quality of life [2]. Hemodialysis emerges as a safe and efficient method for managing CKD patients as they progress to end-stage renal disease (ESRD) [3].

Non-adherence to hemodialysis can result in high morbidity, mortality, costs, and strain on the healthcare system [2]. The primary objective of treatment is to halt or slow down kidney dysfunction by addressing its underlying causes [4]. CKD patients typically have to consume 8-10 medications daily, with many requiring multiple doses, contributing to the risks associated with polypharmacy and the medically unstable nature of the disease [2,5]. Due to these factors and the constrained lifestyle imposed by dialysis, patients face an elevated risk of non-adherence and drug-related issues [5]. Consequently, education and counselling programs become imperative in the ESRD population to enhance their quality of life and improve medication adherence [6,7].

This study aimed to correlate between medication adherence

and quality of life in haemodialysis undergoing patients.

Need for the study

End stage renal disease patients are on polypharmacy and adherence to the medications is very important to improve their quality of life. This study could be used to correlate medication adherence and quality of life and to assess the effect of additional care given by clinical pharmacists in medication adherence and quality of life of these patients. No such studies have been conducted in the study site

MATERIALS AND METHODS

Study design

A prospective, observational, comparative single centre study was conducted in the Nephrology department of a tertiary care hospital for a period of six months which included pre and post analysis on medication adherence and quality of life. Baseline Medication adherence of the patients was evaluated by specially designed and validated questionnaire and quality of life was evaluated by KDQOL SF 36. Patients were given additional information related to medications with the help of specially designed patient information leaflet. Follow up was done after three months by different researchers to assess medication adherence and quality of life.

Study population

This study included CKD patients of either gender aged above 18 years who were undergoing hemodialysis at least twice weekly.

SAMPLE SIZE

The sample size was calculated by the formula, $n=(z^2\times pq) \div m^2$

Where,

z - statistic corresponding to the level of confidence 1.96

P - expected prevalence = 19.71

q- 100-p

m- allowable error=10%

The minimum sample size required was found to be 61.

We excluded haemodialysis undergoing patients with psychiatric illness, patients with multiple organ failure, malignancies, memory impairment, unconscious, severely disabled and patients with reported hearing problem and blindness.

Methodology

Details of patients undergoing hemodialysis atleast twice weekly were collected in a specially designed patient data collection form from the medical records and the Mediware system available in the Hospital. The patients who met the inclusion and exclusion criteria were selected and their medication adherence was evaluated by specially designed and validated questionnaire. The questionnaire was validated by 10 competent professionals. Quality of life was evaluated by KDQOL-SFTM (Kidney Disease And Quality Of Life TM Short Form Version 1.3) after getting permission. Additional information related to medications were provided with the help of specially designed patient information leaflet. Patients were followed up after 3months to assess medication adherence and quality of life. The pre-test data and post-test data were collected by different researchers in order to avoid bias. The pre-post data were analysed using SPSS statistical software.

Statistical analysis

The collected data were compiled using Microsoft Excel and were presented using tables. The data were tabulated, analysed and compared with relevant studies. Analyses were carried out at 5% level of statistical significance. Calculation of mean, standard deviation, paired t-test were carried out using statistical calculators and Karl-pearsons correlation coefficient utilized for analyzing the corelation between the two variables. The statistical software SPSS was used for analysis of the data.

RESULTS

Demographic details of patients enrolled in the study

A total of 74 patients met the inclusion criteria and were recruited for the study. The mean age of the study population was 58.95±10.09 years, with male patients dominating with 67.6%.

Table 1 : Sociodemographic characteristics of study population

Variables	No of patients (%)	Variables	No of patients (%)
Age distribution		**Gender distribution**	
20-30	2(2.7)	Male	50(67.6)
31-40	0(0)	Female	24(32.4)
41-50	10(13.5)		
51-60	29(39.2)	**Frequency of dialysis**	
61-70	23(31.1)	Twice weekly	60(81.1)
71-80	9(12.2)	Thrice weekly	14(18.9)
81-90	1(1.4)		

Table 2 : Comparison of pre-test and post-test of medication adherence and quality of life.

	High adherence	Medium adherence	Low adherence	Good QOL	Average QOL	Poor QOL
Pre-test	39.2%	48.6%	12.2%	0.0%	41.9%	58.1%
Post-test	91.9%	8.1%	0.0%	43.2%	56.8%	0.0%

Table 3 : Effect of patient education in medication adherence and quality of life

Adherence and QOL scores	Pre-test (Mean ± SD)	Post test (Mean± SD)	P Value
Medication adherence	5.6±2.11	8.8±1.41	
Overall quality of life	1321.4±394.06	2467.4±268.72	
PCS	205.7±128.91	448.6±108.61	*<0.01*
MCS	273.1±136.81	546.1±125.16	
KDCS	842.6±232.64	1472.6±123.94	

About 81.1% of patients were undergoing dialysis twice a week. (Table 1)

Assessment of medication adherence and quality of life of haemodialysis patients

Out of 74 patients undergoing haemodialysis the pre-post data of medication adherence and quality of life was assessed and compared. During pre-test there were only 39.2% patients showing high adherence to medications which was increased to 91.9% while there were no patients showing good quality of life but in post test there were 43.2% of patients. There were 48.6% of patients with the medium adherence level during pre-test but the percentage was decreased to 8.1% during post-test and 41.9% patients showing average quality of life during pre-test was increased to 56.8% during post-test. Though there were 12.2% patients with poor medication adherence in the pre-test, there were no patients in the study group with poor adherence in the post test. In case of overall quality of life there was 58.1% patients with poor quality of life in the pre-test, but there were no patients in the study group with poor quality of life in the post test. The difference was significant statistically with *p value <0.01.(Table 2)*

Effect of patient education in medication adherence and quality of life

Our study revealed remarkable difference in the scores (mean ± SD) of medication adherence, overall quality of life and in all 3 domains of KDQOL. The scores after patient education were improved and the difference was statistically significant in paired-t test. $p < 0.01$, There was a significant difference existing between the pre-test and post-test medication adherence, overall quality of life and 3 components of KDQOL among hemodialysis patients. This proves that there is a significant effect of patient education in improving medication adherence and quality of life in hemodialysis patients.

Among the three dimensions of QOL, i.e., physical component summary, mental component summary and kidney disease component summary, the respondents had higher score for kidney disease component summary compared to that of mental component summary and Physical Component summary. (Table 3)

Correlation of medication adherence with quality of life

Pearson correlation coefficient shown a significant positive correlation between medication adherence and quality of life ie, as medication adherence increases, quality of life is also increasing. All the three domains of QOL also shown positive correlation with the adherence pattern. (Table 4)

Table 4 : Correlation between Medication adherence, overall Quality of life and its components

Variables	Pearson Correlation
Adherence & Quality of life	0. 230
Adherence & PCS	0.108
Adherence & MCS	0.243
Adherence & KDCS	0.187

DISCUSSION

The overall treatment adherence and QOL of ESRD patients are significantly impacted by patient education provided by the clinical pharmacist. The main therapeutic outcome for CKD patients is increasing patient compliance and thereby QOL of the patients. Effective management can only be attained when the patients have adherenence to their medication. Altered physical and emotional status of patients, reduced recalling of medication information, drop in the medication knowledge, lack of continuous education by members of healthcare team and frequent modifications of dosage and timing of medications especially antihypertensives and phosphate binders based on the blood pressure and serum phosphate level of the patients, respectively, and lack of interest or lack of active participation in the education program by patients might have been the reason for the patients reduced adherence to medications and QOL.

Clinical pharmacist activities improved the patient's overall drug/disease knowledge, adherence to drug dosage regimen. This improvements in both medication adherence as well as overall quality of life may be due to the additional care given by the clinical pharmacists as it was the only additional medicine related care given to the study sample during this study period.

In a study conducted by Varghese et al on "Medication adherence and quality of life in patients with Chronic kidney disease" in a South Indian institution the authors reported that the patients with low and medium adherence during the baseline were gradually reduced and patients with high adherence during baseline visit were later improved in the follow up [8].

A study by Naalweh K S on "Treatment adherence and perception in patients on maintenance hemodialysis: a cross sectional study" from Palestine shown that perception of importance of adherence was significantly correlated with reported adherence suggesting that counselling of patients on HD regarding their treatment modalities is important to improve therapeutic outcome [9].

Non adherence to the medications will adversely affect the quality of life of the patients. It is also evident that quality of life of Hemodialysis patients is highly impaired. The pharmaceutical care provided by the health care providers from variety of disciplines improves quality of life and can secure better compliance.

In our study, It was found that after patient counselling there was significant improvement in Quality of Life of the patients with CKD. The highest average score was for the Kidney disease component summary and lowest average score was for physical component summary. Results of the study conducted South India by Maria James et al is supporting the present study results where a significant improvement in adherence in every domains QOL after educational intervention and counselling [2].

A study conducted by Dixon Thomas et al on the topic Effect of patient counselling on quality of life of hemodialysis patients in India shown the impact of patient counselling as promising in improving health related QOL in ESRD. Some patients knew very little and some knew nothing at all except for the colour of the medication they were taking. Awareness of patients on diet and medication through patient counselling was found to be very effective in improving QOL in HD patients [10].

In our study a significant *($p<0.05$)* positive correlation was seen between the medication adherence and the quality of life of the patients in our study site. The study impact of education on knowledge, adherence and quality of life among patients on Hemodialysis by Victoria Alikari et al suggest the same where a significant positive correlation was found between the change in the overall QOL and the changes in the total adherence score [11].

Likewise a study conducted in Tehran, by Mahin Naderifar et al Correlation between quality of life and adherence to treatment in hemodialysis patients revealed that a significant correlation between total score of quality of life and adherence to treatment indicating that adherence to treatment affects quality of life significantly [12].

There are some limitations in our study

As our study was conducted in a single setting and the sample size was quite small, it was challenging to explorate the results across the whole country. Our study period was for a duration of 6 months, and if the study duration was for a longer period more reliable data could be obtained. Even though different researchers provided education to the study population there might be a possibility for bias in terms of the time spent by them for each patient.

CONCLUSION

There were improvements in both medication adherence as well as overall quality of life in post test and this improvement might be due to the additional care given by the clinical pharmacists as it was the only additional medicine related care given to the study sample during the study period. Due to heavy patient load doctors may not get enough time to explain in detail about each drug and importance of adherence to treatment to manage concomitant diseases and complications of chronic kidney disease. This gap can be filled by the clinical pharmacists as there is improvement in medication adherence and in each domain of quality of life of patients due to the additional education imparted by the clinical pharmacists.

Ethical consideration

The Institutional Ethics Committee approved the study protocol entitled "Impact of patient education by clinical pharmacist on medication adherence and quality of life in hemodialysis patients" in a tertiary care hospital during the period (December 2022 to April 2023) vide letter no. LH/EC/202230.dated 1 December 2022.

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Conflicts of interest

There are no conflicts of interest.

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