Evaluation of pharmacist counseling in improving knowledge, attitude, and practice in chronic kidney disease patients

Anurodh Ghimirey[1], Binaya Sapkota[1], Sweta Shrestha[1], Nabin Basnet[2], P Ravi Shankar[3], and Sujata Sapkota[4]

Abstract

Background: Chronic kidney disease is a public health problem with an increasing incidence and prevalence, poor outcomes, and high cost. Patient involvement forms the keystone in the management of chronic kidney disease. This study evaluated effects of pharmacist-provided counseling in dialysis patients in terms of their knowledge, attitude, and practice outcomes.

Methods: A total of 64 patients with chronic kidney disease were enrolled into the prospective, pre–post study based on the inclusion and exclusion criteria. The knowledge, attitude, and practice of patients regarding chronic kidney disease were assessed and recorded via baseline questionnaire. Case group patients were counseled regarding chronic kidney disease, their medication, diet, and lifestyle, and they were also provided with informative leaflet, whereas in the control group patients, the pharmacist did not intervene. After 1-month intervention, knowledge, attitude, and practice scores of patients of both groups were measured using the same knowledge, attitude, and practice questionnaire. Effectiveness of counseling on case group patients was evaluated by comparing the mean knowledge, attitude, and practice scores before and after counseling by paired t-test.

Results: Mean knowledge, attitude, and practice scores before intervention were 8.16 ± 4.378, 38.19 ± 3.217, and 6.69 ± 0.896, respectively, and these scores were changed to 13.75 ± 3.510, 38.78 ± 3.035, and 6.91 ± 0.777, respectively, after the intervention ($p < 0.05$).

Conclusions: The pharmacist-provided counseling is effective in improving knowledge, attitude, and practice of patients toward the disease management.

Introduction

The number of patients being treated for chronic kidney disease (CKD) stage V or end-stage renal disease (ESRD) globally was estimated to be 2,786,000 (out of which approximately 2,164,000 were undergoing dialysis treatment) at the end of 2011, and it is continuously increasing at a rate of 6%–7%.[1] In Nepal also, approximately 2.6 million Nepalese suffer from kidney disease.[2] CKD is a progressive disease and is defined as the reduction of kidney function (an estimated glomerular filtration rate (eGFR) < 60 mL/min/1.73 m^2) and/or the evidence of kidney damage, including persistent albuminuria (>30 mg of urine albumin/g of urine creatinine). With the increasing incidence of ESRD and health-care expenditures necessary to manage the ESRD population, improving the outcomes and quality of care of patients with ESRD is the topmost priority. Generally, ESRD patients have other concurrent diseases that require intensive

patient care and multiple medications, and these diseases are costly to the health-care system. Consequently, control of the disease progression becomes difficult and requires a multiprofessional team to provide the patient with the best care in which the pharmacist can play a key role.

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[1]Kathmandu University, School of Science, Department of Pharmacy, Dhulikhel, Kavre, Nepal
[2]Kist Medical College, Department of Nephrology, Imadol, Lalitpur, Nepal
[3]Xavier University School of Medicine, Department of Pharmacology, Oranjestad, Aruba, Dutch Caribbean
[4]University of Sydney, Sydney, NSW, Australia

Corresponding author:
Anurodh Ghimirey, Kathmandu University, School of Science, Department of Pharmacy, Dhulikhel, Kavre, Nepal.
Email: annrodh@hotmail.com

Pharmacological and non-pharmacological benefits can be achieved through better understanding of CKD and medications, and lifestyle modification such as weight reduction, exercise, and dietary manipulations can be effective via counseling. Understanding the levels of knowledge, attitude, and practice (KAP) of respondents about CKD will enable a more efficient process of awareness creation in the community. Belagodu et al.[3] reported that trained clinical pharmacists could play a vital role in educating hemodialysis patients, which has obvious benefits on therapeutic outcome. They reported that the medication knowledge of hemodialysis patients was poor, and it emphasized the need for the continued education to these individuals.[3] In Nepal, due to poor literacy rates and weak economic condition, there are inadequate resources for patients to obtain information and awareness about CKD, medicine, and the preventive methods. Counseling and information leaflet provided to CKD patients about their disease, medications, diet, and lifestyle modifications in this study may help cover these aspects. A prospective intervention study conducted in 2009 in India revealed that patient counseling focusing on dialysis compliance, diet, and medications was an effective way to improve health-related quality of life (QoL) and awareness in ESRD.[4] Another study using a self-administered questionnaire conducted in 676 patients with stage III–V CKD showed that about one-third of the patients had limited or no understanding of their disease and no awareness regarding their treatment options, which reflects problems with patient education.[5]

A study conducted in 41 ESRD patients in Japan showed that active participation of pharmacists in the management of anemia in hemodialysis patients with ESRD had great therapeutic and pharmacoeconomic impact.[6] In India, a prospective study concluded that the high level of acceptance of clinical pharmacist's recommendations by the nephrologists demonstrated that clinical pharmacists may help improve overall patient care.[7] This research has been carried to study the actual KAP regarding CKD among dialysis patients and to provide counseling by a clinical pharmacist in helping the patients learn to reduce complications and improve QoL. Demand for hemodialysis services is greatly increasing, but there are not enough treatment facilities and treatment is very expensive. In Nepal, many patients cannot afford transplantation, and dialysis has given them the hope to live longer.[8]

Methods

Study site, study design, study population, and study duration

The prospective, pre–post study was conducted in hemodialysis unit of KIST Medical College and Teaching Hospital (KMCTH), Lalitpur, Nepal from April to September 2012. There are eight dialysis machines in the hemodialysis unit which provides service to 32 patients everyday and runs in four shifts (morning, day, evening, and night). A total of 64 patients were enrolled in the study, 32 patients as controls and 32 as test based on inclusion and exclusion criteria.

Ethical considerations

The study was conducted after the approval of Department of Pharmacy, Kathmandu University (KU), and Institutional Review Board (IRB), KMCTH. Written informed consent was taken from the patients of both groups before participation in the study. At the end of the study, all the control group patients were also provided with leaflets and counseling.

Inclusion criteria

Dialysis patients aged 18–75 years who were ready to give informed consent to collect data for the study were included for the study.

Exclusion criteria

Patients below 18 and above 75 years of age and mentally retarded patients were excluded from the research.

Research tools, data collection, and data analysis

First, the questionnaire was prepared in English and was translated to Nepali language and back-translated to English language by a different person, and the retranslated version was compared with the original. All patients enrolled in the study were provided with the questionnaire in Nepali language, and they were requested to read and answer the questionnaire themselves. For the knowledge questions, each question was scored as 1 for a correct answer and 0 for an incorrect answer. Attitude questions were scored on a 5-point Likert scale, and the patient's level of agreement toward the given statement was checked. Each question was scored as 5 for the greatest level of agreement (strongly agree), 0 for the lowest level of agreement (strongly disagree), and others in between 1 and 5. For the practice questions, adherence to the disease management guidelines was merited a score of 1, whereas nonadherence was given a 0 score. The questionnaire was validated by pretesting in 10% of total respondents, that is, seven, and the pretested data were not included in the data analysis. All data were collected by the principal researcher himself. The pharmacists (three pharmacists and one supervising pharmacist) involved in increasing the KAP of CKD patients were PharmD (Post-Baccalaureate) intern in KU, Nepal. They were trained in providing clinical interventions to the CKD patients by the nephrologist, pharmacologist, and supervising pharmacist. They were trained in such a way that they might routinely provide care for the CKD patients in the future.

Table 1. Patient demographic characteristics.

Characteristics	Frequency	Percentage
Age of the patient (years)		
11–20	1	1.6
21–30	9	14.1
31–40	13	20.3
41–50	17	26.6
51–60	12	18.8
61–70	11	17.2
71+	1	1.6
Gender		
Male	46	71.9
Female	18	28.1
Smoking habit		
Past smoker	31	48.4
Nonsmoker	33	51.6
Alcohol intake		
Past alcoholic	36	56.2
Nonalcoholic	28	43.8
Educational status		
Illiterate	23	35.9
Up to 10 years of education	27	42.2
10–12 years of education	10	15.6
More than 12 years of education	4	6.3

Table 2. Chronic kidney disease (CKD)–related characteristics of the patient.

Characteristics	Frequency	Percentage
Years of CKD occurrence		
Less than 1 year	19	29.7
1–5 years	42	65.6
5–10 years	3	4.7
Family history of CKD		
Negative	59	92.2
Positive	5	7.8
Comorbidity		
Hypertension	51	79.7
Diabetes mellitus	10	15.6
Hypertension with diabetes mellitus	3	4.7

Study limitations

Single study site was selected for the study. Small sample size selected for, that is, 64, may be subjected to the problem of generalizability of the research findings. Only a single follow-up after counseling was taken because of the limited study period.

Results

Majority of the patients (26.6%) were found in the age group of 41–50 years (mean age of the patient = 46.66 ± 14.37 years). The research showed that 71.9% male patients and 28.1% female patients came for dialysis. The study found that 51.6% were past smokers but were presently nonsmokers, whereas 56.2% were past alcoholic but were presently nonalcoholic. The study found that 35.9% had no formal education at all, 42.2% were educated up to class 10, and only 6.3% had education beyond class 12 (Table 1).

Among the patients enrolled in the study, 65.6% had a history of CKD ranging from 1- to 5-year duration. Few patients (4.7%) had history of CKD for 5–10 years. Majority (92.2%) did not have family history of CKD, and 7.8% patients had a family history. Along with stage V CKD, comorbid conditions in the patients were hypertension (79.6%) and diabetes mellitus (15.6%). But none of the patients were on medications for the management of their disease states (Table 2).

The mean knowledge score of the case group after intervention was significantly higher than that before intervention (p value <0.001). Similarly, the mean attitude score changed from 38.19 ± 3.21 to 38.78 ± 3.03 after the intervention (p value < 0.001). The mean practice score of the case group patients following intervention was also significantly higher compared to the score before intervention (p value = 0.017). Although the knowledge score increased from 8.06 ± 4.25 to 8.22 ± 4.13 in the control group patients, the change was not statistically significant (p value = 0.258). The change

They only collected data from the control group patients for the comparison with the case group patients. The nephrologist and pharmacologist were aware of the information on who were allocated to the case groups and who were allocated to the control groups. The CKD patients enrolled in the hospital were provided nursing care by the on-duty nurses and dialysis technicians, but they were instructed about not providing any intervention related to CKD during the research period to avoid the possibility of obtaining biased results. Altogether, there were five nephrologists in the hospital, out of whom one nephrologist was actively involved in the research process. The impact of the pharmacist on the KAP scores was recorded in assistance with the nephrologist. The total score of the question for each KAP was calculated by summing up the score obtained in each question, and data so obtained were analyzed.

The data collected were reviewed, coded, verified, and statistically analyzed using the Statistical Package for Social Sciences (SPSS) version 17. The case group patients (total 32) were counseled with leaflet regarding KAP about disease, medication and dialysis, whereas the control group patients (total 32) were not counseled and not provided with leaflet. The effectiveness of counseling in terms of KAP outcomes was determined by comparing the mean KAP scores before and after intervention by applying paired sample t-tests. Descriptive statistics for the study variables and chi-square test of association were used for the analysis purpose. A p value < 0.05 was considered significant throughout the study.

Table 3. Comparison of knowledge, attitude, and practice scores of case and control groups.

Category	Case group			Control group		
	Score at baseline	Score at post-intervention	*p* value	Score at baseline	Score at post-intervention	*p* value
Knowledge score	8.16 ± 4.37	13.75 ± 3.51	0.000	8.06 ± 4.25	8.22 ± 4.13	0.258
Attitude score	38.19 ± 3.21	38.78 ± 3.03	0.000	37.94 ± 2.31	38.03 ± 2.23	0.325
Practice score	6.69 ± 0.89	6.91 ± 0.77	0.017	6.50 ± 0.80	6.59 ± 0.66	0.083

in baseline and post-follow-up attitude scores were also not statistically significant (*p* value = 0.325). The analysis of practice score also showed that the change at baseline and post-follow-up scores were not statistically significant (*p* value = 0.083) (Table 3).

Discussion

In 2005, Kerri et al.[9] conducted a study in 490 dialysis patients, which suggested that additional studies are needed to explore the impact of patient dialysis knowledge and its improvement after educational interventions. A study undertaken by the American Association of Kidney Patients in 2008 revealed that ESRD patients are not uniformly advised about all possible treatment methods and hence was only moderately satisfied with their pretreatment education.[10] In another study by Tang et al.,[11] the role of the clinical pharmacist in contributing to the care of patients receiving long-term hemodialysis in an outpatient dialysis unit was assessed in 205 cases. The study reported that 90.5% interventions by the clinical pharmacist resulted in positive patient outcome.[11]

The mean age of the patients in this study was similar to that in the research conducted by Chhetri et al.[12] (46.9 ± 17.9 years). More male than female patients visited the hemodialysis unit. Similar finding was revealed in an 8-year analysis in a tertiary care hospital of Nepal, which showed that male patients were predominant in all kidney disease syndromes.[13] However, a research finding in the United Kingdom reported that the prevalence of CKD is much higher in women than men, but as kidney function declines, the proportion of men with CKD increases.[14]

Most of the patients had history of hypertension and diabetes mellitus for a long time. The study by Keith[15] also revealed that the two main causes of CKD are diabetes and hypertension, which are responsible for up to two-thirds of the CKD cases. The baseline scores of both case and control group patients were similar, implying that both the case and control group patients had similar KAP behaviors before intervention. The baseline KAP result also suggested that patients had a poor perception of CKD. In comparison to the knowledge scores, the attitude and practice scores of the case group were not increased to a great extent. This might be due to the short intervention period of 1 month, limited follow-ups, and limited counseling sessions. Similar results were obtained in different studies in Nepal and India.[16,17] Thomas

et al.[4] revealed that awareness of patients about diet and medication through patient counseling was very effective in improving QoL in hemodialysis patients. Belagodu et al.[3] showed that clinical pharmacist–provided education was effective in improving adherence behavior of hemodialysis patients.

References

1. Fresenius Medical Care. ESRD patients in 2011: a global perspective, http://www.vision-fmc.com/files/download/ESRD/ESRD_Patients (accessed 6 June 2012).
2. Kafle RK. Current trends of transplantation in Nepal. *J Nephrol Ren Transplant* 2009; 2(1): 89–93.
3. Belagodu SS, Moda GN, Konana CG, et al. Impact of clinical pharmacist-provided education on medication adherence behaviour in ESRD patients on hemodialysis. *Iran J Pharma Sci* 2009; 5(1): 21–30.

4. Thomas D, Joseph J, Francis B, et al. Effect of patient counseling on quality of life of hemodialysis patients in India. *Pharm Pract* 2009; 7(3): 181–184.

5. Fredric OF, Kenneth S, Catherine F, et al. Perceived knowledge among patients cared for by nephrologists about chronic kidney disease and end-stage renal disease therapies. *Clin J Am Soc Nephrol* 2010; 5(2): 195–204.

6. Takeshi K, Mamiko A and Hiroya M. Impact of a pharmacist-implemented anemia management in outpatients with end-stage renal disease in Japan. *Biol Pharm Bull* 2004; 27(11): 1831–1833.

7. Castelino RL, Sathvik BS, Parthasarathi G, et al. Prevalence of medication-related problems among patients with renal compromise in an Indian hospital. *J Clin Pharm Ther* 2011; 36(4): 481–487.

8. National Kidney Center, Health Care Foundation—Nepal, http://www.hecaf.org/hecaf+nkc.html (accessed 4 June 2012).

9. Kerri L, Rebecca L, Raymond M, et al. Patient dialysis knowledge is associated with permanent arteriovenous access use in chronic hemodialysis. *Clin J Am Soc Nephrol* 2009; 4(5): 950–956.

10. Stephen Z, David R, Greg A, et al. Satisfaction with renal replacement therapy and education: the American Association of Kidney Patients survey. *Clin J Am Soc Nephrol* 2011; 6(3): 605–612.

11. Tang I, Vrahnos D, Hatoum H, et al. Effectiveness of clinical pharmacist interventions in a hemodialysis unit. *Clin Ther* 1993; 15(2): 459–464.

12. Chhetri PK, Manandhar DN, Tiwari R, et al. In-center hemodialysis for end stage kidney disease at Nepal Medical College and Teaching Hospital. *Nepal Med Coll J* 2009; 11(1): 61–63.

13. Agrawal RK, Hada R, Khakurel S, et al. Analysis of eight years data of renal disorders in a tertiary care hospital in Nepal. *Postgrad Med J NAMS* 2009; 9: 28–34.

14. Lusignan S, Chan T, Gallagher H, et al. Chronic kidney disease management in southeast England: a preliminary cross-sectional report from the QICKD – Quality Improvement in Chronic Kidney Disease study. *Prim Care Cardiovasc J* 2009; Special Issue: Chronic Kidney Disease: 33–39. DOI:10.3132/pccj.2009.034.

15. Keith N. Kidney disease in the minority community: the importance of education and screening. *aakpRENALIFE*, 2004; 19: 5, http://www.aakp.org/print-version/dsp_library_art.cfm?art=101.

16. Sharma S, Khanal A, Poudel B, et al. Knowledge, attitude and practice (KAP) outcomes: an effect of pharmacist provided counseling in hypertensive patients in tertiary care teaching hospital in Western Nepal. *Int J Pharm Sci* 2010; 2(2): 583–587.

17. Palaian S, Acharya LD, Rao PGM, et al. Knowledge, attitude and practice outcomes: evaluating the impact of counseling in hospitalized diabetic patients in India. *P&T* 2006; 31: 383–400.