

Adequacy of dialysis in patients of chronic kidney disease

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Objective: To study the different signs and symptoms of chronic kidney disease (CKD) in patients who are on dialysis and to study adequacy of dialysis.

Methodology: This prospective cross sectional study was conducted in Department of Medicine, Ayub Teaching Hospital, Abbottabad from December 2016 to April 2018. A sample of 100 patients of CKD on dialysis was selected by using non probability convenient sampling technique. Data were collected by using pre designed questionnaire and was analyzed by SPSS 16.

Results: Out of 100 patients, 59 were male and 41 females. Mean age was 42.3 ± 12.2 years (range 19-7). CKD was more prevalent in males with male to female ratio of 1.75:1. Weight loss was seen in 39%, vomiting in 24%, fatigue in 62%,

sleep disturbance in 28% and breathing problems in 26% patients. More than half of the patients had their hemoglobin levels between 8-10mg/dl and only 9% had hemoglobin more than 12mg/dl. Only 8% patients had blood urea levels less than 60mg/dl, 39% had their blood urea levels in range of 80-100mg/dl while 25% had urea more than 101mg/dl. Only 6% patients had their creatinine levels less than 3.3mg/dl and more than 75% have creatinine level above 5.4mg/dl.

Conclusion: CKD patients who were on regular and adequate dialysis had less uremic symptoms, mortality rates and good quality of life. (Rawal Med J 202;45:13-16).

Keywords: Chronic kidney diseases, dialysis, adequacy.

INTRODUCTION

Chronic kidney disease (CKD) is a group of heterogeneous disorders resulting in gradual and irreversible deterioration of renal function.^{1,2} About 10% of the world population falls a victim to this serious disease with one in five men and one in four women aged 65-74.³ Almost 11% of the population is affected in the United States.^{4,5} The figures are higher in the developing countries including Pakistan, where more than 100 people are affected in a million.^{5,6} Many disease lead to End Stage Renal Disease (ESRD), yet hypertension and diabetes are more notorious than all other causes combined.⁷ CKD has broad spectrum of clinical features which come under the umbrella of Uremia.^{2,7}

CKD is conservatively managed in geriatric patients, mainly hoping to achieve symptomatic relief without initiating interventional therapy.² However, Renal Replacement Therapy (RRT) is an approach for younger and novel patients of CKD. RRT offers two options; dialysis or renal transplant.

Dialysis should be initiated when GFR falls below 15ml/min along with clinical manifestations and is not dependent on urea or creatinine levels. Life threatening conditions may benefit from an earlier start.⁸ Dialysis can be hemodialysis and peritoneal dialysis. The former is more reliable procedure performed in the hospital. The latter however, has the advantage of the patient being independent of others and doing it at home. Between 2000 and 2008, five year survival rates rose from 35 to 50% in dialyzed patients. Mortality rates fell more than 20% in five years, thus making it a reliable option for CKD.⁵ Over 2 million people around the globe receive treatment for CKD but only 20% are from developing countries, hence creating a huge financial burden on themselves. This is the biggest limitation to achieving the expected outcome.⁵

Chronic kidney disease can be treated efficiently with timely diagnosis but many suffer due to the

financial burden. This necessitates a multidisciplinary approach involving governments, health care professionals and general public. This study was aimed to study the different sign and symptoms of CKD in patients who are on dialysis and to study adequacy of dialysis.

METHODOLOGY

This prospective cross sectional study was conducted in Department of Medicine, Ayub Teaching Hospital, Abbottabad, Pakistan from December 2016 to April 2018. A sample of 100 patients was selected by using non probability convenient sampling technique. Patients of CKD who were on dialysis were included in the study.

Statistical Analysis: Data was collected by using pre designed questionnaire and analyzed by SPSS version 16. Frequency and percentages were calculated for categorical variables while mean and standard deviation was calculated for continuous variables.

RESULTS

Among 100 patients, 59 were male and 41 were females. Male to female ratio approximately equal to 1.75:1. Mean age was 42.3 ± 12.2 (range 19-70) years. Three patients had CKD for less than 1 year, 20 had CKD from 1-3 years, 36 had CKD for 3-5 years and 41 had been suffering from disease for more than 5 years. Among them, 56% were getting 2 sessions of dialysis per week and 44% were getting 3 sessions per week.

Regarding symptoms and complaints, 39% patients had weight loss, 24% had vomiting, 62% fatigue, 28% had sleep disturbance and 26% had breathing problems (Fig. 1). Fatigue was the commonest symptom reported by 81.5% of patients.¹⁴ Regarding bone tenderness/pain, 65% had bone pains. Patient with CKD stage 5 on conservative management had serum calcium in normal range among 55% individuals, serum phosphate in 70.3% patients was in normal range and in 46.8% individuals serum PTH was in normal range (Fig. 2). All other individuals had altered mineral levels and only 21.6% patients had all the three perimeters were in normal range.

Fig. 1. Symptoms seen in patients after hemodialysis.

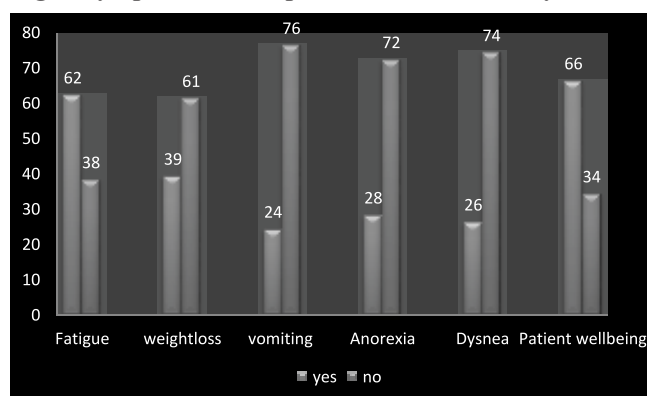


Fig. 2. Serum levels of Calcium, Phosphate and PTH.

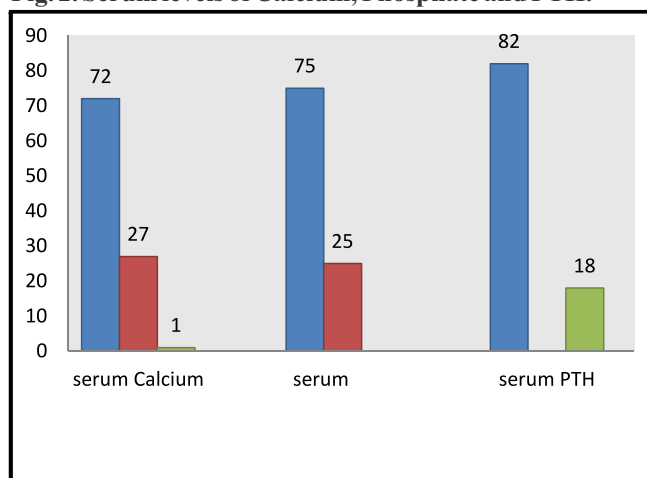


Fig. 3. Hemoglobin levels.

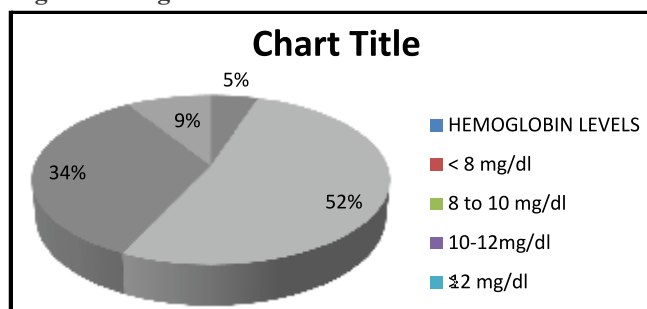


Table. Blood Urea levels.

Blood urea	Frequency
<60	8
61-80	28
81-100	39
>101	25

More than half of patients had their hemoglobin levels between 8-10mg/dl and only 9% individuals

had Hb more than 12mg/dl (Fig. 3). Regarding blood urea, most patients had 60-100mg/dl (Table). Only 6% patients had their creatinine levels less than 3.3mg/dl and more than 75% had creatinine level above 5.4mg/dl. Concerning serum creatinine, 57% of patients had values between 7-12 mg/dl before dialysis, whereas after dialysis in 58% of patients the values were reduced below 7 mg/dl.

DISCUSSION

Chronic renal failure is the progressive loss of function of kidney and patient requires a long treatment in the form of RRT. Hemodialysis is one of the renal replacement therapy, during which body's waste products, including creatinine, urea and excess water are removed. CKD is a disease of middle age group with highest prevalence of disease after the age of 40 years.⁸⁻¹⁰ CKD patients require more vigorous management to maintain homeostasis.¹¹

While patients who are managed conservatively have much higher percentage of symptoms, as results from a study from UK showed that patients managed conservatively had complaints of fatigue/tiredness in 71% to 97%, pruritus 55%, anorexia 49%, pain 47% to 82%, sleep disturbance 44%, anxiety 38%, dyspnea 11% to 55%, nausea 15% to 48%, restless legs 30%, and depression 27%.¹² Similar results were shown by another study conducted on patients managed without dialysis and had complaints of lack of energy 76%, pruritus 74%, drowsiness 65%, dyspnea 61%, edema 58%, pain 53%, dry mouth 50%, muscle cramps 50% and sleep disturbance 41%.¹³

While patients who are on regular dialysis had much decreased complaints than those who are managed conservatively. Except fatigue, all other symptoms regressed after dialysis. Results from another study also showed fatigue to be as the most common presenting complaint in people on regular dialysis with percentage of 75-80%.¹⁵ Causes of post dialysis fatigue are anemia, age, sex, psychological stress, anxiety, medication, decreased growth hormone and IGF.¹⁵ It is assumed that with new dialysis techniques, post dialysis fatigue and other symptoms can be decreased to a much lower level.

Chronic kidney disease alters the mineral metabolism in the body and result in hypocalcemia

and hyperphosphatemia, which result in high PTH. This requires active management. Effectiveness of RRT can be determined by results of serum calcium levels before and after dialysis in patients in which only 30% of patients had normal serum calcium levels before dialysis and after 3 year dialysis, 50% had normal calcium levels. Even better results were obtained after renal transplant in which 70% individuals got normal calcium levels.¹⁶

Results also shows that regular hemodialysis are more helpful in keeping mineral levels normal as seen people having 3 sessions per week have less hyperphosphatemia and hyperparathyroidism. This shows that more regular dialysis are helpful in controlling mineral metabolism.¹⁶ Another study showed 53% normal calcium levels, 57% normal phosphate levels and only 31% normal PTH levels among patients of CKD.¹⁵ CKD results in loss of erythropoietin, which is major factor contributing to anemia in these patients. A study from Japan showed that 36-50% of patients with CKD were anemic and administration of erythropoietin improved their hemoglobin.¹⁴

CONCLUSION

We conclude that the prevalence of chronic kidney disease is high in males and after the age of 40 years. Adequate dialysis is one of the best options for management of these patients, which raises the survival rate in CKD patients and also decreases the prevalence of sign and symptoms like weight loss, pruritus, anemia, uremia, vomiting leading to a good well-being of the patients.

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