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Original Article

Detection and co-ordinated care management of chronic kidney disease at Kathmandu Medical College Teaching Hospital

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Abstract

Objective: The objective of our study was to analyze the detection parameters, categorization and co-ordinated management of Chronic Kidney Disease (CKD). The presenting clinical features, common lab investigations, applied treatment protocols and noticed complications were recorded.

Methodology: A total of 40 patients of various stages of CKD on the basis of National Kidney Foundation (NKF), Kidney Disease Outcome Quality Initiative (K/DOQI) guideline were included in the study.

Result: Out of them 24(60%) were males and 16(40%) were females. Constitutional symptoms like anorexia, nausea and generalized weakness were common presenting complaints present in 37(92.5%) patients and were associated with features of anaemia, metabolic acidosis and fluid overload in stage 5 CKD patients. The average age of presentation was 51.3 years. Among 40 patients 21(52.5%) were managed conservatively, 17((42.5%) were advised for Renal Replacement Therapy (RRT) through dialysis.2 (5%) patient expired during the treatment. The average duration of hospital stay was 5.6 days. Diabetes Mellitus was the most common cause18 (45%), followed by Hypertension 14 (35%) and Chronic Glomerulonephritis (CGN) 5 (12.5%) leading to CKD. The patients were advised for regular follow up at Nephrology clinic.

Keywords: Chronic Kidney Disease, NKF, K/DOQI guideline, Diabetes Mellitus, Hypertension, Renal Replacement Therapy

Chronic Kidney disease (CKD) is the growing public health problem in Nepal with increasing incidence and prevalence. The disease may ultimately lead to end stage renal disease (ESRD) and may terminate to high mortality and morbidity in the lack of appropriate intervention. The US Renal Data System[1] estimated in a 2002 report that there are more than 450 000 persons with ESRD in the United States and that the rate of ESRD is increasing 5% to 6% per year. Long term adverse outcome associated with CKD include kidney failure, complication of impaired kidney function and more commonly increased risk for cardiovascular disease and death.[2]

Recent updated guidelines from The National Kidney Foundation (NKF) Kidney Disease Outcome Quality Initiative (K/DOQI) classify CKD into 5 stages according to GFR: Stage1 CKD (GFR≥90ml/min/1.73m^2), Stage2 CKD (GFR 60-89 ml/min/1.73m^2, Stage3 CKD (GFR 30-59 ml/min/1.73m^2, Stage4 CKD (GFR15-29ml/min/1.73m^2) and Stage5 CKD (GFR<15ml/min/1.73m^2 or patient undergoing dialysis).[3]

A essential feature of NKF guidelines is the use of GFR to identify and categorize CKD .The GFR is considered the best means of assessing total kidney function.[4] Serum Creatinine and Creatinine clearance are problematic because they overestimate the GFR (because of secreted creatinine) at low levels.[5]

Prompt identification and management of the disease help to slow the progression and prevent the complications. By identifying the CKD patients in early stages can be referred to the specialized nephrology centre where appropriate treatment can be installed, regular follow up can be done and renal replacement therapy can be used if needed. Early referral of renal patients and more importantly, effective nephrological management during the pre dialysis phase is crucial to improve the care of renal patients and reduce or retard the need for RRT and preserve the nutritional and cardiovascular condition of patients.[6]

Material and methods

This is a retrospective study of the admitted CKD patients undertaken at Department of Medicine, Kathmandu Medical College Teaching Hospital over a period of one year (1st Aug 2004 to 31st July 2005).

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All the suspected cases of CKD were evaluated; the presenting clinical features were recorded. Baseline haematology (TC, DC, HB%, ESR), Routine Urine Examination, Renal Function Test (Serum Urea /Creatinine, Na, K), Serum Calcium and Phosphorus were obtained. X-ray chest, USG abdomen and Echocardiogram were done for all the patients. The exclusion criteria were Acute Renal Failure and Septicemia. Glomerular Filtration Rate (GFR) was calculated using Cockroft-Gault formula. The staging of the patients were done according to NKF, K/DOQI guideline. The management installed and complication observed was recorded.

Result

Out of 40 patients included in the Study, 24(60%) were male and 16(40%) were female. Mean age of presentation was 51.3 years. The youngest being of 18 years and oldest of 82 years. Constitutional symptoms like anorexia, nausea and generalized weakness were common presenting complaints present in 37(92.5%) patients. Features of chronic anaemia metabolic acidosis and pulmonary oedema were also associated in26 (65%), 18(45%), and 16(40%) patients respectively. 12(30%) patients were of Stage5 CKD, 10(25%) patients were of Stage 3 CKD, 8(20%) patients were of Stage 4 CKD, 7(17.5%) patients were of Stage 2 CKD and 3(7.5%) patients were of Stage 1CKD. Diabetes Mellitus was the most common cause present in18 (45%) patients followed by Hypertension in 14(35%) patients and CGN in 5(12.5%) patients. Dietary modification was advised to all the 40(100%) patients. Diuretics were used in 30(75%) patients. Glycemic control and control of B.P was done for 32(80%) patients. Oral Iron supplement was given to 18(45%) patients and recombinant human erythropoietin (rhu EPO) to 15(37.5%) patients. Phosphate binders and vitamin D3 was given to 30(75%) patients. Appropriate antibiotics were required to 23(57.5%) patients. All the patients of stage 4 and 5 total of 20(50%) were advised for A-V fistula.

Among the most notable complications, Uraemic fits was seen in 4(10%) patients Stroke in 3(7.5%) patients and IHD in 2(5%) patients. One patient of Stroke and another of IHD expired in the hospital despite of treatment.

Table No 1: Characteristics of Patients (n=40)

Sex	
Male	24(60%)
Female	16(40%)
Age(yr)	
Mean age	51.3
Youngest	18
Oldest	82

Table No 2: Presenting Symptoms of study group

S.NO	**Symptoms**	**No of Patients**	**Percent (%)**
1	Constitutional symptoms	37	92.5
2	Chronic anaemia	26	65
3	Metabolic acidosis	18	45
4	Dyspnoea (pulmonary oedema)	16	40

Table No 3: Staging of CKD patients on the basis of NKF, K/DOQI guideline

S.NO	**Staging**	**NO of patients**	**Percent (%)**
1	Stage1 CKD (GFR≥90ml/min/1.73m^2)	3	7.5
2	Stage2 CKD (GFR 60-89 ml/min/1.73m^2)	7	17.5
3	Stage3 CKD (GFR 30-59 ml/min/1.73m^2)	10	25
4	Stage4 CKD (GFR15-29ml/min/1.73m^2)	8	20
5	Stage5 CKD (GFR<15ml/min/1.73m^2 or patient undergoing dialysis)	12	30

Table No 4: Common causes of CKD

S.NO	Causes	No of Patients	Percent (%)
1	Diabetes Mellitus	18	45
2	Hypertension	14	35
3	CGN	5	12.5
4	Others	3	7.5

Table No5: Distribution of hypertensive patients according to severity (n=14)

S.NO	Severity of Diastolic BP	NO of Patients	Percent (%)
1	Mild hypertensive (90-110 mm/Hg)	5	35.71
2	Moderate hypertensive (110-125mm/Hg	6	42.85
3	Severe hypertensive >125mm/hg	3	21.42

Table No 6: Calcium Phosphorus index and HB% of various stages of CKD

S.NO	Stages	Ca/Po_4 Index $_{(mg^2/dl^2)}$	HB%(gm/dl)
1	Stage1	45.6-50.4	9.8-10.7
2	Stage2	50.4-54.2	9.5-10.4
3	Stage3	54.6-58.6	9.3-10.1
4	Stage4	56.5-60.2	8.0-9.1
5	Stage5	58.5- 63.6	7.6-8.9

Flow Chart 1: Showing the Basic management Protocol applied to CKD patient

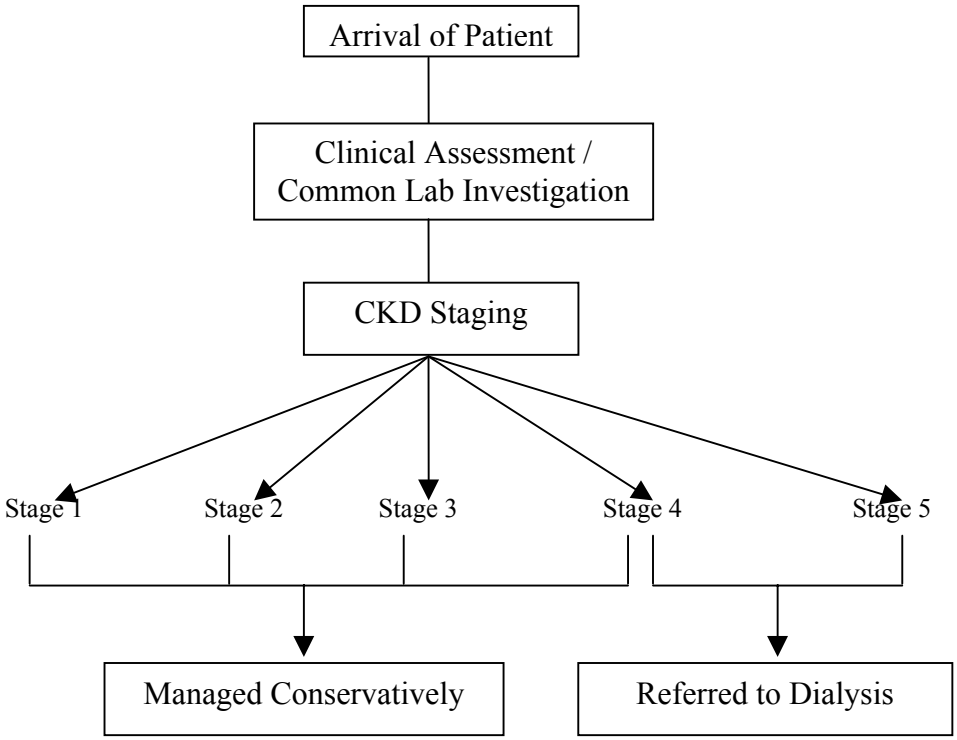

Table NO: 7 Brief Treatment protocols installed for Conservative Management of CKD.

S.NO	Conservative Management	NO. Of Patients	Percent (%)
1	Dietary Modification (low salt, protein).	40	100
2	Use of Diuretics.	30	75
3	Effective Glycemic and blood pressure control.	32	80
4	Oral Iron Supplementation.	18	45
5	Treatment of Metabolic Acidosis.	6	15
6	Use of Phosphate Binders.	30	75
7	Use of Recombinant Human Erythropoietin(rhuEPO)	15	37.5
8	Use of Vitamin D3.	30	75
9	Use of appropriate antibiotics.	23	57.5
10	Advised for A-V fistula creation	20	50

Table No 8: Major Complications observed during the study period

Complications	No Of Patients	Percent (%)
Uraemic Fits	4	10
Stroke	3	7.5
IHD	2	5

Discussion

Chronic Kidney Disease(CKD) is a significant public health concern.[7] An increasing number of patients with CKD progress every year to end stage renal insufficiency when they require dialysis replacement therapy.[8] For more than 10 years, the number of new patients accepted on renal replacement therapy (RRT) has been increasing by about 9% per year in USA.[9] The incidence and prevalence of CKD of various stages are increasing in the developing countries like Nepal, which warrants multidisciplinary clinical approach to slow the progress of disease.

The causes of CKD detected in our setting was in concordance with other studies.[3, 10] Diabetes Mellitus (DM) followed by Hypertension (HTN) and Chronic Glomerulonephritis (CGN) were the common causes. With the rising rates of Diabetes Mellitus and Hypertension in the aging population, it is projected that the prevalence of CKD will continue to increase.[1] Primary prevention of CKD could be undertaken in the condition such as diabetes mellitus and essential hypertension where the metabolic control (hyperglycaemia) and control of hypertension can retard the progress of chronic renal dysfunction.

Detection of Renal Disease relies on very simple clinical or laboratory signs.[11] Weakness, fatigue, headache and pruritis are common symptoms. Sign of hypertension, congestive heart failure, and oedema are often present. Presence of proteinurea with or without haematuria, raised serum Urea /Creatinine and altered kidney morphology on ultra sonogram are common abnormal investigations observed. The clinical feature of renal disease is often less evident as compared to other disease so the patient present late to seek the treatment, which make the treatment more complicated[12].

After the determination of GFR, NKF guidelines recommend staging of the patients. The NKF recommends that the management of patients with CKD stage 1 or 2 should focus on determination of diagnosis and developing a treatment plan that includes the co-morbid conditions and underlying cause of kidney disease.[13]

Feature of chronic anaemia were present in significant number of patients. Relative deficiency of erythropoietin being the cause, injection of erythropoietin significantly improved the patient's condition. It is recommended that patients with stage 3 CKD have haemoglobin level checked and if less than 12.5 gm/dl undergo an evaluation for anaemia.[14] We however have considered haemoglobin level less than 8 gm% for initiation of recombinant human Erythropoietin (rhuEPO). The outcome was excellent. Cost effectiveness of erythropoietin was however a problem. So oral Iron therapy was advised for them, though its role is controversial.

Studies have shown that hypertension accelerates Kidney disease. Glomerular hypertension facilitates the development of glomerulosclerosis. ACE inhibitor, Ca- channel blocker and clonidine showed good response. The blood pressure level of

130/85mm of Hg was achieved by mono or poly therapy of the above mentioned antihypertensive.

Frequent monitoring of Serum Parathyroid hormone (PTH), Phosphorus and Calcium is advised to evaluate the bone status in CKD patients. Use of Phosphate binders, supplementation of calcium and vitamin D-3 has proven beneficial for them.

Our study has shown 20(50%) patients with stage 4 and stage 5 CKD. All the patients with GFR less than 30 are advised to prepare for renal replacement therapy (RRT) and should be educated regarding it. Patients of Stage 4 and 5 were referred to vascular surgeon for the assessment and creation of A-V fistula.

Conclusion

CKD is an emergent public health concern of Nepal. Due to rising prevalence of Diabetes Mellitus and Hypertension, the disease incidence is expected to grow up further. Thus timely detection and co-ordinated care management of the patients provides satisfying outcome to prevent and slow the progression of the disease and possible complications. The team approach of physician and nurses with particular knowledge of Kidney Disease is helpful. We have found NKF, K/DOQI guidelines, simple and practical, for the detection, categorization and successful management of CKD.

References

1. US Renal Data System.USRDS2002 Annual Data Report: Atlas of End Stage Renal Disease in the United States. Bethesda, Md: National institute of Diabetes and Digestive and Kidney Disease, National Institutes of Health; 2002.
2. Collins A, Li S, Gibertson D ,et al. Chronic Kidney disease and cardiovascular disease in the Medicare population. Kidney Int Suppl 2003;87: S24-31.
3. Szromba C, Thies MA, Ossman SS. Advancing Chronic kidney Disease Care New Imperatives for Recognition and Intervention. Nephrology Nursing Journal 2002; Vol 29, No 6:547-559.
4. Levey AS, Corresh J, Balk E, et al.National Kidney Foundation practice guidelines for Chronic Kidney Disease Evaluation, Classification and stratification. Ann Intern Med 2003; 139:137-147.
5. Shemesh O, Golbertz H, Kriss JP Myers BD. Limitation of Creatinine as Filtration marker in glomerulopathic patients. Kidney Int 1985; 28:830-838.
6. Hood SA, Sondheimer JH. Impact of pre-ESRD management on dialysis outcome: a review.Semin Dial 1998; 11:175-180.
7. Lesley A Stevens, Susan E.P Cooper, R. Suneet Singh, Adeera Levin. Detection of chronic kidney disease in non-nephrology practices: An important focus for intervention. BC medical Journal July/August 2005; Vol 47, No 6:305-311
8. El Nahas AM. Chronic Renal Failure (CRF): A Holistic Approach. Gazi Medical Journal 1999; 10:93-99.
9. Obrador GT, PereiraBJG. Early referral to the nephrologist and timely initiation of renal replacement therapy: A paradigm shift in management of patients with chronic renal failure. Am J Kidney Dis 1998; 31:398-417.
10. Ismail N, Becker BN. Treatment options and strategies in uremia: Current trends and future directions. Semin Nephrol 1994; 14:282-291.
11. Jungers P. Screening for renal insufficiency: is it worth while? Is it feasible?. Nephrol Dial Transplant 1999; 14:2082-2084.
12. Adhikary L, Simkhada R. Successful management of idiopathic rapidly progressive glomerulonephritis with corticosteroids and cytotoxic agent.KUMJ 2005;11: 289-291.
13. National Kidney Foundation. K/DOQI Clinical Practice Guidelines for Chronic Kidney Disease: Guideline 5-Assessment of Proteinurea. Am J Kidney Dis.2002; 39(suppl 1):S93-S102.
14. 14. National Kidney Foundation.K/DOQI Clinical Practice Guidelines for Chronic Kidney Disease: Guideline 8-Association of level of GFR with Anaemia. Am J Kidney Dis2002; 39(suppl 1):S120-S127.