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STUDY OF ETIOLOGY OF CHRONIC KIDNEY DISEASE IN A TERITIARY CARE HOSPITAL IN KOLAR

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ABSTRACT

Introduction: Chronic kidney disease (CKD), also known as chronic renal disease, is a progressive loss in renal function over a period of months or years. The burden of chronic kidney disease (CKD) in India cannot be assessed accurately. With the westernisation of our society and increase in chronic morbidities increase in trend is expected in our country as well. The approximate prevalence of CKD is 800 per million population (pmp) and the incidence of end-stage renal disease (ESRD) is 150–200 pmp. The most common cause of CKD in population-based studies is diabetic nephropathy. Until recently, the government did not recognize CKD/ESRD as a significant problem in India. The treatment of chronic kidney disease and its advanced stage end stage renal disease is expensive and beyond the reach of average Indian. Thus it is crucial that prevention of chronic kidney disease has to be the goal of medical fraternity, government of India and the general public. To tackle the problem of limited access to renal replacement therapy, an important method would be to try and reduce the incidence of end stage renal disease and the need of renal replacement therapy by preventive measures. **Objective:** The aim of this study shall be to try to find the frequencies of occurrence of the etiologies as well as their temporal association to chronic kidney disease in a teritiary care hospital in kolar district. **Materials and Methods:** 100 patients of Chronic Kidney Disease undergoing haemodialysis in the renal dialysis unit of R.L. Jalappa Hospital, Kolar. **Results:** Detailed history was taken and examination will be carried out, noted and etiology association of various risk factors for CKD is determined according to their frequency of occurrence.

KEYWORDS: Chronic kidney disease, India, Epidemiology, prevention.

INTRODUCTION

Chronic kidney disease (CKD) and end-stage renal disease (ESRD) have become worldwide public health problems. World over the prevalence of CKD is on the rise. These conditions increase patient morbidity and mortality risks and put major economic strain on the health-care systems.

National Health and Nutrition Examination S urvey (NHANES) data shows that over the last decade (from 1994-2004) prevalence of CKD increased from 14.5% to 16.8% (15%rise). Stage wise prevalence is: stage 1, 5.7%; stage 2,5.4%; stage 3, 5.4%; stage 4/5, 0.4%.[1] In US alone, over 30 million people have been diagnosed to have CKD and it is estimated that over 6 million will need renal replacement therapy.

Diabetes and Hypertension account for around two-thirds cases of CKD and unfortunately prevalence of both these lifestyle diseases is increasing. Additionally life expectancy is also increasing steadily, so put together burden of CKD is increasing exponentially. The population of India exceeds one billion and is projected to become the major reservoir of chronic diseases like diabetes and hypertension. The average crude and age adjusted incidence rates of ESRD in India ranged from 151-232 per million population respectively.[2] With 25–40% of these subjects likely to develop CKD, the ESRD burden will rise, and the health-care system would need to take care of these individuals.[3]

CKD is defined as kidney damage evidenced by structural or functional abnormalities of the kidney with or without decreased GFR over a three months period. Staging of CKD into grades 1-5 according to the severity is based on the National Kidney Disease Outcomes Quality Initiative (KDOQI) criteria.[4]

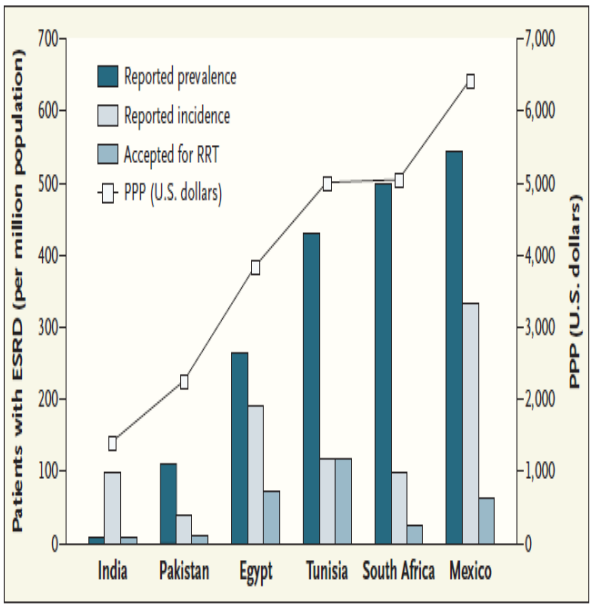
KDOQI Staging of CKD

Table 1

STAGES OF CKD		
Stage	Description	GFR (mL/min/1.73 m²)
1	Kidney damage* with normal or increased GFR	≥90
2	Kidney damage* with mildly decreased GFR	60-89
3	Moderately decreased GFR	30-59
4	Severely decreased GFR	15-29
5	Kidney failure	<15 or dialysis

*Kidney damage: pathologic abnormalities or markers of damage, including abnormalities in blood or urine tests or imaging studies.
CKD = chronic kidney disease; GFR = glomerular filtration rate.
Adapted from reference 4.

According to World Health organization (WHO) Global Burden of Disease project, diseases of the kidney and urinary tract contribute to global burden with approximately 850,000 deaths every year and 115,010,107 disability adjusted life years. CKD 12th leading cause of death and 17th cause of disability. Patients with CKD are at high risk for cardiovascular disease (CVD) and cerebro vascular disease (CBVD) and they are more likely to die of CVD than to develop end-stage renal failure.



Reported Prevalence and Incidence of ESRD and Rates of Acceptance for Renal-Replacement Therapy (RRT), in Relation to Wealth.

Chronic glomerulonephritis and interstitial nephritis are currently the principal causes of chronic kidney disease in developing countries. Diabetes causes 9.1 to 29.9 percent of the cases of ESRD in various developing countries, and hypertension leads to 13 to 21 percent of the cases. Other important causes include uro lithiasis with subsequent obstruction and infection, long-term drug abuse, and possibly environmental pollution.[5]

According to the first annual report published by the CKD registry of India involving 13,151 patients, diabetes and hypertension were major causes of CKD in India accounting for 28.5% and 16.2% respectively as in other parts of the world.[6] In the other community based study, diabetes, hypertension and chronic glomerulonephritis accounted for 41%, 22% and 16% of cases of CKD, respectively.

Table 3: Classification of Chronic Kidney Disease by Pathology and Aetiology

Pathology	Aetiology
Diabetic glomerulosclerosis	Diabetes mellitus (type 1 & 2)
Glomerular diseases (primary or secondary)	Largely unknown
Proliferative glomerulonephritis	Systemic lupus erythematous, vasculitis, hepatitis B or C, human immunodeficiency virus (HIV) bacterial endocarditis
Minimal change disease	Hodgkin's disease
Focal glomerular sclerosis	HIV, heroin toxicity
Membranous nephropathy	Drug toxicity, solid tumours
Fibrillary glomerular diseases	Amyloidosis, light chain disease
Hereditary nephritis	Alport's syndrome
Vascular diseases	
Diseases of large size vessels	Renal artery stenosis, aortoarteritis
Diseases of medium size vessels (nephrosclerosis)	Hypertension
Diseases of small vessels (microangiopathy)	Haemolytic uraemic syndrome, vasculitis, sickle cell disease
Tubulointerstitial diseases	
Tubulointerstitial nephritis	Infections, drugs, sarcoidosis
Reflux nephropathy	Vesico-ureteric reflux
Obstructive nephropathy	Stones, prostatism, malignancy
Myeloma kidney	Multiple myeloma
Cystic diseases	
Polycystic kidney disease	Autosomal dominant or recessive
Tuberous sclerosis	
Von-Hippel-Lindau disease	
Medullary cystic disease	

OBJECTIVE

The objective of the study is to determine various etiologies of CKD.

MATERIALS AND METHODS

For this retrospective cross sectional study all ESRD patients (creatinine clearance <15 ml/min) in Nephrology and renal dialysis unit of R.L. Jalappa hospital during the month of February 2015 were taken. Ethical approval and hospital permission was taken.

Hundread patients of chronic renal failure were included through non-probability, purposive sampling. patients of chronic renal failure ranging from 19-85 years of age regardless of gender who were on haemodialysis for more than 6 months were included.

Acute and acute on chronic renal failure were excluded by the history, physical examination with exclusion of reversible factors like infection, dehydration, nephrotoxic drugs, investigations including ultra sonogram of abdomen(USG) showing normal kidneys and hydronephrosis without thinning of cortex, reversibility on treatment and follow up. Renal transplant patients and patients on peritoneal dialysis were excluded.

Each patient was counted only once as a new ERSD despite of several admission for different problems. Different etiological diagnosis was reached from history, examination, investigations including urine analysis, haematological tests, biochemical parameters, radiological investigations including USG abdomen, X ray chest and X ray KUB. Creatinine clearance was calculated by Cockroft and Gault formula. Electrocardiogram (ECG) was done in all cases and echocardiography was done in selected cases. Statistical analysis was done by statistical package for social science version 13 for windows.

RESULTS

A Total number of 100 ESRD patients during the period were included of which 69 were male and 31 were female. The mean age of patients was 46 years with 66.3% patients in the age group 20-59 years.

Diabetic Nephropathy is the leading cause followed by hypertensive nephrosclerosis and chronic glomerulonephritis. Other causes were chronic tubule interstitial nephritis, ischaemic renal disease. In 18.1% patients the cause of ESRD could not be ascertained.

The mean age varied with different diseases being low in chronic glomerulonephritis and chronic pyelonephritis and higher in diabetic nephropathy, hypertensive nephrosclerosis and ADPKD. Chronic glomerulonephritis was the commonest cause of ESRD in all age groups below 60 years while diabetic nephropathy was the commonest cause in age group 60-79 years.

Presenting features were uraemic symptoms (65.8%), uraemic encephalopathy (3.7%), fluid overload (15.3%), acidosis (5.3%), oliguria (10%), swelling of the body(7.8%), generalized weakness (5%), epistaxis (3.4%), pruritus (1.5%), chest pain and haemoptysis (0.9%) and muscle cramp (0.6%).

Biochemical investigations revealed blood urea 190 + 67 mg %, serum creatinine 10.6 + 8.7 mg%, serum sodium 134.7 + 11 meq /L and serum K 5.0 + 3.0 meq/L, serum calcium 8.1+ 1.2mg % and serum phosphorous 6.6 + 2.8 mg%. Mean Hb was 7.3 +1.7 gm.

COMPARISION OF VARIOUS ETIOLOGIES OF CKD ACCORDING TO AGE

Diagnosis						
	<20	20-39	40-59	60-79	>79	Total
Diabetic nephropathy	0	0	22	18	0	40
Hypertensive glomerulosclerosis	0	0	18	17	0	35
Chronic glomerulonephropathy	10	2	0	0	0	12
Obstructive Uropathy	0	0	0	2	1	3
Autosomal dominant polycystic kidney disease (ADPKD)	0	0	2	0	0	2
Chronic pyelonephritis	0	0	2	0	0	2
Chronic tubulointerstitial nephritis	0	0	1	0	0	1
Rapidly progressive glomerulonephropathy	0	0	1	1	0	2
Ishcaemic renal disease	0	0	1	1	0	2
Unexplained causes	0	0	0	1	0	1
Total	10	2	47	40	1	100

DISCUSSION

The cause of end stage renal disease varies in different part of the world with diabetic nephropathy being the leading cause worldwide. The number of diabetic ESRD population is increasing as diabetes is on the rise and people with diabetes are living longer. Diabetic nephropathy now accounts for 44% of all new ESRD in US. CGN is a leading cause of ESRD in developing countries like India, Pakistan and Bangladesh although recent population based study in India had shown diabetic nephropathy as the leading cause of ESRD.[7]

In Present study Diabetic nephropathy is the commonest cause of ESRD followed by Hypertensive nephropathy and CGN. Some patients presented very late in the disease and hence the cause could not be ascertained in few cases.

Chronic pyelonephritis that constituted 2.0% of our cases was probably under diagnosed.

The mean age of the patients with ESRD was younger with two third of all cases in 20-60 age group compared to developed countries where the elderly ESRD population is increasing.

Most patients could not afford the cost of erythropoietin and hence blood transfusion was the mode of therapy.

As per Sakhuja et al. less than 10% of all patients in India and Pakistan receive any kind of renal replacement therapy as majority of patients starting dialysis stop treatment within the fi rst three months due to financial constraints and only 5% go for renal transplant.[8]

CONCLUSION

Diabetic nephropathy is the leading cause of ESRD in our context followed by Hypertensive nephrosclerosis and CGN. It affects younger age group people in their productive life. Most of the disease could have been prevented through screening programme. Development and progression of many complications can be prevented with better control of these chronic disease. ESRD treatment is costly, not available in most parts of the country and unaffordable by most people. Early recognition of CKD cannot only prevent development of ESKD but helps in controlling CV events. The government has to institute public health programmes for early detection and appropriate management of these lifestyle diseases, simultaneously increasing awareness about adopting a healthier lifestyle. Prevention remains the only way to fight the impending epidemic of CKD. This highlights the need for health education for prevention and early detection of chronic kidney disease. With better control of diabetes and hypertension, nationwise incidence of CKD can be brought down.

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