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Chronic kidney disease: Epidemiologic study

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Abstract

Chronic kidney disease (CKD) is set in 5 stages of increasing severity with a decrease in glomerular filteration rate leading to end stage renal disease(ESRD) requring a treatment of substitution,dialysis or transplantation. CKD is frequent , it increases with age ,and effects one person out of ten in the general population,and only 4 per 1,00,000 will reach end stage renal disesase(ESRD). As soon as it occurs , CKD is associated with increased cardio vacsular comorbid condition.Mortality in dialysis is far higher than in the general population.In France , more than 4billion euros per year, that is 2%of overall health expenditures or dedicated to the treatment of 0.11%of the population.It is therefore at the early stahlges of CKD that the efforts of screening and prevention ofESRD should be targeted.

Keywords: Chronic kidney disease, ESRD, Cardiovascular comorbidity.

Introduction

Kidney disease means that a person kidneys are damaged and cannot be able to filter the blood.This can cause storage of waste in our body.This leads to damage of other organs and may cause death.It increases the risk factors in our body. It increases risk for other conditions like diabetes, high blood pressure, cardio vascular problems. Kidney diseases are categorised into two types based on the severity.They are Acute kidney disease (AKD), Chronic kidney disease (CKD). Acute condition occurs suddenly in which waste from blood cannot be filtered.It may be fatal.It develops rapidly from few hours or days, were as Chronic kidney disease occurs over a period of long time that may be over many years.This condition causes decreased kidney function.This may lead to end stage renal disease (ESRD).Their are Five stages of CKD [1]. They are

- **Stage 1**: Kidney damage with normal kidney function.(Estimated GFR ≥90ml per minute per 1.7 m^2) and persistent (≥3months) proteinuria.
- **Stage 2**: Damage with mild loss of function of kidney (Estimated GFR60-89ml/min per1.7m^2 and persistent (≥3months) proteinuria.
- **Stage 3**: Mild- severe loss of kidney function (estimated GFR 30-59 ml/min per1.7m^2) and persistent (≥3months) proteinuria.
- **Stage 4**: Severe loss of kidney function (estimated GFR 15-29 ml/min per 1.7m^2) and persistent (≥3months) proteinuria.
- **Stage 5** : Requring dialysis or transplantation for the survival. This condition is also known as end stage renal disease (estimated GFR<15 ml/ min per 1.7m^2)

These are the conditions that occur during chronic kidney disease.In the early stages of CKD few signs & symptoms may occur but may not become apparent until kidney function is impaired significantly [2].

Signs and symptoms

These are often nonspecific, which means they may be caused by others illnesses.This is because kidneys are highly adaptable and also able to compensate for lost function.These signs and symptoms may not appear until irreversible damage as occurred.

- Nausea
- Hypertension
- Muscle cramps

- Insomnia
- Swelling of feet
- Fatigue and weakness
- Loss of appetite
- Chest pain.

There are various causes for this disease. That may be due to other illness in our body which are under lying.

Causes

- Type-1or Type-2 diabetes
- Hypertension
- Glomerular nephritis
- Pyelonephritis
- Poly cystic kidney disease
- Obstruction in urinary tract.

  These are the major causes for impairing kidney function that leads to worsen kidney damage

Epidemiology

High blood pressure and Diabetes are the main cause of CKD.Almost half of the individual with CKD reported with diabetes or CVD. More than 661,000 Americans have kidney failure.Of these,468,000 individual are on dialysis, and roughly 193,000 live with a functioning kidney transplant. Each year, kidney disease kills more people than breast or prostate cancer.In 2013, more than 47,000Americans died from Kidney disease.Expectancy of life increases the prevalence of diseases through various ways.On note of CKD United States has seen a increase of 35% of prevalence in CKD from last two decades. In india hypertension and diabetes account to 60% of cases of CKD.The prevalence of hypertension in adults reported is 16%.(14% from rural,21% from urban In india the exact disease burden of ESRD or CKD cannot be assessed accurately due to absence of renal registry [1].

A multi stage cluster sampling technique in North India based on urine samples and serum creatinine were and studied, Prevalence of CKD stage 3 and beyond was found in 0.79% subjects out of 4,972.Diagnosis was based on repeat sample after 2-3months of chronic renal disease. A study of South Indian reported a prevalence of impaired kidney function is 8.6/1000 in a population of 25,000 (on bases of GFR). CKD most commonly seen in proximately 30% of diabetes mellitus patients,97% cases in Type-2 diabetes.

A recent study on central government employees about 3,398 in india reported 15% of prevalence of CKD in early stages only. The prevalence of CKD and its stages are given as stage 1 about 7%, stage 2 about 4.3%, stage 3 about 4.3%, stage 4 about 0.8%, stage 5 about 0.8% are declared using MDRD Equation (Modification of diet in Prevalence of CKD and its stages based on MDRD Equation [2].

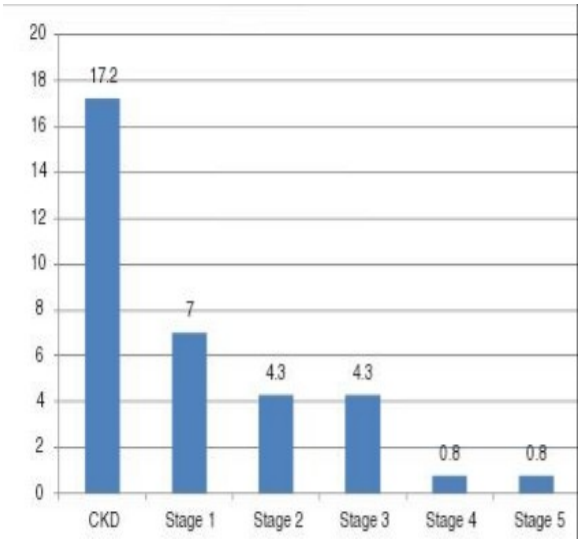

Fig: 01 Prevalence of CKD

Chronic kidney disease are affected to different age group people in different ways . Mostly women are affected because of conditions such as lupus and kidney infections frequently. Males are resistable and are not prone to infections so that defects are less common than females. On coming to the point of age mostly elder people are effected because of the body condition and medical history of an individual. These causes a greater variation of effects on different age group people based on the health condition [3-5].

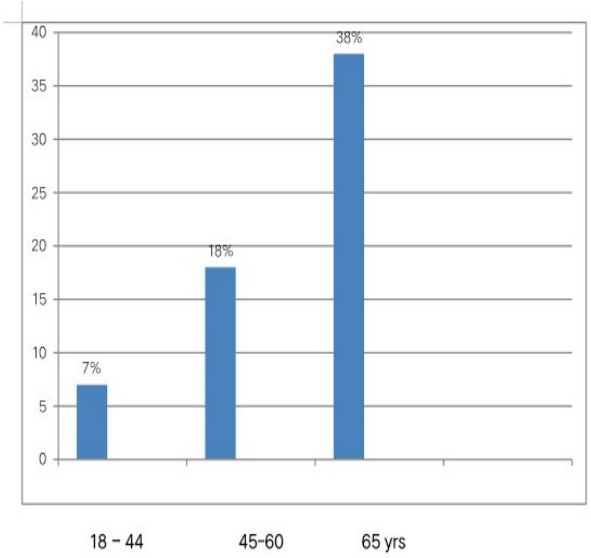

Fig: 02 Chronic kidney disease based on age group

On comparison of diabetic Patients majorly type2 diabetes mellitus patients are effected when we to type 1 .As we know that type 2 is milder but can cause major health issues or complications in the tiny blood vessels in the kidney, nerves, and also in eyes. This can also cause risk of heart diseases and also may cause stroke.

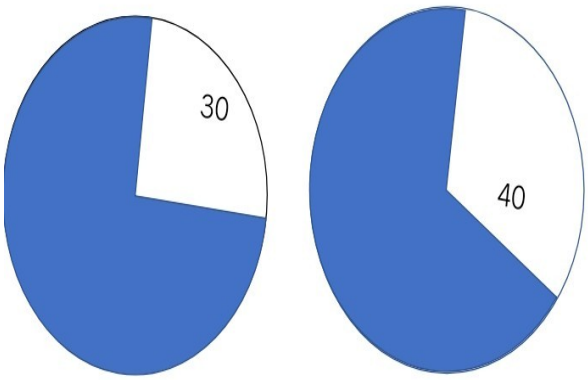

Fig: 03 Schematic representation of people having CKD with Diabetes.

High blood pressure is the second leading cause of kidney failure and cause harm to function of kidney over a short period of time. About 73 million adults in America have high blood pressure about one in three.About halt of people with hypertension have condition under their control.More than 20% of people aged 20 years are older with hypertension have CKD. The prevalence of hypertension in patients with renal vascular disease (93%)and in patients with diabetic nephropathy (87%)and 74% of patients with poly cystic kidney disease 63% of patients with pyelonephritis and 54% with glomerulo nephritis [6].

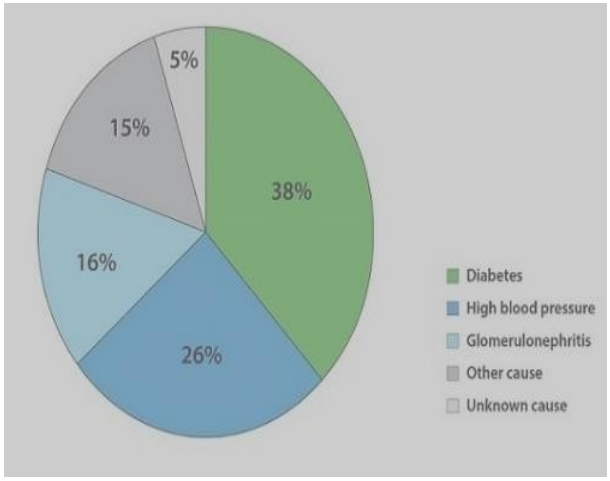

Fig: 03 Incidence of Type 1 Diabetes mellitus

Conclusion

Patients having high blood pressure and Diabetes mellitus are prone to CKD than compared to any other causes. These are potent risks for causing chronic kidney diseases. So patient with abnormality in blood pressure and Diabetes are periodically should be screened for renal tests.

Author Contrubution

All authors are contributed equally.

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