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RESEARCH ARTICLE

CHRONIC KIDNEY DISEASE AND ITS CAUSAL FACTORS.

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Abstract

Introduction: A case control analytical study , carried out among the patients of chronic kidney disease (CKD) to find out the casual factors of the disease. Objective of the study was to identify major casual factors of the disease to determine association of those factors with formation and progression of the disease i.e. CKD.

Methodology: A case control analytical study was carried out among patients of chronic kidney disease (CKD) to find out the casual factors of the disease. Study included all patients (all ages and both sex) , visiting dialysis unit, minimum duration of diseases 6 months and fifth stage of five stages of kidney disease is looked for. A sample of 32 patients of CKD from Nephrology Unit Bahawal Victoria Hospital , Bahawalpur is selected & information gathered through filling ofstructured Questionnaire to find out the factors leading to the formation of the disease. The whole study took time duration of approximately 6 months.

Results: Total32 conveniently selected patients were inducted in the study. Only 5 (15.6%) out of32 had a family history of CKD, 25 were suffering from hypertension, 7 were suffering from Diabetes & just 3 had taken Hakeem medication for their disease and 9 patients had kidney inflammation and urinary obstruction.

Conclusion: According to our study, there are two major causes of Kidney disease. One of them is Diabetes. High blood sugar levels caused bydiabetes damage blood vessels in the kidneys. If the blood sugar level remains high over many years, this damage gradually reduces the function of the kidneys leading to CKD. Second major cause of CKD is High blood pressure (hypertension). Uncontrolled high blood pressure damages blood vessels, which can lead to damage in the kidneys. Also, long-term use of medicines can damage the kidneys.

Introduction:-

Chronic kidney disease is a worldwide public health problem. In developed as well as developing countries, the incidence and prevalence of kidney failure are rising, the outcomes are poor and costs are high.

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Chronic kidney disease is defined as either kidney damage or diseased kidney function (decreased GFR) for 3 or more months.

The world health organization estimates that more than 180 million people around the world have diabetes and 10 to 20 percent of them will die of renal failure, as diabetes and hypertension are the leading causes of renal failure worldwide.

In Pakistan , there are about 35 million people suffering from diabetes and at least 40 percent of them will end up in developing chronic kidney disease. With the sixth largest population of diabetic patients in the world, Pakistan is encountering a rapid rise in kidney diseases.

Chronic kidney disease is a five stage progressive loss of kidney function over a period of months or years. Chronic kidney disease describes abnormal kidney function and / or structure. It is common, frequently unrecognized and often exists with other conditions such as cardiovascular diseases and diabetes. Moderate to severe CKD is also associated with an increased risk of other significant adverse outcomes such as acute kidney injury, falls, frailty and mortality. The risk of developing CKD increases with age .as kidney dysfunction progresses, some co-existing conditions become more common and increase in severity . CKD can progress to renal failure in small but significant percentage of people.

The classification of CKD has evolved over time. In 2004 , the department of National Health Service framework for renal services adopted the 2002 US National Kidney Foundation Kidney Disease Outcomes Quality Initiative classification of chronic kidney disease. The classification divides CKD in 5 stages and uses the combination of an index of kidney function , the GFR , and markers of kidney damage to define the stages.

Stage 1 and 2 were defined by the presence of kidney damage including albuminuria , urine sediment abnormalities , electrolyte and other abnormalities caused by tubular disorders , abnormalities detected by histology, structural abnormalities detected by imaging and a history of kidney transplantation.
Stage 3-5 were defined by a GFR less than 60ml/min/1.73m^2 with or without markers of kidney damage , on at least 2 separate occasions separated by at least aperiod of 90 days.

Kidney Disease Improving Global Outcome GFR Categories

GFR category	GFR (ml/min/1.73 m^2)	Terms
G1	> 90	Normal or high
G2	60-89	Mildly decreased*
G3a	45-59	Mildly to moderately decreased
G3b	30-44	Moderately to severely decreased
G4	15-29	Severely decreased
G5	<15	Kidney failure

- Relative to young adult level
- Reprinted with permission from Kidney Disease Improving Global Outcomes (KDIGO) CKD Work Group (2013) KIDGO 2012 clinical practice guidelines for the evaluation and management of chronic kidney disease. Kidney International(Suppl. 3):1-150

Materials & Methods:-

A descriptive case series study was conducted at Nephrology unit of Bahawal Victoria Hospital , Bahawalpur , over a six month duration. Study included patients (all ages and both sex), visiting dialysis unit. Minimum duration of disease being 6 months and fifth stage of disease i.e. CKD. Patients with First four stages of CKD were excluded. 32 cases were included by non probability convenient sampling. Data is described in the form of mean , standard deviation and the significance of the results is tested through chi-square. Structured questionnaire form was developed to get related information (social , economic , demographic and confounders related to outcome variables i.e. CKD. Another tool of measurement is Gantt Chart.

Results:-

Among the total 32 patients, 21(65.6%) were married and 25(78.1%) were illiterate. 43.8% belong to family having income less than 6000 PKR. Only 5 (15.6%) have family history of CKD. Patients > 30 years of age are more to have this disease i.e. 19 (59.4%). Out of 32 , 25 (78.1%) are suffering from hypertension and 16 (50%) were taking medication for hypertension. 12 patients (37.5%) have their BP maintained at 140/90. Only 7 (21.9%) are suffering from Diabetes and taking Insulin to maintain their BSR. 6 Patients (18.8%) have their blood sugar maintained below 126mg/dl. Just 3 (9.4%) have taken Hakeem medication for their disease and 9 (28.1%) patients have kidney inflammation and urinary obstruction. The association of duration of CKD with age , gender , hypertension , DM and Hakeem medication is insignificant but there is risk of development of disease for longer duration among patients less than 30 years, diabetes and hypertension.

Table # 1

Gender	Frequency	Percent
Male	9	28.1
Female	23	71.9
Total	32	100.0

Table # 2

Marital Status	Frequency	Percent
Married	21	65.6
Unmarried	10	31.3
Widow	1	3.1
Total	32	100.0

Table # 3

Education of Husband/Spouse	Frequency	Percent
Illiterate	25	78.1
Below Metric	1	3.1
Above Metric	2	6.3
Post Graduation	4	12.5
Total	32	100.0

Table # 6

Taking any Medication for hypertension	Frequency	Percent
Yes	16	50.0
No	16	50.0
Total	32	100.0

Table # 7

BP maintained 140/90	Frequency	Percent
Yes	12	37.5
No	20	62.5
Total	32	100.0

Table # 8

Suffering from DM	Frequency	Percent
Yes	7	21.9
No	25	78.1
Total	32	100.0

Table # 4

Family history of CKD	Frequency	Percent
Yes	5	15.6
No	27	84.4
Total	32	100.0

Table # 5

Suffering from hypertension	Frequency	Percent
Yes	25	78.1
No	7	21.9
Total	32	100.0

Table # 9

Name of the drug	Frequency	Percent
Insulin	7	21.9
No	25	78.1
Total	32	100.0

Table # 10

Blood Sugar maintained below 126 mg/dl	Freq.	Percent
Yes	6	18.8
No	26	81.3
Total	32	100.0

Table # 11

Taken any Hakeem medication	Freq.	Percent
Yes	3	9.4
No	29	90.6
Total	32	100.0

Table # 12

Kidney inflammation	Frequency	Percent
Yes	9	28.1
No	23	71.9
Total	32	100.0

Table # 15

Age	Frequency	Percent
≤ 30	13	40.6
> 30	19	59.4
Total	32	100.0

Table # 16

Total No of family members	Freq.	Percent
≤5	14	43.8
>5	18	56.3
Total	32	100.0

Table # 17

Income/capita/month	Frequency	Percent
≤30000	14	43.8
>30000	18	56.3
Total	32	100.0

Table # 13

Urinary Obstruction	Frequency	Percent
Yes	9	28.1
No	23	71.9
Total	32	100.0

Table # 14

Obstruction Bilateral	Frequency	Percent
Yes	5	15.6
No	27	84.4
Total	32	100.0

Analysis Of Data:-

Table # 18 n=32

Gender	Duration of CKD		Total	P-value	Chi-sq Odds ratio
	≤ 5 years	> 5 years			
Male	6	3	9	F.E.T	O.R = 0.71
Female	17	6	23	P=0.498	
Age 2					
≤ 30	11	2	13	F.E.T	O.R = 3.21
> 30	12	7	19	P=0.178	
Suffering from hypertension					
Yes	18	7	25	F.E.T	O.R = 1.03
No	5	2	7	P=0.652	
Suffering from Diabetes Mellitus					
Yes	6	1	7	F.E.T	O.R = 2.82
No	17	8	25	P=0.342	
Taken any Hakeem medication					
Yes	2	1	3	F.E.T	O.R = 0.76
No	21	8	29	P=0.642	

Discussion:-

Chronic kidney disease (CKD) is a five stage progressive loss of renal function over a period of months or years. Each stage is aprogression through an abnormally low and deteriorating glomerular filtration rate , which is usually determined indirectly by the Creatinine level in blood serum. When kidney disease progresses, it may lead to kidney failure and may need dialysis or a kidney transplant to maintain life.

CKD can be caused by diabetes , high blood pressure and other disorders. It can be detected by simple tests of , BP , urine albumin level and serum Creatinine levels[1]. Early detection and treatment of CKD can help prevent patient's condition getting worst. CKD afflicts people all over the world and thus there is an urgent need for all countries to have a public health policy for dealing with it. In the USA for example , CKD is a serious public health problem , with national surveys showing a considerably higher prevalence than appreciated previously[2,3].

According to the analysis of National Kidney Foundation in the USA, 30 million Americans have CKD and another 20 million are at an increased risk of developing it. The American Diabetes Association (ADA) has stated that 20-30% of individuals with diabetes develop CKD. This is in spite of the facts the USA has good quality medical care and the CKD is one of the most preventable of the many serious complications of diabetes. According to Josef Coresh'sstudy of data from National Health and Nutrition Examination Surveys (NHANES), 10% of Americans had CKD between 1988 and 1994, and 13% between 1999 and 2004[4,5].

Driving the increase , is a dramatic rise in diabetes and high blood pressure. Each of these conditions can lead to CKD. In Taiwan , for another example , CKD is the eighth leading cause of death. The mortality rate increased from 11.39% per 100,000 populations in 1990 to 20.8% per 100,000 population in 2004. The incidence of end stage renal disease (ESRD) in Taiwan is the highest in the world according to ESRDS 2002 statistics. In the same year the incidence of CKD in Taiwan ranked as the second highest in the world, just after Japan. Hsu (2006) rates the prevalence of CKD stages 3-5 in Taiwan at 6.9% [6].Research also concludes that the high prevalence and low awareness of CKD in Taiwan show the need to advocate more strongly for CKD prevention and education for both physicians , patients and general population[6].

Dialysis and kidney transplant are too costly for a large number of people living outside the industrialised world and even too costly for a large number of patients living in industrialised countries. For these people, prevention , early detection, and intervention are the only cost effective strategies for CKD treatment. For public health programmes based on prevention , early detection and intervention , to succeed , however the informed ant active participation of public is required. Health education programmes can deal with the informed part of it , but not with all aspects of active participation by public. One important factor in how willingly and actively people participate in a public health programme is their perceptions of the quality of the health programme service. Perceptions that quality of the service is poor , will result in less willing and less active participation. Thus accurate and practical measurement tools for assessing participant's perceptions of the quality of health care services are important. Results of such assessments can be used for determining areas with perceived and/or actual poor service quality, so that the service quality and/or the perception of service quality of those areas can be addressed and improved.

Conclusion:-

According to our study , diabetes and high blood pressure are the most common cause of chronic kidney disease that lead to kidney failure. High blood sugar levels caused by diabetes , damage blood vessels in the kidneys. If the blood sugar levels remain high over many years , this gradually reduces the functions of kidneys leading to CKD. Second major cause of CKD is high blood pressure (hypertension). Uncontrolled hypertension damages blood vessels which can lead to damage in kidneys. Also long term use of medications to control these diseases and others can damage the kidneys.

As 78.1 % of patients found to have CKD were illiterate , so increasing the awareness and training regarding self care , about controlling their blood sugar levels and blood pressure can help prevent or slow down kidney damage and obstruction. According to information gathered from patients , they were not aware of importance of exercise and balanced diet for healthy normal functioning human organs. Moreover , they are using Hakeem Medication and over the counter (OTC) drugs without any prescription, leading to irreversible kidney damage.

Recommendations:-

1. It is important to control the blood sugar levels with diet , exercise and medication. Self care and self assessment is also important for long term benefits in CKD.
2. Patients should follow a diet healthy for kidneys. A dietician can help in making a diet plan for you with right amounts of salt(sodium), fluids and protein.
3. Substances such as alcohol, tobacco or illegal drugs or drugs from Hakeem or quacks must not be used which can harm the kidneys.
4. Also , be sure that your doctor knows about all prescription medicines, OTCs and herbs you are taking.

Ethical Statement:-

Proper consent was taken from all the patients included in this study. Also there is no financial or other conflict of interest in this study.

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