RESEARCH ARTICLE

To Evaluate the Epidemiology, Etiology, Risk Factors and Treatment Management in Chronic Kidney Disease in Children, Adult and Geriatric Patients in a Tertiary Care Teaching Hospital in Nellore

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ABSTRACT

Chronic renal failure is a life-threatening disease to society. The study was conducted from October 2021 to June 2023 the study was done in the Nephrology inpatient ward, Vijaya Super Speciality Hospital, Pogathota Nellore, Andhra Pradesh. The study design is a cross-sectional for epidemiology and prospective observational study-1 for etiology, II-risk factors, III-treatment management. The sample size are 381 subjects in that children are 51 subjects, adult 171 subjects and geriatric are 159 subjects. The male are 199 volunteers and the female are 182 volunteers with chronic kidney disease (CKD). The result of this study was the epidemiology factor more in adults (45%) when compared to children (13%) and geriatrics (42%). In the sex parameters are less affected to females (48%) and males (52%) are more affected with chronic kidney disease. The etiology causes in children are glomerulonephritis, adults diabetes mellitus (DM) and geriatrics pyelonephritis these are the main causes for chronic renal disease when compared to other etiological causes. Risk factors in children are congenital defects, adult are diabetes mellitus and geriatric are kidney disease these are the risk factors to the renal failure patients. In treatment management, hemodialysis is the most effective treatment to adults when compared to children's and geriatric eng stage renal failure disease. The conclusion of this study initially may rectify causes and risk factors of the patients may not high prevalent in end-stage renal failure disease it not cause hemodialysis therapy and renal transplantation in children, adults and geriatric patients.

Keywords: Chronic renal failure disease, Hemodialysis, Adult, geriatric, Children epidemiology.

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INTRODUCTION

Chronic kidney disease (CKD) is a serious condition for world population in globally. In more of the countries, chronic renal disease is a high prevalent in many countries in world.[1,2] It is the 16th leading cause of year in life lost in globally.[3] CKD is widely acknowledged as a serious health issue. The CKD patients are growing rapidly because of management of complicated medical problems are expected in patients.[4] CKD is a non-communicable disease on 2008 in the world 57 million peoples died globally in which are 63% are the NCDs.[5] In US there estimated an annual report of chronic renal failure system in 2006 to 2012, it resulted as 6 to 135% of the population are affected with end-stage renal disease (ESRD).[6] Chronic kidney disease is classified as 5 stages. Prevalence of CKD was estimated glomerular filtration rate (GFR) on stages of CKD patients in stage 1 (3.5%), stage 2 (3.9%), stage 3 (7.6%), stage 4 (0.4%), and stage 5 (0.1%).[7] In stage 3 to 4 CKD the peoples are with CV disease lead an ESRD.[8]

The epidemiology factor of CKD in the year of 1990 to 2016 was increased a death rate is 90% because of mainly due to infections and cardiovascular diseases. In high-earning countries were annual healthcare cost are 2 to 3% and 0.03% of people are affected with end-stage renal failure.[9] The children are associated with ESRD effect by cardiovascular morbidity and mortality.[10] The ubiquity of renal failure and morbidity rate are depends on GFR categories 1 (G1) to 4 (G2) was 13.1 to 17.5% in adults in US and Thailand.[11] In chronic renal disease, geriatrics are more affected when compared to other groups like children and adults. The prevalence in elder patients of CKD is 39.4% with age of 60 years above.[12] From 2017 to 2019 the epidemiology factor of chronic renal failure disease patients are more prevalent to the geriatrics when compared to childrens and adults.[13] In 2021 the epidemiology factor of

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CKD are prevalence 11% and further the epidemiology factor are increases 12% by 2045. End-stage renal failure are the most prevalent to the geriatrics instead of childrens and adults.[14]

Etiological factor are associated cause for all the age group of the people with chronic renal failure. Especially the children's may presence of renal impairment their lifelong has focused on health system. The children's etiological factor may leads to an increase in morbidity and mortality rate in renal failure.[15] Hypertension and DM is a major cause for adult patients with CKD. These factors promote a renal failure in adult patients.[16] In US more of renal replacement therapy was seen in, especially in geriatrics. The category peoples are rapidly growing the stages in CKD. Where, increasing a treatment therapy like hemodialysis and increasing the prevalence in the early stage in renal disease.[17]

Renal failure is a serious health issue in the society. The 1.4 million renal patients are lead a kidney transplantation in the world. most of the people are caused with the risk factors are hypertension hyperlipidemia, hepatitis C virus, HIV, exposure to heavy metals, diabetes mellitus, acute kidney injury, metabolic syndrome, anemia, mineral and bone disorders etc,[18] Where children's are in end-stage renal disease are the 3.19 times are higher risk in CKD while for adults are having 10 to 16% of the population are affected with chronic renal disease with a prevalence of 15.7% of CKD.[19] In the geriatric population are affected 21.8% with the risk factor of diabetes mellitus it is one of the risk to become an end-stage renal failure disease.[20]

The treatment management in children, adults and geriatrics includes as in children mostly the treatment may give to related as normal growth so, there suggested a recombinant human growth hormone (GH) has been recommended to children with CKD. Where the GH dosages are given as 0.045 to 0.05 mg/kg per day on daily was given in the route of subcutaneous injection was given to the patient for better outcome.[21] For the adult population who are affected with increasing cardiovascular disease and diabetes mellitus initiate the treatment to prevent of complications or delay the kidney disease progression by estimating the GFR.[22] The government of CM provides some guidelines and developments to the group of consideration of older patients with CKD there are high comorbidity having a poor functional status to give a better treatment for geriatric people with no effect of adverse effects in their treatment.[23] Patients who got renal transplantation their need dialysis to improve their health but there are not flexible with their treatment because their emotionally weaker. The emotion is well tolerated the treatment will be flexible to chronic renal failure patients and it improves quality of life.[24]

Renal failure is common in all age group of peoples but there are not receiving better treatment because of their economic status, or socio-demographic condition these are the reflecting to the people who are in CKD condition so, the government provides the treatment to the CKD patients but the patients are need more support from the government for the renal transplantation. The government has to provide a health care funding, improve the primary health care systems and tolerating non-communicable disease patients and conduct programmes to get awareness about chronic kidney disease.[25-27]

MATERIALS AND METHODS

Site of the study is the Nephrology inpatient ward. Vijaya Super Specialty Hospital, Pogathota, Nellore. The study was conducted from October 2021 to June 2023. The sample size are 381 subjects in that children 51 subjects, adult 171 subjects and geriatric 159 subjects. The study design is a cross-sectional study for epidemiology study, prospective observational study-1 etiology, risk factors study-2 and treatment management-3. According to the inclusion-exclusion criteria the subjects are selected in the research study. The inclusion criteria are patients who are above 6 years old, children, adult and geriatric patients with CKD are included, patients with difference stages of CKD, who are accept informed and able to participate in study and patients with hemodialysis. Exclusion criteria such as patients who were non-co-operative, pregnant, lactating mothers and below 6 years old are excluded. Patient without CKD and who are not accept ICF.

Methods

- To get an approval of IEC
- Preparation of patient data collection form as proforma
- Preparation of informed consent form

The data has been collected upon 4 methods are patient demographics - cross sectional study, underlying etiological factors for developing CKD is the prospective observational study-1, risk factors in chronic kidney disease are prospective observational study 2 and pharmacological treatment pattern is a prospective observational study 3.

Table 1: Determination of epidemiology in CKD patients

S .No	*Study*	*Year*	*Age groups (In years)*	*No of patients*	*Epidemiology (%)*
1	Cross-sectional study	Oct 2021 to june 2023	Children's (6–14)	51	13
2			Adults (19–64)	171	45
3			Geriatrics (Above 65)	159	42
Total				381	100

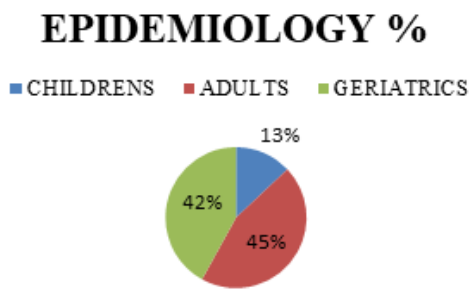

Figure 1: Frequency of epidemiology in CKD patients

Table 2: Determination of sex parameter in CKD patients

Sex	*No of patients with percentage*	
	No	*%*
Males	199	52
Females	182	48
Total	381	100

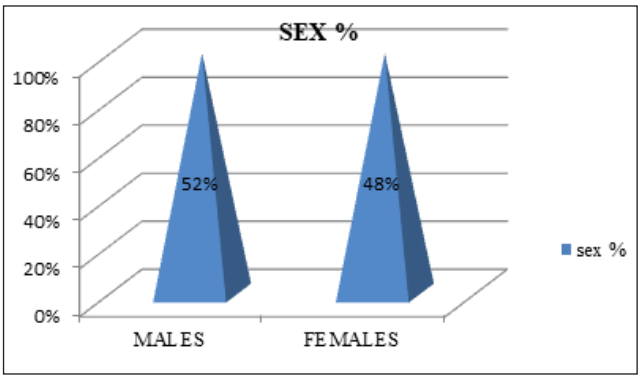

Figure 2: Frequency of sex in CKD patients

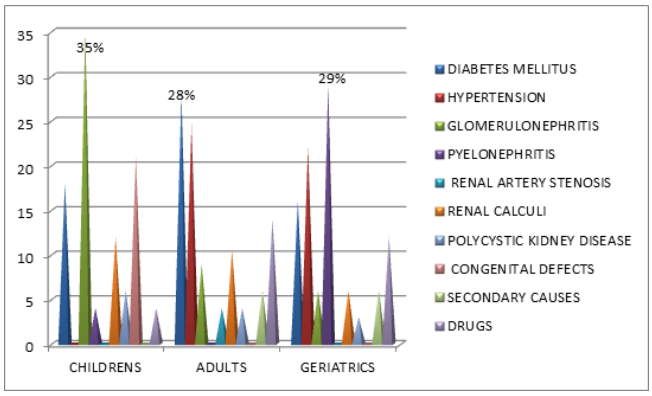

Figure 3: Frequency of etiological factors in CKD patients

Statistical Analysis

This study was utilized IBM SPSS statistics software in the version of 23.0. To describe the result by using the categorical variables, mean and depends on the percentage the graphs are designed etc.

RESULTS

The results determine the prevalence incidence and causes of CKD and pharmacological management in children, adult and geriatric populations on chronic kidney disease.

DISCUSSION

Chronic kidney disease are commonly occurring disease in the world. The result of this study about the prevalence factor and pharmacological treatment in children, adult and geriatric in CKD patients.

The epidemiology factor are evaluated from October 2021 to June 2023. The study are the cross sectional study and the age groups are the children, adult and geriatric in CKD patients. The determination of the epidemiology rate of this study are more prevalent to the adults (45%) when compared to children's (13%) and geriatrics (42%) in CKD are shown in Table 1. The frequency of the epidemiology on children, adults and geriatrics are shown below Figure 1.

The determination and frequency of sex parameters are in children, adult and geriatric chronic kidney patients are shown in Table 2 and Figure 2. It is more in male (52%) CKD patients when compared to female (48%) CKD patients

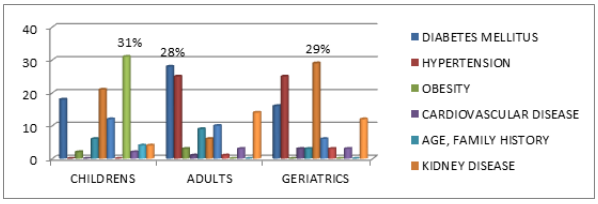

Figure 4: Frequency of risk factors in patients

Table 3: Determination of etiological factor in CKD patients

Study	*Causes*	*Year*	*No of patients with etiological factors %*					
			Childrens		*Adults*		*Geriatrics*	
			No	*%*	*No*	*%*	*No*	*%*
Prospective observational study -i	Diabetes mellitus	Oct 2021 to june 2023	9	18	48	28	26	16
	Hypertension		-	-	42	24.5	35	22
	Glomerulonephritis		18	35	15	9	9	6
	Pyelonehritis		2	4	-	-	46	29
	Renal artery stenosis		-	-	7	4	-	-
	Renal calculi		6	12	18	10.5	9	6%
	Polycystic kidney disease		3	6	7	4	6	3
	Congenital defects of the kidney or bladder		11	21	-	-	-	-
	Secondary causes (sle, rheumatoid arthritis, hiv, drugs- gold, heroin use etc.)		-	-	10	6	9	6
	Drugs (nsaids, aminoglycoside etc.)		2	4	24	14	19	12
Total			51	100	171	100	159	100

Table 4: Determination of risk factors in CKD patients

Study	*Risk factors*	*Year*	*No of patients with risk factors %*					
			Childrens		*Adults*		*Geriatrics*	
			No	*%*	*No*	*%*	*No*	*%*
Prospective observational Study -ii	Diabetes mellitus	Oct 2021 to june 2023	9	18	48	28	26	16
	Hypertension		-	-	42	25	39	25
	Obesity		1	2	5	3	-	-
	Age and race		-	-	2	1	6	3
	Family history of ckd		3	6	15	9	6	3
	Kidney diseases		11	21	10	6	46	29
	Kidney stones		6	12	18	10	9	6
	Malignancy acute kidney injury		-	-	2	1	4	3
	Congenital defects		16	31	-	-	-	-
	Autoimmune diseases		1	2	5	3	4	3
	Infections like hep c and hiv		2	4	-	-	-	-
	Nephrotoxics (nsaids, aminoglycoside etc)		2	4	24	14	19	12
Total			51	100	171	100	159	100

Table 5: Determination of treatment management in CKD patients

YEAR	*STUDY*	*Groups*	*Hemodialysis*	*Creatinine % (0.6-1.5 mg/dl)*				*BUN % (17-49 mg/dl)*			
				No	*Increasing %*	*No*	*Decreasing %*	*No*	*Increasing %*	*No*	*Decreasing %*
OCT 2021 to JUNE 2023	Prospective observational study –III	Childrens	51	27	53	24	47	26	51	25	49
		Adults	171	66	39	105	61	67	39	104	61
		Geriatrics	159	84	53	75	47	82	52	77	48
		Total	381								

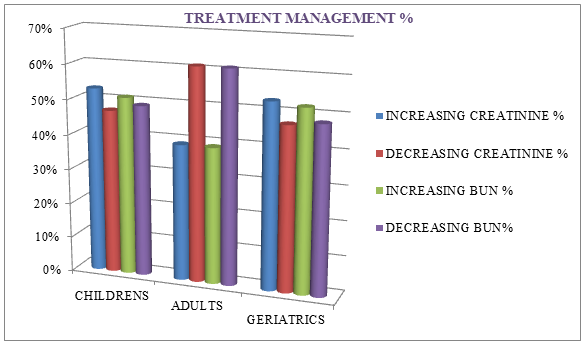

Figure 5: Frequency of treatment management for CKD patients

Etiology factors in renal failure disease patients are the children, adult and geriatric. This study was done from October 2021 to June 2023. The study design are the prospective observational study 1. The determination and frequency of the etiological factors shown in Table 3 and Figure 3 such as diabetes mellitus (18%), hypertension (0), glomerulonephritis (35%), pyelonephritis (4%), renal artery stenosis (0), renal calculi (12%), polycystic kidney disease (6%), congenital defects (21%), secondary causes (0), drugs (4%) in children's with CKD. When compared to other etiological cause glomerulonephritis are more effective cause to children. In adults the etiology percentage are diabetes mellitus (28%), hypertension (24.5%), glomerulonephritis (9%), pyelonephritis (0%), renal artery stenosis (4%), renal calculi (10.5%), polycystic kidney disease (4%), congenital defects of the kidney or bladder (0%), secondary causes (6%), drugs (14%) in adults with CKD. When compared to other etiological causes diabetes mellitus are more effective cause to adults. In geriatrics the etiology percentage such as diabetes mellitus (16%), hypertension (22%), glomerulonephritis (6%), pyelonephritis(29%), renal artery stenosis (0%), renal calculi (6%), polycystic kidney disease (3%), congenital defects of the kidney or bladder (0%), secondary causes (SLE, rheumatoid arthritis, HIV, drugs gold, heroin use etc.) (6%), drugs (12%) in geriatrics with CKD. When compared to other etiological causes pyelonephritis (29%) are more effective cause to geriatrics.

The determination and frequency of the risk factors in renal failure disease patients in children, adult and geriatrics. This study was done from October 2021 to June 2023. The study design are the prospective observational study 2. The risk factors are the diabetes mellitus (18%), hypertension (0%), obesity (2%), age and race (0%), family history of CKD (6%), kidney diseases (21%), kidney stones (12%), malignancy acute kidney injury (0%), congenital defects

(31%), autoimmune diseases (2%), infections like Hep C and HIV (4%), nephrotoxics (4%) in children's with CKD. When compared to other risk factors congenital defects (31%) are more effective risk to CKD children. In adults the risk factors are diabetes mellitus (28%), hypertension (25%), obesity (3%), age and race (1%), family history of CKD (9%), kidney diseases (6%), kidney stones (10%), malignancy acute kidney injury (1%), congenital defects (0%), autoimmune diseases (3%), infections like Hep C and HIV (0%), nephrotoxics (NSAIDS, Aminoglycoside etc) (14%) in adult CKD patients. When compared to other risk factors diabetes mellitus (28%) are more effective risk to CKD adults. In geriatric end-stage renal failure patients the risk factors are diabetes mellitus (16%), hypertension (25%), obesity (0%), age and race (3%), family history of CKD (3%), kidney diseases (29%), kidney stones (6%), malignancy acute kidney injury (3%), congenital defects (0%), autoimmune diseases (3%), infections like Hep C and HIV (0%), nephrotoxics (12%) in adult CKD patients. When compared to other risk factors kidney diseases (29%) are more effective risk to CKD adults as shown in Table 4 and Figure 4.

In treatment management, the physician has prescribed the drugs in chronic renal failure patients and also their given a dialysis method for renal failure patient to recover their health status of creatinine and BUN. The dialysis methods are 2 types there are peritoneal and hemodialysis. In this study, a hemodialysis treatment for the results. The treatment management was done from October 2021 to June 2023. The study design are the prospective observational study-3. The determination and frequency of treatment management on children, adult and geriatric end-stage renal failure patients was resulted by using creatinine and BUN values was shown in (Table 5 and Figure 5). The hemodialysis in children of increasing values of creatinine (53%) BUN (51%) and decreasing value of creatinine (47%) BUN (49%), adults are increasing values of creatinine (39%) BUN (39%) and decreasing value of creatinine (61%) BUN (61%) and geriatrics are increasing values of creatinine (53%) BUN (52%) and decreasing value of creatinine (47%) BUN (48%). The hemodialysis treatment is more effective in adults (increasing values of creatinine (39%) BUN (39%) and decreasing value of creatinine (61%) BUN (61%) when compared to children and geriatric CKD volunteers.

CONCLUSION

The most prevalent of chronic renal disease are in adults when compared to children's and geriatrics. The etiology factor in children are glomerulonephritis, adults are diabetes mellitus and geriatrics are pyelonephritis these causes are the main effective causes to all age groups of end stage renal failure volunteers when compared to other etiology factors. The risk factors in children are congenital defects, adult are diabetes mellitus and geriatric are kidney disease from these risk factors are more effective in all age group of chronic kidney disease patients when compared to other risk factors. In treatment management hemodialysis are more effective to adults when compared to children's and geriatric CKD subjects.

Hence, it can be concluded from the study the chronic are most prevalent because of the etiological and risk factors are lead to chronic renal failure disease in all age groups of volunteers. So, initially may reduce the causes of end-stage renal failure. Finally, in the end-stage renal disease the treatment management are more effective to the subjects to control the creatinine and BUN values.

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