2020-09

Pattern, Outcome and factors Associated with outcome of Renal Disease Among Hospitalized Children Beyond Neonatal Age at Tibebegion Specialized Hospital and Felegehiwot Comprehensive Specialized Hospital, Bahirdar, Ethiopia

Yenework, Tafere

BAHIR DAR UNIVERSITY

COLLEGE OF MEDICINE AND HEALTH SCIENCES

SCHOOL OF MEDICINE

DEPARTMENT OF PEDIATRICS AND CHILD HEALTH

PATTERN, OUTCOME AND FACTORS ASSOCIATED WITH OUTCOME OF RENAL DISEASE AMONG HOSPITALIZED CHILDREN BEYOND NEONATAL AGE AT TIBEBEGION SPECIALIZED HOSPITAL AND FELEGEHIWOT COMPREHENSIVE SPECIALIZED HOSPITAL, BAHIRDAR, ETHIOPIA

BY:

YENEWORK TAFERE(PEDIATRIC RESIDENT)

A THESIS REPORT TO BE SUBMITTED TO BAHIR DAR UNIVERSITY COLLEGE OF MEDICINE AND HEALTH SCIENCE DEPARTMENT OF PEDIATRICS AND CHILD HEALTH IN THE PARTIAL FULFILLMENT OF CERTIFICATE OF SPECIALTY IN PEDIATRICS AND CHILD HEALTH

SEPTEMBER,2020, BAHIRDAR, ETHIOPIA

BAHIR DAR UNIVERSITY

COLLEGE OF MEDICINE AND HEALTH SCIENCES

SCHOOL OF MEDICINE

DEPARTMENT OF PEDIATRICS AND CHILD HEALTH

NAME OF INVESTIGATOR	YENEWORK TAFERE; MD Email; tafereyenework4@gmail.com Cell phone ;0911072414
NAME OF ADVISORS	1. DR YALEMWORK ANTENEH(assit/professor) Email; Yalexanteneh@gmail.com Cell phone;0912660477 Signature;---------- 2. ZEMENU S.(MPH/RH) Email;zeds2010@yahoo.com Cell phone; 0910028125 Signature;----------
FULL TITLE OF THESIS	Pattern ,Outcome And Factors Associated With Outcome Of Renal Disease Among Hospitalized Children Beyond Neonatal Age At Tibebegion Specialized Hospital And Felegehowot Comprehensive Specialized Hospital,Bahirdar,Ethiopia
DURATION OF THE STUDY	FROM JANUARY1/2019 -AUGUST 30/2020
STUDY AREA	BAHIRDAR

Acknowledgment

I would like to acknowledge BDU, CMHS for providing me this golden opportunity to carry out this thesis development task as a partial fulfillment for my specialty program in pediatrics and child health. My thanks extend to Tibebegion specialized Hospital and Felegehiwot comprehensive specialized hospital staffs for their contribution to provide me all charts, logbooks and registers of patients that I need for my study.

I am grateful to express my thanks and appreciation to my advisors Dr Yalemwork Anteneh and Zemenu Shiferaw for their constructive comments and unreserved advices to complete this thesis.

Contents

Acknowledgment iii

Acronyms and Abbreviations vi

List of figures vii

List of tables vii

Abstract viii

1. Introduction 1

1.1 Background 1

1.2 Statement of problem 3

1.3 significance of the study 5

2. Literature review 6

2.1 Patterns of renal disease 6

2.2 clinical presentation and outcome of renal disease 7

2.3 socio-demographic factors 9

2.4 Conceptual frame work 11

3. Objective of study 12

3.1 General objective 12

3.2 Specific objective 12

4. Methodology 13

4.1 study area and period 13

4.2 Study design 14

4.3 population 14

4.3.1 source population 14

4.3.2 Study population 14

4.4 Inclusion and exclusion criteria 14

4.4.1 Eligible criteria 14

4.4.2 Exclusion criteria 14

4.5 Sampling technique 14

4.6 Data collection process 14

4.7.Variables of study 15

4.7.1 Independent factors 15
4.7.2 Dependent variable 15
4.8. Definitions 15
4.8.1 Standard definitions 15
4.8.2. Operational definitions 16
4.9 Data processing and analysis 16
5. Ethical consideration 17
6. Result Dissemination 17
7. Results 18
7.1. Socio-demographic characteristics of participants 18
7.2. Clinical profile of patients with renal disease 20
7.2.1. Causes of pediatric renal disease 20
7.2.2. Clinical features of pediatric renal disease 21
7.2.3. Complications,treatments, length of illness and hospital stay of pediatric renal patients 22
7.3. Treatment outcome of pediatric renal patients 24
7.4. Factors associated with outcome of pediatric patients with renal disease 26
8. Discussion 28
9. Limitation of the study 30
Conclusion 31
Recommendation 31
References 32
Annexes 34
Annex I: Checklists 34
Checklists 34
Annex II: Declaration 37

Acronyms and Abbreviations

ARF - acute renal failure

AKI – acute kidney disease

AGN - acute glomeluronephritis

APSGN - acute post streptococcal glomeluronephritis

CKD - chronic kidney disease

CAKUT - congenital anomaly of kidney and urinary tract

PUV - posterior urethral valve

ESRF - end stage renal disease

HSP – henoch shonlein purpura

KD - kidney disease

KDIGO - kidney disease improving global outcome

NICU - neonatal intensive care unit

NS - nephrotic syndrome

PICU - pediatric intensive care unit

SSA - sub-saharan Africa

TASH - tikur anbesa hospital

TGSH - tibebegion specialized hospital

UTI - urinary tract infection

FHCSH – felegehiwot comprehensive specialized hospital

List of figures

Figure 1: Conceptual framework of pattern, outcome and factors associated with outcome of renal disease among pediatric patients admitted at TGSH and FHCSH, Bahirdar, Ethiopia 2020

Figure 2; shows pattern of pediatric renal admission at TGSH and FHCSH from January 2019 to August 2020,Bahirdar,Ethiopia.

Figure 3:Pie chart showing cause of renal deaths among hospitalized children at FHCSH and TGSH from January 2019 to August 2020,Bahirdar ,Ethiopia.

List of tables

Table 1: Socio demographic characteristics of pediatric patients with renal disease admitted at TGSH and FHCSH, from January 2019 to August 2020.

Table2 : Causes of renal disease among pediatric renal patients admitted at TGSH and FHCSH, from January 2019 to August 2020.

Table 3: Clinical features of patients with renal diseases at TGSH and FHCSH, from January 2019 to August 2020.

Table 4: Ultrasound result of pediatric renal patients admitted at TGSH and FHCSH from January 2019 to August 2020

Table 5: Complications , treatments, length of illness and hospital stay among pediatric patients with renal disease admitted at TGSH and FHCSH, from January 2019 to August 2020.

Table 6: Treatment outcome of pediatric renal patients admitted at TGSH and FHCSH from January 2019 to August 2020.

Table 7: chi-squared test showing treatment outcome of pediatric renal patients admitted at TGSH and FHCSH from January 2019 to August 2020.

Abstract

Background: Renal diseases are major causes of morbidity and mortality in hospitalized pediatric patients. More than half of patients with advanced kidney disease do not receive any treatment, especially in the low and low middle income countries. The patterns of renal disease in children are different in developing countries as compared to developed countries and pediatric renal diseases contribute about 3.5-8.9% of total pediatric admissions. Data on the spectrum of renal disorders in African children are scanty especially in Bahirdar.

Objective: The objective of this study was assessing pattern, outcome and associated factors of renal disease among pediatrics renal patients in hospitalized children beyond neonatal age at TGSH and FHCSH from January 1/2019 to August 30/2020

Methods: Institution based cross sectional study was conducted over 19 months in 107 patients who fulfilled the eligibility criteria from TGSH and FHCSH. Data collected by checklist was entered, cleaned and analyzed by SPSS statistical software version 23. Descriptive and summary statistics was carried out. Chi-squared test was used to assess the association between dependent and independent variable.

Result. From a total of 107 renal patients 55.1% were males and most patients are from rural areas (83.2%) and from FHCSH (56.1%). The majority of patients are in age 5-10 years (46.7%). Glomeluronephritis was the most common causes of renal admission (59.8%) and 40% of these patients had renal failure. Most patients (87.98%) discharged improved including referrals and 12.1% of patients died because of multi-organ failure and sepsis. Twenty five patients (23.4%) needs renal replacement therapy and no patient received this therapy including the deaths. AKI, CKD, complications (sepsis,multi-organ failure)hospital stay >2weeks, electrolyte abnormalities ,decreased UOP ,seizure or decreased mentation had associations with outcome of patients with renal disease.

Conclusion: From a total of 107 renal patients most patients were from rural areas and males. Glomeluronephritis was the most common causes of renal admissions. Most patients were discharged improved including referrals. Sepsis and multi-organ failure are the most common cause of death. The presence of complications (sepsis, multi-organ failure), hospital stay

>2weeks,electrolyte abnormality, seizure or decreased mentation had associations with outcome of patients with renal disease.

Key words: pattern, outcome, associated factors, renal disease, pediatrics, Bahirdar

1. Introduction

1.1 Background

Pediatric nephrology is very challenging and is not a priority in developing countries in contrary to developed ones. The burden of kidney disease in children in most developing countries including Sub-Saharan Africa (SSA) is unknown and difficult to estimate due to lack of data on pediatric kidney disease and absence of renal registries in general. Few hospital based studies exist and the reported pattern of renal disease in pediatric population is variable.

In developing countries the major causes of chronic kidney disease(CKD) in children are chronic glomerulonephritis, urologic malformations (posterior urethral valves) and CKD of unknown etiology, while for AKI septicemia, diarrhea, malaria, and hemolytic uremic syndrome are the most frequent causes(1)

Several studies have demonstrated the increased rate of renal disease in American Indians and native Americans due to both diabetic and none diabetic individuals. so in the developed countries the causes of renal disease predominantly due to chronic medical illness mainly diabetic nephropathy (>53%) and among none diabetic individuals abnormal albumin excretion, glomerulonephritis due to IGA nephropathy(2).

In a study from Dhaka city Nephrotic Syndrome was the most common cause of inpatient as well as outpatient cases of renal disease followed by chronic kidney disease followed by first episode UTI and the most common clinical presentations were proteinuria (27.6%),oliguria or anuria (26.2%) and edema (25.7%)(3).

The pattern of renal disease also varies in African countries and the most common causes of renal problem in Libya is AGN where as in Dubai and Nepal NS ranked the highest(5).

The percentage of renal-related admissions to secondary and tertiary hospitals in developing countries varies widely from 3.5 to 8.9% among diff erent centers and countries. The most common cause of admission is in south Africa is AKI due to dehydration and septic shock syndromes. This has improved owing to the introduction of

oral rehydration , but many rural areas still do not have easy access to clean water and sanitation. The spectrum of chronic glomerular diseases varies in the different geographical regions of the continent, with the epidemiology of infectious agents implicated in its causation(4)

Common causes of renal diseases in Nigeria include acute glomerulonephritis (AGN), nephrotic syndrome (NS), acute kidney injury (AKI), congenital anomalies of the kidney and the urinary tract (CAKUT), chronic kidney diseases (CKDs)and renal malignancies, with varying rates. The variations in the patterns of renal diseases amongst the pediatric population are related to differences in genetic predisposition, environmental risk factors for renal diseases, definitions of renal pathologies, clinical and laboratory capacities to diagnose renal diseases, methodological variations relating to the type of study (retrospective or prospective), duration of the study and sample size(5).

The spectrum of kidney disease in children ranges from treatable disorders without long-term sequelae to life-threatening conditions. Children with acute kidney injury may develop long-term consequences leading to chronic kidney disease later in life. Worldwide epidemiological information on the incidence and prevalence of pediatric AKI and CKD is limited, often imprecise, and flawed by methodological differences between the various data sources, although increasing in scope. This is particularly pertinent in Africa, where the focus is on communicable diseases with lack of proper documentation and renal registries(6).

Pediatric patients with renal disease, especially younger one may present with nonspecific signs and symptom unrelated to the urinary tract. Pediatricians therefore should be familiar with the modes of presentation of renal disease and should have a high index of suspicion of these conditions. Kidney disease often goes undetected in the general population, but children and adolescents are at an even greater risk due to the nature of the causes of the disease and the ambiguity of the symptoms(7).

Early diagnosis and management are the cornerstone of renal disorders management to stall further progress to renal complications, such as chronic kidney disease (CKD) and end-stage renal failure (ESRF). It is worthwhile to note that a majority of renal disorders

in children result from preventable causes such as urinary tract infection (UTI) with the good outcome when the patient present early before the onset of end-stage renal disease requiring permanent renal replacement therapy(8).

1.2 Statement of problem

Data on the spectrum of renal disorders in African children are scanty, but many recent studies suggest that renal diseases are common and the incidence may be rising(9). There are virtually not sufficient published reports on the pattern, magnitude, outcome of patients with renal disease in Ethiopia. So it makes difficult to plan substantial public health programs that can help to the development and implementation of more effective intervention programs(10).

The pattern and burden of childhood renal diseases, outcomes and associated factors has not been studied in our hospital.

Renal disease in children is common with increase prevalence of chronic kidney disease (CKD) globally and an annual incidence rate of 8%. In addition acute renal failure is common in children admitted to hospitals, with a pooled incidence estimated at 33.7% . These increase in prevalence is mainly reflected by epidemiology of infectious disease(1, 11).

According with the research done in India 2018 the spectrum of infection induced kidney diseases is diverse and infections manifest in the form of several renal clinical syndromes. Acute kidney injury, acute and chronic glomerulonephritis syndrome, nephrotic syndrome, acute nephritic-nephrotic syndrome, acute or chronic tubullar interstitial nephritis, and rapidly progressive glomerulonephritis. Glomerulonephritis of various etiologies are the most common cause of ESKD in developing countries is the leading cause in rural areas as well in urban areas (12)

In one study done in Pakistan to show the histological pattern of renal disease in children the commonest indications were nephrotic syndrome ,nephritic/ nephrotic syndrome with renal insufficency, steroid resistance nephrotic syndrome(13).

Childhood renal diseases are common causes of morbidity and mortality and studies from different parts of Nigeria and the world have reported variable patterns of renal diseases in childhood. Morbidities of importance noted by these researchers included urinary tract infection (UTI), acute glomerulonephritis (AGN), acute kidney injury (AKI) from varying causes, nephrotic syndrome, congenital urinary tract obstructions and malignancies, with varying rates(14).

According to Sudanese journal of renal disease and kidney transplantation 2014,Kidney diseases accounted for 8.9% of pediatric admissions. Nephrotic syndrome, acute kidney injury and nephroblastoma accounted for almost 70% of admissions. The overall mortality was 14.4% with acute kidney injury accounting for 36% of this. Chronic kidney disease was also associated with poor outcome.(15)

There are national and regional differences in the types and course of kidney disease during childhood and beyond. The death rate from kidney disease is higher in developing nations and national and regional disparities in care and outcome must be addressed. Further access to care is variable depending on the region, the country, and its infrastructure. By focusing on kidney disease in childhood, cost-effective solutions may be reached, as treating disease early and preemptively may prevent later more advanced CKD(16).

In our countries there is only one hospital based studies done in TASH, AA and in our setup at Bahirdar there is no evidence that shows pattern of renal disease and the hospital outcome of pediatrics renal disease. Hence this study was conducted to determine the pattern of renal disease and hospital outcomes with its associated factors at Tibebegion specialized hospital and felegehiwot comprehensive specialized hospital, Bahirdar.

1.3 significance of the study

Renal failure are now one the major of public health concerns with significant morbidity and mortality even in well developed countries because of high cost of the disease& chronic morbid illnesses while the majority of problems in developing countries are preventable because of epidemiology of infectious disease.

There are only limited studies in our countries particularly in Bahirdar there is no study which shows the pattern, outcome and associated factors of pediatric renal disease, there for this study was conducted to determine the pattern of pediatric renal disease and at TGSH and FHCSH, Bahidar. The study also highlights the symptoms and signs of renal diseases, outcomes of treatment with its associated factors in children at TGSH and FHCSH.

Lack of advanced diagnostic and treatment facilities in many of our hospitals often leads to inaccurate diagnosis and suboptimal treatments. These factors eventually lead to progression of renal disorders to end stage renal failure (ESRF).

So these research will give information for different stake holders including hospital managerials, regional health bureau to know the burden of renal disease in children and to establish pediatric renal treatment center including pediatric dialysis center.

It can serve as an input for local health planning and programing. It will facilitate training of different staffs including pediatrics nephrologists.

The finding of this study will also serve as a baseline for further advanced research for whom to conduct a large community based study .

2. Literature review

kidney disease is a substantial worldwide clinical as well as public health problems. chronic kidney disease and AKI which are the most concerning complications of kidney disease are linked to high health care costs, poor quality of life, and serious adverse health outcomes (including cardiovascular disease, kidney failure requiring kidney replacement therapy, infection, depression, and mortality(11).

Worldwide epidemiologic data on the spectrum of kidney disease in children are currently limited, though are increasing in scope. The World Health Organization (WHO) has recently added kidney and urologic disease to mortality information tracked worldwide, AKI may lead to CKD according to selected adult population studies. The outcome depends on the available resources. Single-center studies as well as meta-analyses indicates that both AKI and CKD in children account for a minority of CKD worldwide. However it is increasingly evident that kidney disease in adulthood often springs from a childhood legacy(16)

2.1 Patterns of renal disease

Published studies on the epidemiology of renal diseases in children in Latin American countries shows ,a wide spectrum of renal conditions affects children in Venezuela; however the majority of cases fall into three major categories: (1) UTI (2) metabolic disorders(hypercalciuria and hyperuricosuria and (3) glomerulopathies together all accounts 70% of all pediatric nephrology patients. The other 30% corresponded to urolithiasis(7%) renal tubular acidosis(5.6%) nephrotic syndrome(8.5%) primary hematuria(4.2%) acute renal failure(2.8%) chronic renal failure(1.6%) and miscellaneous diseases 4.8%(17).

A retrospective review of standard medical records of all Children hospitalized in the pediatric ward of the Dr.Wahidin Sudirohusodo Hospital Makassar, Idonesia over a period of five years renal diseases accounting for 16.5% of all pediatric admissions. Age of the patients ranged from 10 months to 16.7 years, with a boy to girl ratio of 1.2:1, the commonest pediatric renal diseases in this hospital was APSGN (27.6%), followed by NS (25.2%), UTI (19.1%)(18).

A retrospective study from 130 children admitted to Gaziantep university nephrology unit, Turky over period of four years. The pattern of pediatric renal admissions gradually increases from 3% to 69%,includes NS (18.5%), CAKUT (26.2%), urolitiasis (6.9%), CKD (23.1%) , AKI (3.1%), glomerulonephritis(3.8%) enurosis (9.2%) others(9.2%) (19).

A study done at Nepal over a period of one year with a total of 206 patients Renal diseases accounted (6.9%) of total annual pediatric admissions of which (58%) were male and (42%) female. AGN was the most common disorder (37.7%) followed by nephrotic syndrome (26.1%), urinary tract infection (21.3%), AKI (17.9%), obstructive uropathy (1.9%), CKD (1.2%) and others(20).

A retrospective study over a period of 3 years, at TASH, Ethiopia, shows Out of 14521 admissions kidney diseases accounted for 473 admissions in 381 children accounting for 3.3% of all admissions. The three most common renal diseases were (CAKUT) (26.8%), followed by NS(16.9%)and AGN (12.2%). Other renal diseases were UTI (8.0%), urolithiasis (6.7%), Wilm's tumor (6.3%), AKI (4.2%)and chronic kidney disease(4.0%) Other less frequently detected diseases were bladder extrophy, lupus nephritis, HSP nephritis and prune-belly syndrome(7).

Studies from different geographical areas around the world have reported variable patterns of renal diseases in pediatrics population. These variations could be related to genetic predisposition, environmental factors or lack of awareness about importance of early diagnosis of such disorders(21).

2.2 clinical presentation and outcome of renal disease

Acute renal failure is a frequent complication of critical illness and carries a significant risk of short‐ and long‐ term mortality. Different studies shows the presence of acute kidney injury of any renal or none renal causes is including chronic kidney disease and cardiovascular events. The degree of renal recovery from AKI may substantially affect these long‐ term endpoints(22).

A retrospective study done in Gusau,Zamfara state,Nigeria over a period of 30 months, shows renal diseases accounts 3.2% of total admissions with male:female ratio was

1.19:1. UTI (34%), AGN (24%) and AKI (20%),NS(11%),CKD(9%), Shistosomiasis (1%) were the the most common diagnoses. The commonest presentations are Fever (63%), reduction in urine volume/frequency (46%), body swelling (43%) and abdominal pain (40%) , Hypertension (33%) and heart failure (17%). The outcomes were (84%) children were discharged improved, (67%) had normal renal function, and (17%) had residual renal function, i.e. were still on dialysis or still had deranged urea or creatinine, Seven (10%) children died, while 4 (6%) children's caregivers signed against medical advice and left the hospital. The children that died included 4 (57%) with AGN, 2 (29%) with AKI, and 1(14%) with CKD of which 4 (57%) were males and 3 (43%) were females(14).

In a study from Nepal the commonest presentations of renal disease were edema (78.2%) , fever (57.3%), hypertension(53.4%) and proteinuria in 73.3% of the cases. Renal function test showed high urea (43.2%) and creatinine (46.3). of the total cases (93%) improved,5% expired, and about 2% cases required referral for surgical intervention and further treatment to higher nephrology centers. The non-survivors had AKI and mostly due to sepsis causing multi-organ dysfunction syndrome(20).

Another retrospective observational study on federal teaching hospital of Abakaliki ,Nigeria over a period of three years was carried out giving a prevalence rate of renal disease 4.4%. The major renal disorders included nephrotic syndrome 32.9% ,infective renal disorders (UTIs/pyelonephritis) – 26.6%, AGN (10.1%) . The outcomes of the study were 72.2% recovered and were discharged home to be followed up regularly,13.9% were referred out to other tertiary hospitals mostly due to the lack of proper equipment for treatment as well as on parental request, 10% left against medical advice, while 3 died giving a case fatality rate of 3.8%.(8).

A study done in Tikur anbesa hospital, Ethiopia out of 381 children 207 (54.3%) recovered normal renal function, 20(5.2%) remained with proteinuria, 13(3.4%) progressed to chronic kidney disease and 11(2.9%) died. Sixty one nephrotic children (76.3%) achieved remission but 17 children (21.3%) remained with proteinuria; one steroid resistant child died of end stage renal disease. Ten children (2.6%) with different

renal diseases were lost to follow-up and 5 (1.3%) discharged against medical advice. The most common presenting features of renal diseases were edema and proteinuria(7).

2.3 socio-demographic factors

It is important to acknowledge the complexity of measuring socioeconomic status when discussing health disparities .Mechanisms linking low birth weight with conditions predisposing to CKD, including hypertension, diabetes mellitus, dyslipidemia and obesity, as well as directly to micro albuminuria and decreased eGFR(23).

kidney disease both acute and chronic are recognized as major public health issues worldwide. More than half of patients with advanced chronic kidney disease do not receive any treatment, especially in the low and low middle income countries. AKI contributes to about 1.7 million preventable deaths every year worldwide(24).

In a study from Aminu Kana hospital, Nigeria a total of 244 new patients were seen at the pediatric nephrology clinic over the 30‑ month period. The male to female ratio of 1.7:1. The ages ranged between two months and 179 months with a mean age of 104.8 ± 46.7 months. Most patients (45%) were aged 120‑ ‑ 179 months ,with statistically significant (9).

A study from Bangladish over a period of one year ~1123 renal patients need admissions ,among them 722 were male and 401 were female, with a male to female ratio of 1.8:1,mean age was 5.84±3.55 years and most common age group was 0-5 yrs (53.5%), followed by 6-10 yrs (33.1%). Nephrotic syndrome is the most common disease followed by chronic kidney disease and urinary tract infection. Obstructive uropathy is the commonest etiology of CKD. It has been found that boys were presented more commonly than girls in this study. Most common presenting features were proteinuria, oligouria and edema(3).

Another study from teritiary hospital(Abakaliki), Nigeria in over a period of three years ~ 1780 children were admitted, of which 79 had renal disorders, giving a prevalence rate of 4.4% . male :female ratio of 1.6:1.0 , Although ,poverty and place of residence (rural) were important factors that have supported the development of renal disease among the patients, its association with the outcome of treatment was however not found to be

statistically significant. The association between treatment mode and outcome of the treatment was statistically significant. whereas other variables, such as age, sex, socioeconomic status and type of renal disease were not statistically significant(8).

In a study from Tikur anbesa, there was a significant correlation between the pattern of renal disease and the age of presentation 60% of CAKUT and 65% of glomerular diseases presented in under five and five to ten years of age respectively. However, there was no significant correlation between the pattern of diseases and gender(7).

2.4 Conceptual frame work

This is the conceptual framework of outcome (discharge, death) and associated factors (socio-demographic factors, causes of renal disease, presence of complications, clinical presentation, type of treatment and need for renal replacement therapy) of pediatric renal patients admitted at TGSH and FHCSH from January 2019 to August 2020, Bahirdar.

The conceptual framework were developed by the principal investigator after revising different literatures.

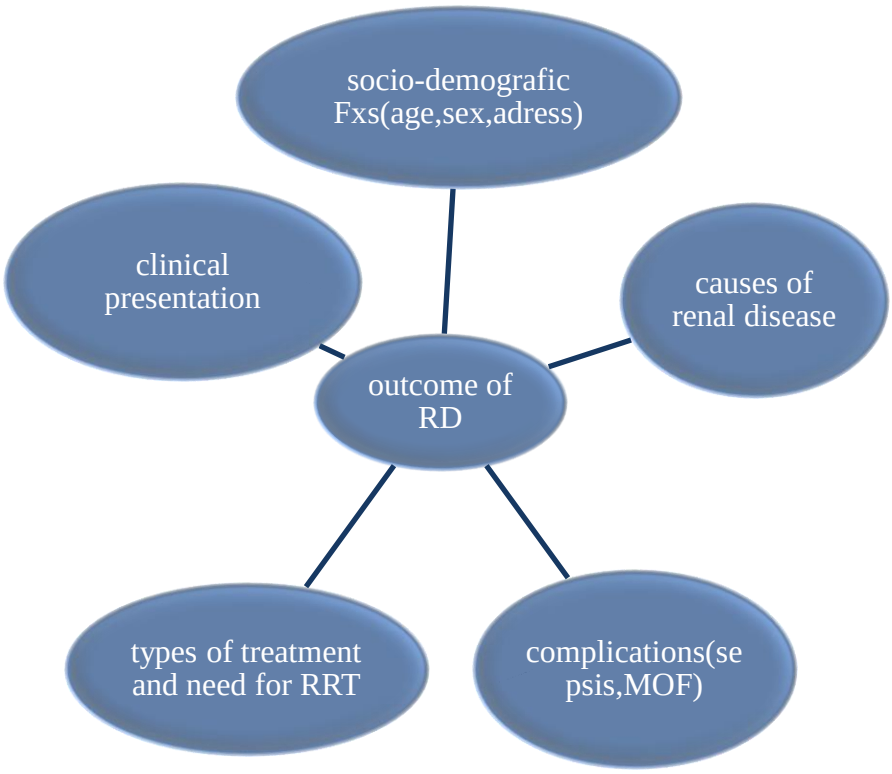

Figure1; Conceptual framework of outcome and associated factors of pediatric renal patients admitted at TGSH and FHCSH from January 2019 to August 2020,Bahidar,Ethiopia

3. Objective of study

3.1 General objective

- To assess pattern, outcome and associated factors of pediatrics renal disease in hospitalized children beyond neonatal age at TGSH and FHCSH from January 1/2019 to August 30/2020.

3.2 Specific objective

- To assess pattern of renal disease in hospitalized children at TGSH and FHCSH
- To assess outcome renal disease in hospitalized children at TGSH and FHCSH
- To assess factors associated with pediatrics renal disease hospitalized at TGSH and FHCSH

4. Methodology

4.1 study area and period

The study was conducted at Tibebegihion Specialized Hospital and Felegehiwot Comprehensive Specialized Hospital from January 1/2019 to August 30/ 2020.

TGSH is one of the teaching hospitals in Ethiopia found in Bahir Dar city. Bahirdar is the capital city of Amhara national regional state and is located at 565 km in North West of Addis Ababa. Pediatrics department at TGSH was established on January 1, 2019 EC. It has both inpatient and outpatient units. There are 5 inpatient units which includes critical ward ,stable ward , NICU ,PICU ,maternal side of which the study is conducted on the three major sides other than NICU & maternal side . There are 9 senior pediatrician and one subspecialist cardiologist, 32 residents are currently attaching to pediatrics department,19 Nurses are at the inpatient side, all of them are BSC degree and from which one had special training . At critical and stable ward there are 54 beds,. There is also PICU which was established on September/2019 ,at PICU there are 2 beds with one mechanical ventilator &the number of nurses are 4. There is no dialysis and renal transplantation service in the hospital.

Felegehiwot comprehensive specialized hospital is also found in Bahirdar. FHCSH has four major departments which are Internal medicine, surgery, obstetrics &gynecology and pediatric ward. It also has minor departments including ophthalmology, ear nose throat (ENT), psychiatry, dermatology, and radiology. Pediatrics and child health, which is one of the major departments, has both outpatient (OPD) and inpatient units.The OPD includes the emergency room (ETAT), comprised of two beds in triage and 6 beds for stabilization before admission to inpatient. There are two rooms for cold patients (non urgent) and one room for chronic follow up. The annual patient flow at pediatric OPD is about 6612. The pediatric ward has a total of 52 beds of which 18 beds are reserved for critical admission. Miscellaneous cases and patients with severe acute malnutrition occupy the remaining 18 and 15 beds respectively. And 3 beds are preserved at isolation room. The hospital has adult ICU and adult dialysis service but there is no pediatric ICU and pediatric dialysis and renal transplantation center.

4.2 Study design

Hospital based cross sectional study was conducted from January 1 - /2019 to August 30/2020.

4.3 population

4.3.1 source population

All admitted patients with renal disease at TGSH and FHCSH from January 1/2019 to August 30/2020 were the source population.

4.3.2 Study population

All admitted patients with the diagnosis of renal disease from January1/2019 to August 30/2020 and those who will fulfill the eligibility criteria were the study populations.

4.4 Inclusion and exclusion criteria

4.4.1 Eligible criteria

All pediatrics patients admitted with renal disease aged 1 month to 14 years at TGSH and FHCSH from January1/ 2019 to August 30/2020 over a 19 months were eligible for this study.

4.4.2 Exclusion criteria

Patients with incomplete documentation and laboratory results were excluded from the study

4.5 Sampling technique

Since TGSH is established recently (on January 2019) and the logbook of pediatric patients attending FHCSH before January 2019 were lost and the number of patients with renal disease were small (107), so all cases with the diagnosis of renal disease during the study period were the study participants.

4.6 Data collection process

Data were collected at TGSH and FHCSH from medical records (log book and patient charts) of patients admitted at pediatric ward and PICU for in patient management from January 1/2019 to August 30/2020 . Data were collected by principal investigator and

four trained medical interns .There was daily supervision how the data were collected and its completeness by the principal investigator. A structured check list which contains demographic data of the children with renal disease, causes and major outcomes of renal disease were used to collect the data. Because data collectors were health professionals experienced with the study variables, there was no need to translate the check list to Amharic language. The checklist was pre tested before the actual data collection was started.

4.7.Variables of study

4.7.1 Independent factors

- ✓ Socio demographic factors (age, sex, address,)
- ✓ Presence of complications(sepsis, MOF)
- ✓ Causes of renal disease
- ✓ Clinical presentation
- ✓ Type of treatments and need of renal replacement

4.7.2 Dependent variable

Patient outcome (discharge ,death)

4.8. Definitions

4.8.1 Standard definitions

Renal disease; any disease which affects renal system structurally or functionally, can be renal or extra renal cause.

Acute renal failure: impaired renal function in less than 3 months as defined by PRFILs criteria

Chronic renal failure : decreased renal function which stays more than 3months defined by eGFR <60ml/m2

Beyond neonatal age: age >28 days

Improved: discharged without complication

Complication; the presence of renal failure ,multi-organ dysfunction i.e (pulmonary edema ,heart failure, uremia), electrolyte abnormalities, sepsis**.**

Urinary symptoms: (dysuria,frequency,urgency)

4.8.2. Operational definitions

Outcome: final outcome of patients diagnosed to have renal disease (discharge or death)
Discharge: includes (discharge improved, discharge against, referred for dialysis or transplantation , surgical intervention and further workup).

Associated symptoms: (fever, vomiting, diarrhea)

4.9 Data processing and analysis

Data collected by checklist was entered, cleaned and analyzed using SPSS statistical software version 23. Data was cleaned by running frequencies of all the variables to check for incorrect coding and missing values. Descriptive and summary statistics was carried out. Because of small sample size it was not possible to get the real associations of the dependent and the independent variables with bivariate and multivariate analysis with even the assumptions of $p<0.2$ was significant and variables undergone analysis. So Chi square test was carried out to assess the association between independent and dependent variables (outcomes of renal disease).

5. Ethical consideration

Ethical clearance was obtained from the human Research and Ethical Review committee of Bahirdar University. Confidentiality of information obtained from patients documentation will be maintained, secured and it will never used for other purpose.

6. Result Dissemination

The study findings of the study will be submitted to Bahirdar University college of medicine and health science. It will be disseminated and communicated to relevant bodies like department of pediatrics and child health, TGSH, FHCSH, regional health bureau, and all governmental and nongovernmental organizations working in community health and health related problems in the form of written document.

7. Results

7.1. Socio-demographic characteristics of participants

From a total of 135 admitted patients 107 patents fulfills the eligibility criteria. Twenty eight charts were excluded because of incompleteness.

From a total of 107 renal patients admitted to the wards 59 were males (55.1%) and 48 females (44.9%) giving a male to female ratio of 1.2:1. The age of patients ranges from 46 days to 14 years. From a total of 107 patients 46.7% of the patients were between 5-10 years, 30.8% below 5 year of age and 22.4% were above 11-14 years of age. Most of the patients were from rural area 89(83.2%) and from Felegehiwot Comprehensive Specialized Hospital 60(56.1%). (Table 1).

Table1: Socio demographic characteristics of pediatric renal patients admitted at TGSH and FHCSH from January 2019 to August 2020 (N=107), Bahirdar, Ethiopia.

Variables		Frequency(n)	Percentage (%)
Sex	Female	48	44.9
	Male	59	55.1
Age	<5yrs	24	22.4
	5-10yrs	50	46.7
	11-14yrs	33	30.8
Address	Rural	89	83.2
	Urban	18	16.8
Hospital	TGSH	47	43.9
	FHCSH	60	56.1

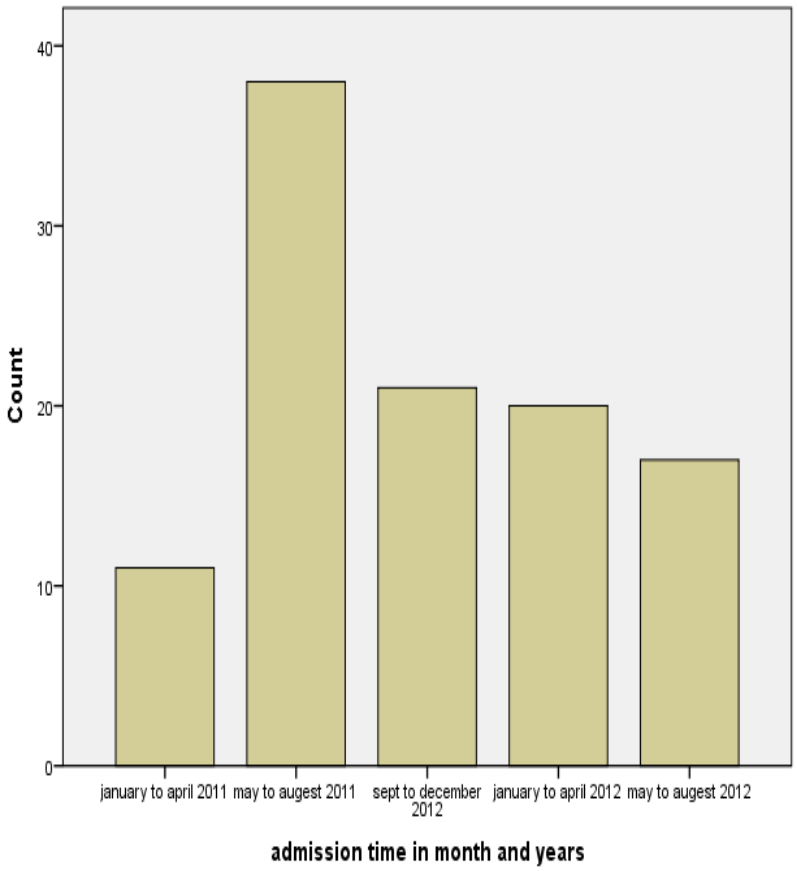

Figure 2; shows pattern of pediatric renal admission at TGSH and FHCSH from January 2019 to August 2020, Bahirdar, Ethiopia.

7.2. Clinical profile of patients with renal disease

7.2.1. Causes of pediatric renal disease

Out of 107 patients with renal disease glomeluronephritis accounts 64(59.8%) of patients and 19(30%) patients had evidence of acute post streptococcal glomeluronephritis and 25(40%) of patients had renal failure. The 2nd most common renal diagnosis is nephrotic syndrome 9(8.4%).The majority of patients 8(95%) had proteinuria and edema. The 3rd most common renal disease is CAKUT 7(6.5%) of which posterior urethral valve was the commonest accounting 3(49%) of the CAKUT. CKD accounts also the 3rd causes of renal disease 7(6.5%) and the most common causes were chronic glomeluronephritis 3(49%) four of CKD patients was dead because of multi-organ failure and sepsis.

AKI is also responsible for 6 (5.6%) and the most common causes were rapidly progressive glomeluronephritis 4(67%) and 5 of the AKI patients referred for dialysis and one patient with HUS dead because of multi-organ failure. Other causes of renal disease accounts 14(13.1%) of which UTI accounts 6(43%) of cases. Others were sepsis(4), HUS(1), HSP nephritis(1), wilms tumor(2).Table(2).

Table 2: Causes of renal disease among pediatric renal patients admitted at TGSH and FHCSH from January 2019 to August 2020 (N=107), Bahirdar Ethiopia.

Variable	Frequency(N)	Percentage (%)
Glomeluronephritis	64	59.8
Nephrotic syndrome	9	8.4
CAKUT	7	6.5
CKD	7	6.5
AKI	6	5.6
Others	14	13.1
Total	107	100.0

7.2.2. Clinical features of pediatric renal disease

Proteinuria were the most common clinical presentation of patients with renal disease 91(85%) of the cases followed by edema 84(78.5%) of the cases, decreased UOP 65(60.7%) of the cases, hematuria 64(59.8%) of the cases, elevated renal function 54 (49.5%) of the cases.Table (3).

From 107 patients 44(41.1%) had abnormal ultrasound result and the most common abnormality were parenchymal renal disease 32(29.9%). Table(4).

Table 3: Clinical feature of pediatric renal patients admitted at TGSH and FHCSH from January 2019 to August 2020 (N=107), Bahirdar, Ethiopia.

Clinical features	**Responses**		
	N	percent	Percent of cases
Proteinuria	91	16.7%	85%
Edema	84	15.4%	78.5%
Decreased UOP	65	11.9%	60.7%
Hematuria	64	11.7%	59.8%
Elevated renal function	54	9.9%	50.5%
HTN	53	9.7%	49.5%
Associated symptoms	52	9.5%	48.6%
Body rash	32	5.9%	29.9%
Urinary symptoms	19	3.5%	17.8%
Elevated ASO	19	3.5%	17.8%
Seizure, decreased mentation	13	2.4%	12.1%
Total	546	100.0%	510.3%

Table 4: Ultrasound result of pediatric renal patients admitted at TGSH and FHCSH from January 2019 to August 2020(N=107) ,Bahirdar, Ethiopia.

variables		Responses	
		N	percentages
Ultrasound result	Normal	63	58.9%
	Parenchymal disease	32	29.9%
	Anatomic abnormality; PUV	3	2.8%
	PUJ obstruction	1	0.9%
	Ectopic kidney	1	0.9%
	Multi -cystic dysplastic kidney	1	0.9%
	Decreased kidney size	6	5.6%
Total		107	100.0

7.2.3. Complications,treatments, length of illness and hospital stay of pediatric renal patients

Renal failure were the most common complication of renal disease 54(89.5%) of cases followed by electrolyte abnormality 20(32.8%). Sepsis, heart failure, uremia, multi-organ failure and pulmonary edema were the other complications. From 107 patients 79(73.8%) improved and discharged with medical treatment only and 25(23.4%) patients required dialysis and renal transplantation in addition to medical treatments and none of patients received this treatment and 3(2.8%) of patients required surgical interventions. Sixty five patients(60.7%) stays less than one week in the hospital. fifty one (47.7%) of patients had duration of illness less than one week. Table (5).

Table 5: Complications,treatments, length of illness and hospital stay for pediatric renal patients admitted at TGSH and FHCSH from January 2019 to August 2020(N=107), Bahirdar ,Ethiopia.

Variables		Responses		Percent of cases
		N	percent	
Complications	Renal failure	54	39.4%	89.5%
	Electrolyte abnormality	20	14.6%	32.8%
	Sepsis	19	13.9%	31.1%
	Heart failure	14	10.2%	23.0%
	Multi-organ failure	13	9.5%	21.3%
	Uremia	12	8.8%	19.7%
	Pulmonary edema	5	3.6%	8.2%
Total		137	100.0%	225.6%
Treatments needed	Medical only	79	73.8%	
	Medical,dialysis,tansplantation	25	23.4%	
	Surgical intervention	3	2.8%	
Renal replacement(dialsis,transplantation)given : yes	no	**25** **0**	**100%** **0%**	
Length of illness	<1 week	51	47.7%	
	1week -3monthss	35	32.7%	
	>3months	21	19.6%	
Hospital stay	< 1 week	65	60.7%	
	1-2 weeks	25	23.4%	
	2 weeks	17	15.9%	
Total		107	100.0%	

7.3. Treatment outcome of pediatric renal patients

From 107 patients admitted to pediatric ward and ICU in both TGSH and FHCSH 94(87.95%) discharged and 13(12.1%) died with the most common cause of death were multi-organ failure 6(46.2%) followed with multi-organ failure and sepsis 5(38.5%). Table(6). All the deaths needed renal replacement therapy and none of the patients received renal replacement therapy. Table (5)

Table 6: Treatment outcome of pediatric renal patients admitted at TGSH and FHCSH from January 2019 to August 2020(N=107), Bahirdar,Ethiopia.

Variable		**Frequency**	**Percentage (%)**
Outcome	Discharged	94	87.9
	Death	13	12.1
Causes of death	Multi organ failure	6	46.2
	Multi organ failure and sepsis	5	38.5
	Sepsis	2	15.4

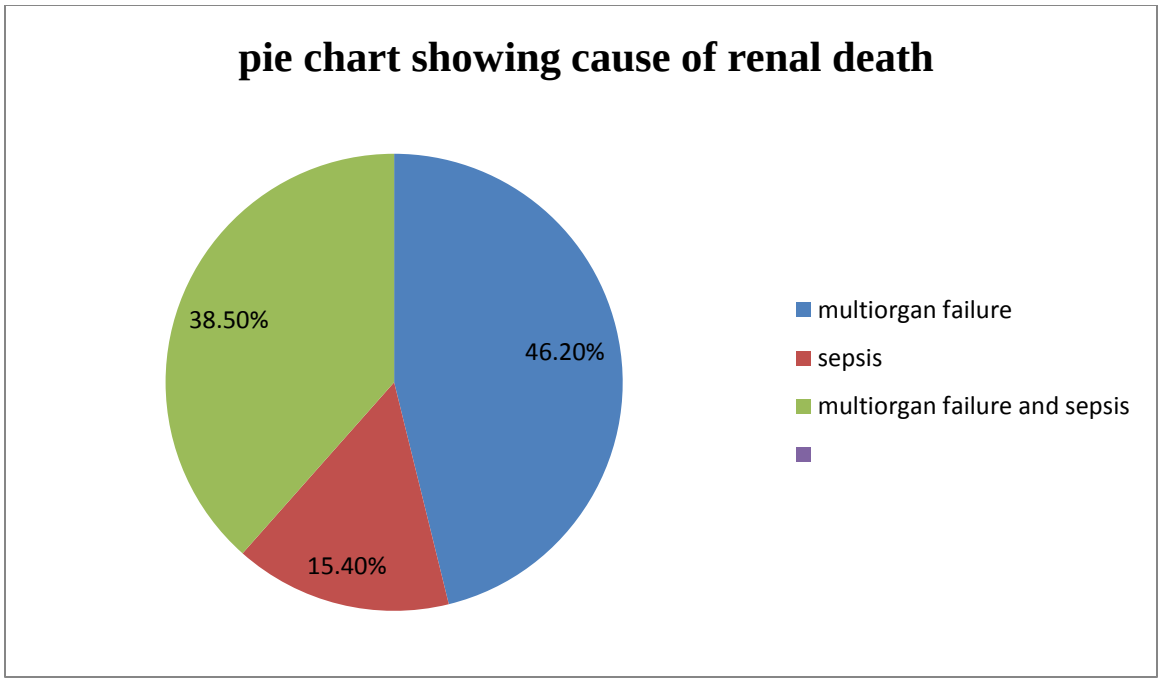

Figure 3: Pie chart showing cause of renal death among hospitalized children at FHCSH and TGSH(N=107).Bahirdar,Ethiopia

7.4. Factors associated with outcome of pediatric patients with renal disease

Pearson's chi -squared test was carried out to assess the presence of association between different independent variables and poor outcome. There was evidence of significant association between the presence of AKI ($x^2=4.484, p<0.05$),presence of CKD ($x^2=6.617, p<0.05$),the presence of complications ($x^2=11.15, p<0.05$),decreased UOP ($x^2=6.618, p<0.05$), electrolyte abnormality($x^2=17.87, p<0.05$),multi-organ failure ($x^2=48.57, p<0.05$),sepsis($x^2=45.29, p<0.05$), heart failure($x^2=14.23, p<0.05$), uremia($x^2=50.01, p<0.05$),seizure or decreased mentation($x^2=45.15, p<0.05$),longer hospital stay> 2weeks ($x^2=23.2, p<0.05$). Age, sex, address of patients and the hospital patients were treated had no association. Although the most common clinical presentation of pediatric patients with renal disease were proteinuria there were no association with the outcome renal patients.(Table 7).

Table 7: chi square test showing the association between factors associated and outcome of pediatric renal patients admitted at TGSH and FHCSH from January 2019 to August 2020 (N=107),Bahirdar, Ethiopia.

Variable		Outcome		Chi-square	Df	P value
		Death	Discharged			
Age :	less than 5yrs	1	23			
	5-10yrs	8	42			
	11-14yrs	4	29	2.127	2	.345
Sex :	female	4	44			
	Male	9	50	1.188	1	.276
Address :	rural	11	78			
	Urban	2	16	.0222	1	.882
Hospital :	TGSH	6	41	.030	1	.863
	FHCSH	7	53			
Chronic kidney disease :	No	10	90			
	Yes	3	4	6.617	1	**.010**
Acute renal failure:	No	4	58			
	Yes	9	36	4.484	1	**.034**
Complication:	No	0	46			
	Yes	13	48	11.159	1	**.001**
Proteinuria:	No	2	14			
	yes	11	80	.002	1	.963
Multi-organ failure :	No	0	94			
	yes	13	0	48.537	1	**.000**
Presence of decreased UOP	No	1	41			
	Yes	12	53	6.181	1	**.013**
Seizure and decreased mentation :	No	4	90			
	Yes	9	4	45.173	1	**.000**
Uremia :	No	4	91			
	yes	9	3	50.012	1	**.000**
Heart failure:	No	7	86			
	Yes	6	13	14.230	1	**.000**
Electrolyte abnormality :	No	5	82			
	yes	8	12	17.875	**1**	**.000**
Sepsis :	No	2	86			
	Yes	11	8	45.294	1	**.000**
Hospital stay :	< 1week	4	61			
		1	24			
	1week-2weeks	8	9	23.155	2	**.000**
	>2weeks					

8. Discussion

The study was done to determine pattern, outcome and factors associated with pediatric renal disease . The most common renal disease requiring hospital admissions in this study was glomeluronephritis 64 (58.9%) with evidence of acute post streptococcal glomeluronephritis 19(30%) of patients and 25(40%) of patients had renal failure. This finding is higher than reported from study done in Nepal (20). The high number of this cases may be due to environmental factors, high number of referrals when patients had complications for ICU and dialysis treatment though there is no dialysis service.

The second most common renal disease in this study was NS, seen in 9 (8.4%) of the cases. This result is comparable to studies from Latin American study(17) and Nigerian Zamfaran study(14) but lower than Turkey,Tikuranbesa, Bangladish study (19,7,3).

The third and fourth causes of renal diseases were chronic renal disease and acute kidney disease as an initial diagnosis responsible for 7(6.5%) and 6(5.6%) of the cases. This finding were lower than found in Tikur anbesa, Latin American study(7,17) but higher than Zamfaran state study from Nigeria and Nepal study(14,20). In three of CKD patients the causes were chronic glomeluronephritis and four of the CKD patients died because of multi-organ failure and sepsis and 3 of them needs renal transplantation discharged with referral. One patient with acute kidney injury died because of multi-organ failure and 5 of them discharged with referral for dialysis to Tikuranbesa hospital. The most common cause of AKI were rapidly progressing glomeluronephritis 4(64%) and APSGN.

CAKUT were also responsible for 7(6.5%) of cases where PUV was the leading causes accounting in 3(49%) of the cases this finding is lower than reported from Tikuranbesa which was the most common renal diagnosis in Tikuranbesa hospital. This may be because tikuranbesa is the center of the overall countries referral system and 4(64%) of our patients with CAKUT also referred for further work up and surgical intervention. other causes responsible for 14(13%) of the cases and UTI were responsible among the commonest causes accounting 6(5.6%) of other causes. This finding contrasts with the study done in Nigeria two states (14,8).

The majority of the patients in this study were males 55.1% and most patients were from rural areas 83.2% and 46.7% of patients were between 5and 10 years, the commonest age where post infectious glomeluronephritis occur. Although sex ,age and address had no association with the outcome renal disease this finding is consistent with Abakaliks study(8).

Proteinuria were the most common clinical presentation of patients with renal disease 91(85%) followed by edema 84(78.5%), decreased UOP 65(60.7%), hematuria 64(59.8%).This finding was consistent with the clinical presentation of study done in Bangladish (3).

This study showed the presence of complications (sepsis, uremia ,heart failure, multi-organ dysfunction), seizure or decreased mentation, decreased UOP, prolonged hospital stay, electrolyte abnormality, AKI,CKD were associated with death of patients with renal disease with $p < 0.000$, $p < 0.000$, $p < 0.000$, $p < 0.000$, $p < 0.000$, $p < 0.013$, $p < 0.000$,$p < 0.000$,$p < 0.034$,$p < 0.010$ respectively. This finding was consistent with study done in Nepal(20).

From 107 hospitalized children 94(87.95%) were discharged and 13(12.1%) were died with the most common cause of death were multi-organ failure 6(46.2%) followed with multi-organ failure and sepsis 5(38.5%). This finding was higher than reported from with study done in Zamfara state Nigeria(20). This might be related with our treatment modalities where all of the deaths needed renal replacement therapy at least temporarily and none of the patients received renal replacement therapy.

9. Limitation of the study

The limitation of this study was detailed medical history, physical examination, investigations, and treatment was not documented properly that it was not possible to get adequate information to assess the type of renal disease and complications in majority of patients. Small sample size and being chart review and more than 20% of charts were incomplete were the other limitations of this study. Because of small sample size it was not possible to get strong associations from bivariate and multivariate analysis between the different factors and outcome of renal disease(discharge ,death).

Conclusion

From a total of 107 pediatric renal admissions most of the patients were from rural areas and males. The most common cause of renal admission in our setup is glomeluronephritis secondary to post infectious acute glomeluronephritis and renal failure is the most common complication found in this study. Sepsis and multi-organ failure are the most common cause of death. All the deaths had indications for renal replacement therapy and no patient received the therapy. The type of renal disease having acute kidney injury ,chronic kidney disease, the presence of complications (sepsis ,uremia ,heart failure and multi-organ dysfunction), decreased UOP, prolonged hospital stay, electrolyte abnormality, seizure or decreased mentation were associated with death of patients with renal disease with a chi- square test.

Recommendation

For Health Workers; most of renal morbidities and mortalities can be prevented with early diagnosis ,treatment, referral and proper follow up of patients

For regional health bureau and hospital managerial; The study can serve as an input to improve pediatric health services by establishing pediatric renal treatment center and strengthening training programs of pediatric nephrologists and other health workers at primary and secondary levels,

For the Community; the study can give an insight about most of renal problems are preventable and treatable if there is an early health seeking behavior to decrease complications and un necessary referrals to AA.

For Researchers: This study suggests on further community based studies using analytical study designs like cohort study with large sample size .

References

1. Halle MP, Lapsap CT, Barla E, Fouda H, Djantio H, Moudze BK, et al. Epidemiology and outcomes of children with renal failure in the pediatric ward of a tertiary hospital in Cameroon. 2017;17(1):202.
2. Narva ASJKI. The spectrum of kidney disease in American Indians. 2003;63:S3-S7.
3. Qader A, Muin Uddin G, Rahman R, Hanif M, Roy R, Begum AJJPN. Renal diseases in children attending pediatric nephrology centers of Dhaka city. 2016;4(3):86-91.

4. Bhimma R, Kala UJSAJoCH. Childhood kidney disease in developing countries: Is it a forgotten disease? 2016;10(2):103-4.
5. Anigilaje EA, Adesina TCJNPMJ. The pattern and outcomes of childhood renal diseases at University of Abuja Teaching Hospital, Abuja, Nigeria: A 4 year retrospective review. 2019;26(1):53.
6. Barsoum RS. End Stage Renal Disease (ESKD) in Egypt and North Africa. Chronic Kidney Disease in Disadvantaged Populations: Elsevier; 2017. p. 113-23.
7. Mola K, Shimelis DJEmj. PATTERN AND OUTCOME OF RENAL DISEASES IN HOSPITALIZED CHILDREN IN TIKUR ANBESSA SPECIALIZED TEACHING HOSPITAL, ADDIS ABABA, ETHIOPIA. 2016;54(3).
8. Muoneke V, Una A, Eke C, Anyanwu OJAom, research hs. The burden and outcome of pediatric renal admissions at the federal teaching hospital Abakaliki: A 3-year review (2011–2013). 2016;6(4):243-50.
9. Obiagwu P, Lugga A, Abubakar AJNjocp. Pattern of renal diseases in children attending paediatric nephrology clinic of Aminu Kano Teaching Hospital, Kano. 2019;22(7):920.
10. Kore C, Tadesse A, Teshome B, Daniel K, Kassa AJJNT. The magnitude of chronic kidney disease and its risk factors at Zewditu Memorial Hospital, Addis Ababa, Ethiopia. 2018;8(3):313.
11. Bello AK, Levin A, Tonelli M, Okpechi IG, Feehally J, Harris D, et al. Assessment of global kidney health care status. 2017;317(18):1864-81.
12. Prasad N, Patel MRJFim. Infection-Induced Kidney Diseases. 2018;5:327.
13. Ali A, Ali MU, Akhtar SZJJ. Histological pattern of paediatric renal diseases in Northern Pakistan. 2011;61(653).
14. Garba B, Muhammad A, Obasi A, Adeniji AJSAJoCH. Presentation and pattern of childhood renal diseases in Gusau, North-Western Nigeria. 2017;11(2):96-8.
15. Ladapo TA, Esezobor CI, Lesi FEJSJoKD, Transplantation. Pediatric kidney diseases in an African country: prevalence, spectrum and outcome. 2014;25(5):1110.
16. Ingelfinger JR, Kalantar-Zadeh K, Schaefer F, Committee WKDS. World Kidney Day 2016: averting the legacy of kidney disease—focus on childhood. Springer; 2016.
17. Orta-Sibu N, Lopez M, Moriyon JC, Chavez JBJPn. Renal diseases in children in Venezuela, South America. 2002;17(7):566-9.
18. Albar HJNMSJ. Spectrum And Outcome Of Pediatric Renal Diseases In Dr. Wahidin Sudirohusodo Hospital Makassar. 2017;1(2):10-5.

19. Kara MA, Kilic BD, Çöl N, Özçelik AA, Büyükçelik M, Balat AJIjokd. Kidney disease profile of Syrian refugee children. 2017;11(2):109.
20. Yadav SP, Shah GS, Mishra OP, Baral NJSJoKD, Transplantation. Pattern of renal diseases in children: A developing country experience. 2016;27(2):371.
21. Ali E-TM, Rahman AH, Karrar ZAJSJoP. Pattern and outcome of renal diseases in hospitalized children in Khartoum State, Sudan. 2012;12(2):52.
22. Hessey E, Ali R, Dorais M, Morissette G, Pizzi M, Rink N, et al. Renal function follow-up and renal recovery after acute kidney injury in critically ill children. 2017;18(8):733-40.
23. Patzer RE, McClellan WMJNRN. Influence of race, ethnicity and socioeconomic status on kidney disease. 2012;8(9):533.
24. Jha V, Arici M, Collins AJ, Garcia-Garcia G, Hemmelgarn BR, Jafar TH, et al. Understanding kidney care needs and implementation strategies in low-and middle-income countries: conclusions from a "Kiney Disease: Improving Global Outcomes"(KDIGO) Controversies Conference. 2016;90(6):1164-74.

Annexes

Annex I: Checklists

This Checklists was developed by the principal investigator after revising different literatures on pattern, outcome and factors associated with outcome of renal disease among hospitalized children(5,6,7,19,18).

Checklists

1. socio-demographic data

MRN ------ -- Sex of patients a, female b, male

AGE(months,years) ------

Address (just fill the name) ----------

a. Rural

b. Urban

2. Causes of renal disease

2.1. Nephrotic syndrome

2.2. Glomerulonephritis

2.2.1. Acute post streptococcal glomeluronephritis

2.2.2. Rapidly progressive glomeluronephritis

2.2.3. Chronic glomeluronephritis

2.3 CAKUT

2.3.1. Posterior urethral valve

2.3.2. PUJ obstruction

2.3.3. Ectopic kidney

2.3.4. Others (Polycystic kidney disease ,multi-cystic dysplastic kidney,Bladder extrophy)

2.4. Acute kidney injury

2.5. chronic kidney disease

2.6. Other causes (UTI, sepsis,HSP,HUS,SLE,wims tumor and other malignancies)

3. Presence of renal failure (yes or no)---------

a. Acute renal failure

Cause if known----------

b. Chronic renal failure

causes if any known----------

4. Clinical features (history and physical findings)

a. Decreased urine output
b. Edema
c. Associated symptoms (Vomiting , diarrhea, Fever)
d. Body rash
e. Urinary symptoms(frequency urgency,dysuria)
f. Hypertension
g. Abdominal or flank mass
h. Seizure decreased mentation
i. Hematuria

5. Laboratory and ultrasound findings

5.1. Possible laboratory findings

a. Elevated serum creatinine and BUN level
b. Low serum albumin
c. Proteinuria
d. Sign of UTI(pyuria, leukocyte esterase, nitrite)
e. Elevated ASO titer

f. blood culture result with identified organism if any----------

g. serum cholesterol and serum TG level

5.2. Abdominal ultrasound findings

a . Normal

b. Parenchymal renal insult

c. Bilateral shirinked or enlarged kidney

d. Anatomic abnormality (Hydronephrosis, PUV,horseshoe kidney,ectopic kidney)

6. Presence of complications (yes or no)----------

6.1. Uremia 6.2. Heart failure

6.3. Pulmonary edema 6.4. Electrolyte abnormality

6.5. Multi-organ failure 6.6. Sepsis

7. Outcome of patients

a. Discharged improved

b. Discharged against medical advice

c. Referred and reasons for referral

i. dialysis

ii. transplantation

iii. Surgical intervention, further work

d. Death if so possible cause of death----------

8. Duration of hospital stay in hours or days----------

9. Length of illness in days or months----------

10. Admission time in months and years ----------

11. More information to add----------

Annex II: Declaration

I undersigned declare that this pediatric specialty certificate, Thesis Report is my original work and it has not been presented for a degree in any other university. All source materials used for the research thesis have been duly acknowledged.

Name of student: Dr Yenework Tafere(Pediatric and Child Heath Resident).

Email; tafereyenework4@gmail.com

Cell phone ;0911072414

Signature: _____ Date _____.

Advisors:

1. Dr Yalemwork Anteneh(assist/ professor of pediatrics and child health)

   Email; Yalexanteneh@gmail.com

   Cell phone;0912660477

   Signature: _____ Date _____.

2. Ato ZEMENU Shiferaw (MPH in Reproductive Health)

   Email;zeds2010@yahoo.com

   Cell phone; 0910028125

   Signature: _____ Date _____.