

CHRONIC KIDNEY DISEASE IN NIGERIA

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Introduction

- Chronic Kidney Disease is defined as presence of renal damage or/ and reduction in GFR of < than 60mls/min/1.73 m² of BSA for at least 3 months
- Presence of renal damage could be abnormal urinary sediments, structural abnormality of the kidney as evident on imaging or deranged biochemical parameters such as urea and creatinine

- The global burden of CKD is enormous.
- The WHO report in 2002 and Global Burden of Disease project reports showed that disease of the kidney and urinary tract caused 1 million deaths in 2002, ranking 12th in the list of world's major causes of death
- The global incidence and prevalence of CKD have increased exponentially in the last decade and now assumed epidemic proportions in both developed and developing countries including Nigeria.

EPIDEMIOLOGY

- In Nigeria, like in many other developing countries, accurate data on prevalence of CKD are lacking principally due to unavailability of a national renal registry.
- Small scale community studies in Nigeria found that the prevalence of CKD in adults ranges between 19% to 30% while it was estimated to be 15 per million population in paediatric population.
- Hospital prevalence studies showed that ESRD accounts for 6-12 % of medical admissions

Representative Population based Studies on CKD Epidemiology

STUDY	COUNTRY	DESIGN	N	Prevalence of Microalbuminuria	Prevalence of CKD (GFR < 60mls/min)
NHANES III	USA	CS/L	15,626	12%	11%
PREVEND	NETHERLANDS	CS/L	40,000	7%	
TAIWAN	TAIWAN	CS/L	462,293		12%
TAKAHATA	JAPAN	CS	2,321	14%	
BEIJING	CHINA	CS	13,925		13%
AusDiab	AUSTRALIA	CS	11,247	6%	10%
Afolabi et al	NIGERIA	CS/ hosp. based	250	12.4%	10.4%

- It has been established that CKD is largely unrecognized and inadequately diagnosed.
- Most patients present very late in end-stage renal disease in Nigeria and are thought to represent a tip of the iceberg of the entire burden of CKD.
- Nigerian adults in their most economically productive years are mostly affected as the peak incidence of CKD was found to be in the 3rd to 5th decade of life.

Classification of CKD based on GFR as proposed by KDOQI

STAGE	DESCRIPTION	CLASSIFICATION BY SEVERITY
1	KIDNEY DAMAGE WITH NORMAL OR INCREASED GFR	GFR > 90mls/min
2	KIDNEY DAMAGE WITH MILD DECREASE IN GFR	GFR of 60-89mls/min
3	MODERATE DECREASE IN GFR	GFR of 30-59mls/min
4	SEVERE DECREASE IN GFR	GFR of 15-29mls/min
5	KIDNEY FAILURE	GFR of < 15mls/min or on dialysis

Diagnosis of CKD

- This is based on history, physical examination and investigation.
- HISTORY: may be asymptomatic at the early stage, facial and generalized body swelling, malaise, weakness, nocturia, frothiness of urine, reduced urinary output, recurrent vomiting, hicough, puritus, bone pain, breathlessness
- PHYSICAL EXAMINATION: palor, oedema, hypertension, scratch marks, LVH, cardiomegaly
- INVESTIGATION: abnormal urinary sediments, anaemia, deranged EUCr, reduce renal sizes on imaging, abnormal Ca,PO₄ and lipid profile.

Markers of Renal Damage

- Proteinuria
- Haematuria
- Structural abnormality of kidneys on imaging
- N-acetyl-beta-D-glucosaminidase
- Retinol binding protein
- Beta-2-microglobulin
- Urinary excretion of mononuclear cells
- Cystatin C
- Creatinine

Common Aetiologies of CKD in Nigeria

- Chronic glomerulonephritis
- Hypertension
- Diabetes Mellitus
- Obstructive Uropathy
- HIV
- Autoimmune Disease esp SLE
- Sickle Cell Disease
- Toxic Nephropathies

Summary of Risk Factors Associated with the Initiation and Progression of CKD

INITIATION FACTORS	PROGRESSION FACTORS
Systemic Hypertension	Old Age
Diabetes Mellitus	Male gender
Cardiovascular disease	Race / Ethnicity
Dyslipidaemia	Genetic predisposition
Obesity/ Metabolic Syndrome	Poor blood pressure control
Hyperuricaemia	Poor Glycaemic control
Nephrotoxins exposure: NSAIDs, Analgesic, Herbs, heavy metals such as lead, Mercury containing soaps and creams	Dyslipidaemia, Smoking, Obesity/ Metabolic syndrome, Hyperuricaemia, Alcohol, NSAIDs, Herbs, low socioeconomic status, AKI
Low Socioeconomic status	Cardiovascular disease

Management of CKD

This involves a multidisciplinary approach that comprises of:

- Early diagnosis and prompt referral to Nephrologist when indicated.
- Retardation of progression of CKD ,
- Preparation for RRT
- Provision of RRT

Retardation of Progression of CKD

- Lifestyle Modification: Stop smoking, adequate exercise to lose weight especially in obese individuals, reduction in alcohol consumption, reduce protein and salt intake, practise of healthy sexual life to prevent STI including HIV
- Screening for HIV, HBV, HCV: Treatment should be offered as early as possible if indicated. Vaccines against HBV should be given in non-immunized individuals
- Avoidance of nephrotoxic agents like NSAIDs, contrast material, gentamicin, herbs, mercurial creams and soaps
- Adequate BP control with a target of 130/80mmHg in those with < 1g proteinuria and 125/75mmHg in those with > 1g proteinuria

- Treatment of proteinuria using ACEi or ARBs
- Adequate Glycaemic control in diabetics with a therapeutic goal of achieving glycated haemoglobin of $< 6.5\%$
- Treatment of Anaemia using haematinics, parenteral iron and ESA with a therapeutic goal of Hb concentration of 11-12gm/dl.
- Treatment of metabolic acidosis using Sodium bicarbonate.
- Correction calcium and phosphate abnormalities calcium supplements, calcimimetic and phosphate binders.
- Treatment of dyslipidaemia using statins

Preparation for RRT

- CKD stage 4 patients should be prepared psychologically and financially for RRT. This may involve support from psychologist, religious institution, renal team, other ESRD patients on RRT and family members.
- RRT options should be discussed with patients in details.
- Vascular access should be created by referral to vascular surgeon at this stage.
- Searching and screening for potential kidney donors

Provision of RRT

- Haemodialysis
- Peritoneal Dialysis
- Renal Transplantation

Financial Burden of ESRD

- In the United States, it has been estimated that the annual expenditure on ESRD will reach more than 52 billion US\$ by 2030.
- In the United Kingdom, renal services currently consumes about 2% of the National Health Service budget, and this is set to rise with the increasing numbers of individuals requiring RRT.
- About 90% of those receiving adequate RRT live in high economies. More than 100 of 212 countries worldwide with low and medium economies do not have any provision for RRT, hence ESRD is a DEATH SENTENCE in these countries.

Cost implication of HD in Nigeria

INSTITUTION	LOCATION	Cost of One session of HD	Govt Subsidy
UBTH	Benin	15,500	NO
UPTH	Port-Harcourt,	30,000	NO
UCH	Ibadan	26,000	NO
	Kastina	5,000	YES(for indigenes)
UYO Teaching Hospital	Uyo	12,000	NO
OAUTH	Ife	20,000	NO
NDUTH	Bayelsa	15,000	

Challenges of Haemodialysis

- Non-affordability to most patients
- Poor vascular access.
- Inadequacy of HD centres and machines
- Inadequacy of skilled manpower
- Poor technical support
- High running cost e.g poor power supply

Challenges of Peritoneal Dialysis

- Non- affordability
- Poor level of hygiene
- Poor environmental sanitation
- Lack of space
- Lack of skilled manpower
- Lack of government commitment

Average Cost implication of HD care in UBTH

- Average cost of one HD session and EPO = 22,100
- Cost of three HD sessions and EPO/week= 66,300
- Cost of HD sessions and EPO/ month = 265,200
- Cost of HD sessions per yr = 3,182,400

From the above, it is obvious that HD care is above the reach of an average Nigerian. Our government needs to find ways of subsidizing renal care while attempts are being made towards prevention and early diagnosis of CKD.

PREVENTION OF CKD

- Adequate obstetric care to avoid low birth weight and prematurity
- Good environmental sanitation
- Lifestyle modification: Stop smoking, regular exercise
- Regular screening of at risk population
- Early diagnosis and treatment of hypertension, diabetes mellitus, infections such as UTI, proteinuria, dyslipidaemia

International Recommendations for Targeted Screening for CKD

Target Group	KDOQI	UK NICE	CARI(Australia)	CSN(Canada)
Elderly	.			
Hypertension
Diabetes Mellitus
Atherosclerotic		.	.	.
Cardiovascular disease: Heart failure		.		.
Urologic dx; stones , recurrent UTIs	.	.		
Autoimmune condition	.	.		.
Nephrotoxic drugs	.	.		.
High risk ethnic groups	.		.	.
Family hx of CKD	.	.		

Guidelines for Screening for CKD in Nigeria

- All adults on first contact with a medical practitioner
- Screening should involve BP check, urinalysis, serum creatinine, eGFR and blood sugar.
- Annual screening with BP check, urinalysis, serum creatinine, eGFR for > 25 years and blood sugar for >40 years.
- High risk group should be screened at contact and 6 monthly thereafter
- Diabetics should be screened for microalbuminuria at least annually

High Risk Group for CKD

This is defined by the following considerations:

- Elderly > 60 years
- Hypertensives
- Diabetics
- Obesity
- Family history of CKD
- HIV Infection
- Sickle cell anaemia
- Chronic use of herbs, analgesics and bleaching creams

What to do when CKD is detected

- Stage the disease
- Take appropriate measures depending on the stage
- Early referral to a Nephrologist when indicated

When to refer to a Nephrologist following screening

- Stages 1 and 2 CKD when the cause is unknown
- Stages 3-5 CKD
- Special conditions irrespective of the stage such as nephrotic range proteinuria, ectopic kidneys, polycystic kidney disease, bone disease, anaemia, pregnancy, haematuria where a urological cause is not evident

CONCLUSION

- The prevalence of CKD is on the increase globally with its attendant huge socioeconomic burden especially in developing nations like Nigeria. Early detection through screening of at risk groups will help in reducing this burden.
- Government and corporate bodies should also be encouraged to subsidize renal care for those with end stage renal disease as done in developed countries .