EDITORIAL

Fight to Prevent Chronic Kidney Disease (CKD)

Chronic Kidney disease (CKD) is a word wide public health problem. Incidence and prevalence are rising worldwide with poor outcome and high cost of treatment. CKD is defined as kidney damage or decrease in Glomerular filtration rate GFR below 60ml/min per 1.73 m^2 for 3 months or more irrespective of cause with or without kidney damage. Kidney damage is defined by structural or functional abnormalities of the kidney with or without decreased GFR, manifested by either pathological abnormalities or marker of kidney damage such as abnormalities of blood, urine, or in the imaging tests. Markers of kidney damage are proteinuria, microalbuminuria, haematuria and presence of casts with cellular elements.

Chronic kidney disease is classified in 5 stages based on Glomerular filtration rate (GFR).

Classification of CKD based on GFR

CKD stage	Description	GFR	(ml/min/ 1.73 m^2)
1.	Kidney damage with normal or	↑GFR	≥90
2.	Kidney damage with mild	↓GFR	60-89
3.	Kidney damage with moderate	↓GFR	59-30
4.	Kidney damage with severe	↓GFR	29-15
5.	Kidney Failure		≤15

Classification of CKD based on GFR as proposed by the kidney Disease Outcome Quality Initiative (KDOQI) guidelines.[1] The true incidence and prevalence of CKD in our community are difficult to ascertain as early to moderate CKD is usually asymptomatic and due to lack of enough studies in our country.

However, different studies were carried out to find the prevalence of diabetes mellitus, hypertension and proteinuria. Prevalence of diabetes was 4.1%, hypertension 11.6% and proteinuria 7.7%[2]. Low eGFR (<60ml/min/m^2) was found 14.8% using Cockcroft-Gaul (C-G) formula and 12.1% using modification of Diet in Renal Disease (MDRD) formula[2]. Another study showed prevalence of Diabetes 4%; hypertension 11% and proteinuria 6% in rural area of Bangladesh[3]. National Health and Nutrition Evaluation Survey (NHANES) observed chronic kidney disease is 15.2%; out of which diabetes constitute 7.7% in community prevalence in USA in 2003-2006.[4] Community prevalence of early kidney disease in Australia observed haematuria 5.6%; proteinuria 2.4%; albuminuria 6%, chronic kidney disease 12%.[5] The community prevalence of chronic kidney disease in Norway showed diabetes mellitus 4.4%; hypertension 24%; microalbuminuria 6%; proteinuria 2.% and chronic kidney disease 10.5%[6]. Global kidney disease prevention describe prevalence CKD varies 11 to 33%, microalbuminuria 12 to 19%, dipstick proteinuria 6 to 31%, eGFR 60ml/ min/1.7m^2 in 2.5 to 18%[7]. The disease profile of the world is changing and chronic diseases accounts for the majority of global morbidity and mortality rather than infectious disease. The causes of chronic kidney disease reflects this change. Diabetes and hypertension is now major cause of end stage renal failure world wide[8]. Primary causes of renal failure in USA are diabetes 43.8% followed by hypertension 26.5%; glomerulonephritis 7.6%, cystic disease of kidney 2.3%, urological disease 2%,other causes 17.5%[9]. However, the causes of chronic kidney disease in Bangladesh are glomerulonephritis 47%, diabetes mellitus 24%, hypertension13%, obstructive uropathy 8%, undetermined 6%.[10]

Incidence of end stage renal disease (ESRD) refers to the number of patients with ESRD beginning renal replacement therapy (RRT) during a given time (usually a year) in relation to population (usually in a year), it is expressed as number of patients per million population for year. Usually the incidence of ESRD does not take into account patients not treated by RRT, so it underestimate the overall true incidence of ESRD (CKD stage 5). The prevalence of ESRD encompresses both new and continuing patients on RRT. The incidence and prevalence of ESRD vary widely from country to country. Incidence and prevalence of renal replacement

therapy (RRT) in United States 360 of 1625 respectively per million population (PMP) in 2006. In Australia, the incidence and prevalence cases on RRT are115 of 778 respectively per million population in 2006. In UK this RRT rate are 113 of 725 PMP.[11] In Bangladesh, prevalence of all new and old cases in haemodialysis from 1998 to 2010 are 24112. The prevalence of all transplant cases is 685 from 1988 to 2010 and prevalence of CAPD patients 420 from 1998 to 2010. [12] Risk factors for CKD are susceptibility, initiation and progression factors. Susceptibility factors predispose to CKD, initiation factors directly trigger kidney damage and progression factors one associated with worsening on already established kidney damage. The initiating factors are systemic hypertension, diabetes mellitus, cardiovascular disease dislipidaemia, obesity (metabolic syndrome). hyperuricemia, smoking, low socioeconic status and nephrotoyic exposare (NSAID, analgesic, heavy metal) and progression factors are older age, male gender, genetic predisposion, poor blood presure control, poor glyceamic control, proteinuria[13]. The risk factors are classification as modifiable and nonmodifiable. Modifiable risk factors include hypertension, proteinuria, metabolic factors, smoking, alcohol consumption and drugs. Patients with early stage of CKD is 5 to 10 times more likely to die from ccardiovascular events before reaching ESRD [14]. Many CKD patients with GFR below 60 ml/min/1.73 m^2 die from cardiovascular or other causes before they reach ESRD[14]. Cardiovascular risk factors for CKD patients are divided traditional and nontraditional. Traditional risk factors are same as initiating factors. However, non-traditional risk factors are albuminuria, anemia, abnormal Cal/PO_4 metabolism, high PTH level, ECF overload, Vit D analogue, electrolyte imbalance, inflammation, malnutrition, oxidative stress, thrombogenic factors and homocysteine.[13]

The cost of treating patients with ESRD is substantial and has an impact on health care system of the country. Globally it assumed, 2 million individual was treated with RRT in 2010 at cost of US $1 trillion during the decade. The great majority (90%) of those treated who live in high economies. More them 100 of 212 countries of the world with low and middle economies do not have enough provision for RRT. Therefore, low and middle economies countries ESRF is a death sentence [15] .

In Bangladesh only 10% of ESRD patient can afford renal replacement therapy in the form of haemodialysis, continuous ambulatory peritoneal dialysis and kidney transplantation. Cost of ESRD patients care by maintenance haemodialysis or renal transplant in our countries about US$ 6000/per patient/ year and for CAPD US$ 8000/Patient/ year[12]. Therefore to solve the problem, early detection and prevention of CKD is the answer. To create public awareness, to know about their kidneys **"World Kidney Day"** stated in 2006 with different theme every year. World kidney day is a joint initiative between the International Society of Nephrology (ISN) and International Federation of Kidney foundation (IFKF). In Bangladesh, every year world kidney day is observed with the other countries of the world. Kidney disease is a "silent killer" which will largely affect the quality of life. In 2011, world kidney day prescribe 7 golden rules or easy ways to reduce of risk of developing kidney disease[16]. The seven golden rules are (1) Keeping fit and active (2) Keep regular control of blood sugar level (3) Keep blood pressure control (4) Eat healthy and keep your weight in check (5) Not to smoke (6) Not to take over the counter pill on a regular basis and finally (7) Check your kidney function if you have one or more of the high risk factors such as (a) If you have diabetes (b) if you have hypertension (c) if you are obese (d) if you or one of your family members suffer from kidney disease (e) if you are African, Asian or Aboriginals is origin.

In summary, chronic kidney diseases is one of the leading causes of death in the world. In Bangladesh, prevalence of CKD is 14.8%. and prevalence of hypertension varies form 11.6% to 19%, diabetes mellitus 4.1%, and proteinuria varies from 6 to 7.7% Causes of end stage renal disease are glomeralonephrits 47%, diabetes mellitus 24%, hypertension 13%, obstructive uropathy 8% undetermined 6% cases . About 30,000 patients developed ESRD per year in Bangladesh. Only 10% of those patients can afford to bear the cost of treatment for renal replacement therapy. More than 100 nephrologists, equal number urologists, 20 transplant surgeons about 200 dialysis nurse and

twenty dialysis engineers constitute existing manpower in Bangladesh. If we consider 18 million people are suffering from CKD and 100 nephrologists for this group of patients is very few which means average 800 patients per nephrologist/ day. Considering this situation, prevention and early detection of CKD cases is the answer to face the problem of kidney disease in Bangladesh.

(J Bangladesh Coll Phys Surg 2013; 31: 1-3)

Prof. Dr. Shamim Ahmed
Director & Professor of Nephrology (Former)
National Institute of Kidney diseases and Urology,
Dhaka, Bangladesh.

References:

1. National Kidney Foundation, K/DOQI, Kidney disease outcome quality initiative. Am J. Kidney Dis; 2002; 39 (Suppl.1): SI-S266
2. KS. Alam, M.N Huda, HU Rashid, Prevalence of Diabetes mellitus, Hypertension, Proteinuria and Association of these risk factors with estimate Glomerular Filtration Rate (eGFR) in adult disadvantaged population. Bang. Renal J. 2010; 29 (1): 1-6
3. MO Faroque, HU Rashid, MH Rahman. Prevalence of Diabetes mellitus, hypertension and proteinuria in a rural area of Bangladesh. Bang. Renal J. 2010; 29 (1): 7-11.
4. Unital States Renal Data System, 2008; Annual Data Report. Volume one. Altas of chronic Kidney disease in the United States Page 1.
5. RC Atkins, Community prevalence of early kidney disease. Kidney Int. 2005; 67: 594.
6. SI Harlan, Prevalence chronic kidney disease in Norway J. Am Soc. Nephro 2006l; 17: 2275.
7. AJ. Collins. Global kidney disease prevention Am J. Kid. Dis. 2011; 57(3): 361.
8. Atkins RC. The Epiclemiology of chronic kidney disease. Kidney Int. 2005; 94: S14-18.
9. United States Renal Data System. (USRDS). 2007. Annual Data Report Arailable at : www.usrds.org
10. HU Rashid. 1986-1998. Bangladesh Renal Registry Report. Bang. Renal J. 2002; 2(1) : 25-28 .
11. US Renal Data system. USRDS 2007. Annual data Report: Atlas of End stage renal disease in United States. Available at: www. surds. org.
12. Prevalence of Haemodialysis, Renal transplant CAPD patient published in Kidney Foundation Bangladesh Bulletin 2012 available: www. kidney foundationbd.com.
13. Teal WW. Brenner BM. Renal risk scores: Progress and prospect Kidney Int. 2008; 13: 1216-1219.
14. Keith DS, Nichol, Galleon CM et.al. Longitudinal follow wp and outcome among a population with chronic kidney disease in a larged managed care organization. Arch. Intern Med. 2004; 164: 654-663.