Epidemiology: Open Access

Habas et al., Epidemiology (Sunnyvale) 2016, 6:5
DOI: 10.4172/2161-1165.1000264

Research Article OMICS International

Chronic Kidney Disease in Libya, Cross-sectional Single Center Study

Elmukhtar M Habas[1*], **Jamila Elamouri**[1] **and Amnna A Rayani**[2]

[1]*Department of Medicine, Tripoli Central Hospital, Nephrology Units, Tripoli, Libya*

[2]*Children Hospital, Tripoli, Libya*

[*]**Corresponding author:** Elmukhtar M Habas, Consultant Physician, Department of Medicine, Tripoli Central Hospital, Nephrology Units, Tripoli, Libya, Tel: +218925675756; E-mail: elmukhtarh@yahoo.co.uk

Received date: August 22, 2016; **Accepted date**: September 09, 2016; **Published date**: September 16, 2016

Abstract

Background: Chronic kidney disease (CKD) is a common problem globally and has heavy burden on patients and health authorities. Knowing the risk factors of CKD will reduce the prevalence of CKD and its socio-economic effects.

Aim of study: To determine the risk factors that lead to CKD in Libyan patients.

Method: Cross-sectional study based on single-center experience. Two-hundreds and four out-patient's notes were reviewed. All were adults aged >18 years.

Result: Records of 204 CKD patients were reviewed, 55.4% female and 91 (44.6%) patients were male. Patient's mean age was 51.9 ± 15.7 years, and there was not significant difference between the mean ages of both sexes. Patient's distribution at presentation according to CKD stages was stage-I (15.7%), stage-II (16.7%), stage-III (34.8%), stage-IV (19.6%) and stage-V (13.2%). Diabetes mellitus (DM) as a cause of CKD reported in (49%), glomerulonephritis (GN) in (17.6%) and hypertension (HTN) in (9.3%) of patients. More than 50% of the patients had strong family history of CKD. Unidentifiable cause of CKD recorded in 4.9%.

Conclusions: Stage-III is the commonest stage of CKD at presentation. DM, GN and HTN respectively are the common cause of CKD. Good control of DM and HTN reduces risk of CKD and renal failure significantly.

Keywords: Renal failure; CKD in Libya; Hypertension; Glomerulonephritis; Diabetes mellitus

Abbreviations: DM: Diabetes Mellitus; HTN: Hypertension; GN: Glomerulonephritis; CKD: Chronic Kidney Disease

Introduction

CKD is a leading cause of end-stage renal disease and chronic renal failure. CKD patients cost heath authorities more expenses for their care. Epidemiological studies of the adult population in several countries report CKD prevalence of 9%-11% [1]. In general, prevalence of CKD is higher in women than men, and it is more in population aged>60 years [2]. CKD is defined as kidney damage that reduces kidney function for more than three months, leading to low measured or estimated glomerular filtration rate (eGFR) ≤ 60 mL/min/1.73 m^2 body surface area that possibly associates with presence of abnormalities in urine sediment, renal imaging or biopsy results [3]. CKD has been identified as a risk factor for death due to its associated diseases or its complications as cardiovascular-related complications which lead to more morbidity and substantial burden on the health care system. In the developed and developing countries, CKD prevalence is increasing mostly due to the steady increase in the aged population in those countries during the last decades, and people in these ages groups are more liable to develop CKD and DM and HTN [3,4]. In addition to DM and HTN which are associated with aging and obesity in developed countries, and now in some developing countries other risk causes as glomerular diseases and tubulointerstitial insults due to infections, nephrotoxic drugs and herbal medications, environmental toxins and occupational exposure to pesticides had been reported as causes of CKD in developing countries [4], during 1990s and later, CKD due to unknown etiology (CKDu) was observed in countries as El Salvador, Nicaragua, Costa Rica, Sri Lanka, Egypt and India. CKDu has different epidemiological characteristics to the traditional CKD, while CKDu is more predominant in younger male than older farmer [1]. Up to our knowledge, there was not any data published before about the main risk factors and the stage of CKD at presentation in Libya. Therefore, this cross-section retrospective single center experience study was conducted to explore the main risk factors of CKD and the stage of CKD at presentation in one of the main referral centers in Tripoli-Libya.

Method

Descriptive cross-sectional study included all files of patients diagnosed having CKD aged ≥ 18 years follow up in nephrology Out Patient Clinic in Medical department-Tripoli Central Hospital. Data was collect from patients' follow-up files during 2007-2009. Demographic data for age, sex, medical history for DM, HTN, drug intake, etc. was collected. Investigations as serum creatinine (SCr), S. Urea, hemoglobin (Hb), plasma total protein and albumin, urine protein: creatinine ratio was done. Family history of renal disease of CKD was noted. Patients' inclusion criteria were; age between 18-90 years, CKD stages 1-5 as defined by the national kidney foundations

kidney disease outcomes quality initiative (KDOQI) guidelines according to calculated GFR calculation equation. GFR was calculated by Cockcroft-Gault equation. (eGFR=(140-age) × weight (kg)/72 × SCr in mg/dl) for male. If female multiple by 0.85.

Statistical analysis

Data were analyzed by using SPSS version 18; descriptive statistics as mean, median, mode were calculated for quantitative variable. Chi-square and independent t-test were used when needed, P-value ≤ 0.05 considered statistically significant.

Result

A single medical center cross-sectional study of 204 CKD-patients including 91 male patients and 113 female patients (44.6% and 55.4%).

The studied patient's average age was 51.9+15.7 (mean ± SD) years. Their age was ranged 17-80 years (Table 1). More than a third of included patients were aged ≥ 60 years (38.7%). There were not statistical significance difference between the mean age of male and female (P=0.14).

Age group / years	No.	%
≥ 35	39	19.1
36-59	86	42.2
≥ 60	79	38.7
Total	204	100

Table 1: Distribution of patients according to age.

Relation between age groups and stages of CKD clearly shown in Table 2, age group <39 years, more than third of patients were presented by stage I (38.5%), stage II and stage III 15.4% each, stage IV 17.3% and 13.5% by stage 5. Age group 40-60 years, nearly half of them were presented by stage III, while 6.7% by stage IV. In age group ≥ 60 years, none had stage I, more than a third had stage III (38.1%) and 22.2% had stage IV and same percentage had stage V. There was a significant difference in CKD stage in relation to age at presentation (X2=42.39; df=8; P=0.0001) (Table 2).

About two third of the patients had both DM and HTN (61.7%). Patients had DM without HTN were 23 (41.8%). On the other hand, patients had HTN only were 32 patients (58.2%) (Table 3).

CKD Stages	Age group/year							
	≥ 39		40-60		>60			
	No.	%	No.	%	No.	%	total	%
Stage I	20	38.5	12	13.5	0	0	32	15.70%
Stage II	8	15.4	15	16.9	11	17.5	34	16.70%
Stage III	8	15.4	39	43.8	24	38.1	71	34.80%
Stage IV	9	17.3	17	19.1	14	22.2	40	19.60%
Stage V	7	13.5	6	6.7	14	22.2	27	13.20%
Total	52	100	89	100	63	100	204	

Table 2: Relation between percentage of patients in accordance with stage of CKD disease and age groups.

	HTN				Total	
DM	Yes		No		No.	%
	No.	%	No.	%		
Yes	92	61.7	23	41.8	115	56.4
No	57	38.3	32	58.2	89	43.6
Total	149	100	55	100	204	100

Table 3: Distribution percentage of patients according to DM and HTN.

Detailed analyzing of the causes of CKD according to age; in age group ≤ 39 years 42.3% were due to GN, 23.1% due to DM, and 9.6% due to autoimmune diseases. The causes of CKD in age group 40-60 years 55% were due to DM, 15.7% due to GN, and 7.9% due to HTN. In age group ≥ 60 years, the leading causes were DM (61.9%), HTN were second with 17.5% and history of urinary stone reported in 6.4% (Table 4).

CKD Cause	Age group/year						All ages	
	≥ 39		40 -60		≥ 60			
	No.	%	No.	%	No.	%	total	%
DM	12	23.1	49	55	39	61.9	100	49
glomerulonephritis	22	42.3	14	15.7	0	0	36	18
HTN	1	1.9	7	7.9	11	17.5	19	9
Adult polycystic kidney disease	3	5.8	5	5.6	1	1.6	9	4
Autoimmune	5	9.6	4	4.5	0	0	9	4
Drugs	2	3.8	4	4.5	3	4.8	9	4
Stone	1	1.9	3	3.4	4	6.4	8	4
Reflux	3	5.8	0	0	0	0	3	2
Infection	0	0	0	0	1	0.5	1	1
Unknown	3	5.8	3	3.4	4	6.4	10	5

Table 4: Show relation between distribution percentages of patients according to cause of CKD and age groups.

Discussion

CKD is recognized as a global public health problem [5]. In this study, CKD is more common in patients aged 40 years or more about two third and about one third of them were aged ≥ 60 years (38.7%). Other studies in India, Malaysia and Northwest of Ireland reported that CKD-stages progressed with age [6-8]. Patients sex may be has an effect upon CKD prevalence. In our series, CKD female patients were more than male patients (113 to 91 respectively). Although it was not statistically significant, but medically and epidemically it may signify that sex can affect CKD prevalence. Our results support other reported results by Singh et al. and others [6-8]. In general, in this study CKD stage-III was the commonest CKD-stage in patient's presentation (34.8%) followed by stage-IV (20%) and then stage-V (13%). This supported by study conducted in Bangladesh that reported CKD stage-III was most common stage at presentation [8]. An Irish health system study reported that majority of patients were classified having CKD stage-III (90.1%) at presentation. In the contrary, it has been reported CKD prevalence was only 17% in his studied series. Prevalence of CKD stages-I, II, III, IV and V was 7%, 4.3%, 4.3%, 0.8% and 0.8% respectively [6]. Other study conducted in Malaysia, patients presented with ESRD (stage-V) (36.8%), stage-IV (18.4%), stage-II (10.5%), stage-III 5.2% [7]. Furthermore, Wijewickrama et al. found most of CKD patients (54%) had stage-V at presentation and only 13% of patients series had stage-III at presentation [9]. Although, there are studies reported nearly the same percentage of patients' presentation in our results, others reported different CKD stages at presentation. The stage of CKD at patient presentation difference might be due to medical services availability, patients care to their diseases and life standard and economic status of some countries. On the other hand patients aged ≤ 39 years, more than one third (38.5%) had CKD stage-I and 15.4% had stage-III and 13.5% had stage-V at presentation. Between age 40-60 years (43.8%) had stage-III and only 6.7% of patients presented having stage-IV. In the contrary, patients aged >60 years were presented by eGFR corresponding to stage-I in (38%), in stage-III, IV and V (22%) with significant difference of CKD-stage at presentation according to age (P=0.0001). It seems that age has a significant effect on the CKD-stage at presentation i.e. the severity of CKD stage more in older patients at presentation. This could be due to the chronicity and poor control of the underlying cause of the risk factor. HTN may be both a cause and a consequence of CKD. In the USA, an increase in either systolic or diastolic blood or both lead to hypertensive renal changes that precipitate CKD and then to kidney failure. Although it is not clearly stated whether HTN is the precipitant for CKD or the CKD is the cause of HTN, but it is well established that both are well related to each other. DM is one of the common diseases in the world. Uncontrolled DM causes severe morbidity and it is one of diseases that lead to death due to e.g. hypoglycemia, coronary heart disease, blindness, stroke and renal failure etc. WHO report in 2016 revealed that DM was affecting 108 million in 1980, and increases during 2014 to 422 million. 10 DM prevalence worldwide in adults aged more than 18 years of age was 8.5% in 2014, and the increase in DM prevalence more in middle and low income countries [10]. In present study, DM reported in about 50% of the patients and HTN recorded in about a fifth of the patients. A study conducted by Crew et al. showed HTN was the second common cause of ESRD in the United States of America. Other study conducted in North Africa HTN was accounts for about 35% of causes [11]. Farag et al. reported that DM and HTN are the predominant causes of ESRD in Egypt, Jordan, Kuwait, Saudi Arabia, Tunis, Qatar, and UAE, while others as Saudi Arabia, Bahrain and Kuwait, (WHO) reported that DM is the main of CKD [12]. Singh, et al. and Wulandari et al. reported that in CKD patients DM and HTN are major risk factors for CKD and renal failure, additionally, Huda et al. found that factors as DM and HTN are

increasing the existing burden of CKD [6-13]. In Japan, Iseki et al. found that 40% of ESRD caused by DM [14]. A Sri Lankan study results showed that DM followed by HTN are the most common cause of CKD in general population especially in patients age ≥ 50 years while GN was the commonest cause of CKD before the forth decade of the age [9]. In the U.K, obesity and DM are the main etiological risk factor for CKD and HTN as a risk factor for CKD is decreasing [15]. On the contrary, chronic glomerulonephritis was the commonest cause of CKD followed by DM and HIV nephropathy [16]. Amoako et al. showed that the leading causes of CKD were chronic GN (33%), DM (22.2%), HIV associated nephropathy (4.4%), and the primary etiology could not be ascertained in about 12.3% of cases [16]. In this study, family history of CKD recorded in 52% of the study group. While El Salvador study by, Orantes et al. reported family history of CKD was positive in 21.6% of the study population [17]. In this series GN as a cause of CKD reported in 18% of patients, while Samuel reported GN Aboriginal children and young adults have increased risk of ESRD mostly due to GN in people ≤ 40 years of age [18]. Samuel et al. report agrees with the incidence reported with our results. Hence, DM and HTN are the commonest risk factors for CKD and renal failure world-wide in most of previous studies, while the results of the present study revealed DM followed by GN then HTN. This difference could due to ethnic origin, environmental factors or cultural habits or others as genetic etc.

Conclusion

DM is the leading cause of CKD. GN is the second common cause of CKD followed by HTN according to this cross-sectional study. Most of patients presents after having CKD stage III. Therefore, early detection of CKD, strict control and early detection of DM and other risk factor as HTN and avoiding 1st and 2nd degree marriage is essential to minimize the burden of CKD and its management cost.

Acknowledgement

Authors thanks all the doctors and nurses and other colloquies for their support and help for finish this work. We should also acknowledge that this work is not financially supported by any one.

References

1. Almaguer M, Herrera R, Orantes CM (2014) Chronic Kidney Disease of Unknown Etiology in Agricultural Communities. MEDICC Review 16: 9-15.
2. Coresh J, Astor BC, Greene T, Eknoyan G, Levey AS (2003) Prevalence of chronic kidney disease and decreased kidney function in the adult US population: Third National Health and Nutrition Examination Survey. Am J Kidney Dis 41: 1-12.
3. Arora P, Vasa P, Brenner D, Iglar K, McFarlane P, et al. (2013) Prevalence estimates of chronic kidney disease in Canada: results of a nationally representative survey. CMAJ 185: 417-423.
4. Levey AS, Coresh J (2012) Chronic kidney disease. Lancet 379: 165-180.
5. Couser WG, Remuzzi G, Mendis S (2011) The contribution of chronic kidney disease to the global burden of major noncommunicable diseases. Kidney Int 80: 1258-1270.
6. Singh AK, Farag YM, Mittal BV, Subramanian KK, Reddy SR, et al. (2013) Epidemiology and risk factors of chronic kidney disease in India-results from the SEEK (Screening and Early Evaluation of Kidney Disease) study. BMC Nephrology 14: 114-124.
7. Wulandari A, Armenia, Gillani SW (2013) Study of the Risk Factors on the Patients with Kidney Disorders at the Hospital Universiti Sains Malaysia. IPP 1: 39-43.
8. Stack AG, Casserly LF, Cronin CJ, Chernenko T, Cullen W, et al. (2014) Prevalence and variation of Chronic Kidney Disease in the Irish health system: initial findings from the National Kidney Disease Surveillance Programme. BMC Nephrology 15: 185-197.
9. Wijewickrama ES, Weerasinghe D, Sumathipala PS, Horadagoda C, Lanarolle RD, et al. (2011) Epidemiology of chronic kidney disease in a Sri Lankan population: experience of a tertiary care center. Saudi J Kidney Dis Transpl 22: 1289-1293.
10. WHO (2016) Global report on diabetes. World Health Organisation, Geneva.
11. Crews DC, Plantinga LC, Miller E, Saran R, Hedgeman E et al. (2010) Centers for Disease Control and Prevention Chronic Kidney Disease Surveillance Team. Prevalence of Chronic Kidney Disease in Persons with Undiagnosed or prehypertension in the United States. Hypertension. 55: 1102-1109.
12. Farag YM, Kari JA, Singh AK (2012) Chronic kidney disease in the Arab world: a call for action. Nephron Clin Pract 121: 120-123.
13. Huda MN, Alam KS, Rashid HU (2012) Prevalence of Chronic Kidney Disease and Its Association with Risk Factors in Disadvantageous Population. Int J Nephrol 2012: 267329.
14. Iseki K (2008) Chronic kidney disease in Japan from early predictions to current facts. Nephron Clin Pract 110: 268-272.
15. Aitken GR, Roderick PJ, Fraser S, Mindell JS, O'Donoghue D, et al. (2014) Change in prevalence of chronic kidney disease in England over time: comparison of nationally representative cross-sectional surveys from 2003 to 2010. BMJ 4: 1-12.
16. Amoako YA, Laryea DO, Bedu-Addo G, Andoh H, Awuku YA (2014) Clinical and demographic characteristics of chronic kidney disease patients in a tertiary facility in Ghana. Pan Afr Med J 18: 274.
17. Orantes CM, Herrera R, Almaguer M, Brizuela EG, Hernández CE, et al. (2011) Chronic Kidney Disease and Associated Risk Factors in the Bajo Lempa Region of El Salvador: Nefrolempa Study, 2009. MEDICC Rev 13: 14-22.
18. Samuel SM, Foster BJ, Hemmelgarn BR, Nettel-Aguirre A, Crowshoe L, et al. (2012) Incidence and causes of end-stage renal disease among Aboriginal children and young adults. CMAJ 184: 758-764.