

Pattern Study of Clinical Presentations of Patients with Chronic Kidney Disease in Babylon Governorate, Iraq

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ABSTRACT

Introduction: Chronic kidney disease (CKD) is a complicated disease; 10% of the people worldwide are affected by chronic kidney disease (CKD). Progression of CKD is associated with many serious complications, like increased incidence of cardiovascular disease, hyperlipidemia, anemia, and metabolic bone disease.

Aim of study: To describe the pattern of clinical presentation of adults with CKD.

Patients and methods: This study is across a sectional study on 100 patients with CKD who visited the Marjan teaching hospital's emergency department.

Results: males with CKD were more than females (56% and 44% respectively), patients with primary educational level–or lower- represent the majority of the sample (78%) in comparison to the secondary (16%) and tertiary (6%) levels of education. 84% of the sample are on dialysis, and 16% are not. In addition, we found that 50% of the patients with CKD have high blood pressure at the time of presentation, while 24% are elevated blood pressure, 21% are normotensive, and 5% are with low blood pressure. In addition, 2% were hypoglycaemic, 36% were hyperglycaemic, and 62% were significant glycaemic association between multiple complaints and serum blood sugar and potassium, past medical history, and blood pressure.

Conclusion: Most common emergency presentation is shortness of breath. Hypertension is the strongest association with CKD. Uraemia is a usual consequence of CKD. Patients with more than one emergency complaint have the highest blood sugar reading and the highest potassium level, and those kinds of patients should be considered.

Keyword: Babylon Governorate, Chronic kidney disease, Clinical presentation.

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INTRODUCTION

Chronic kidney disease (CKD) is an unusual building and/or task of the kidney. It is most common and mixed with other diseases like diabetes and cardiovascular disease. Acute kidney damage and fatality can occur due to moderate to severe CKD. CKD has no symptoms but can detect it; CKD management can stop and postpone it and decrease its progression and complications, so it cannot be diagnosed easily.¹ CKD has fixed and progress damage for months to years.² Renal failure cause: cold intolerance, problematic urination, faintness, dyspepsia, shortness of breath, edema, Exhaustion, Frothy urine (high protein), Damage of focus, vomiting, pain of upper and lower extremities, pruritus.³

History: most patients with it with no symptoms, so progress in patients not well diagnosed, with most risk factors are hypertension and diabetes, kidney stone or bacterial infection, any previous family history.⁴

Examination: Signs of general kidney illness and excluded another diagnosis, a physical examination must be done searching for hypertension besides Edema:

Investigation: Routine blood test for Blood urea, Serum potassium, Creatinine, Haemoglobin and Estimates of glomerular filtration rate which estimation is based on the abbreviated equation of MDRD:

$$175 \times (\text{Creatinine}/88.4)^{-1.154} \times (\text{Age})^{-0.203} \times (0.742 \text{ if female}) \times (1.210 \text{ if black})^5$$

Urine Tests: Routine kidney function assessment includes the assessment of urine amount and quality. Proteinuria is a prominent finding of prognosis in CKD, and disease severity is often associated with proteinuria levels and persistence over time. Regular proteinuria screening is therefore suggested.⁶

Imaging Technique: Renal US non-penetrating procedure for calculating size and form of renal stone for any obstruction, CKD feature under the US is damage difference between cortex and medulla and high cortex density.⁷

Aim of the Study: describe the patterns of the clinical presentation of ESRD patients in the emergency department to increase awareness about these presentations.

Method

A cross-sectional study involved 100 patients with CKD. our study conducted in Marjan Medical city emergency department and the department of renal dialysis during the time between 1 November 2018 to 1 June 2019. Patients with acute renal diseases are excluded. The information collected included history (age, gender, educational level, symptoms, and past medical history), examination (blood pressure, temperature, and peripheral neuropathy for gloves and stockings paraesthesia by light and painful stimulations) (Table 1). The investigations used for the final diagnosis are blood biochemistry (hemoglobin, random blood sugar, blood urea, serum creatinine, serum potassium). Also, Chest X-ray (for evidence of pleural and pericardial effusion, infections, and cardiac size), abdominal ultrasound (for CKD signs or evidence of congenital anomalies), Echo study (for signs of pulmonary hypertension and pericardial effusion), and ECG, all of which were included in the questionnaire (Figure 1). SPSS version 21 was used for Statistical analysis. Categorical variables are presented as frequencies and percentages. For continuous variables, used T-test and categorical variables using chi-square plus Fisher-exact test, significant P-value was ≤ 0.05 .

RESULTS AND DISCUSSION:

The Distribution of Patients According to Clinical Presentation

Figure 2 shows the percentage of the clinical presentation individually in the patients.

Regarding the clinical presentation of a patient with CKD, we classified these presentations into single and multiple. In our study, we found out that the most common presentation is a combination of complaints and presentations to the emergency ward, which comprise 34% of the cases (34 patients), and those complaints include more than one of the following: shortness of breath, edema, ascites, low urine output, hematemesis, melena, altered mental status, vomiting, cough, fatigue, fever, pallor,

and malaise. Patients with CKD often involvement a varied variety of symptoms as illness development. These symptoms like that occur in old patients and multiple comorbidities usual in geriatrics (Table 2).⁸

The most common single presenting symptom is shortness of breath (SOB) which constitutes 26% of the patients (26 patients). The second one is edema representing 12% of cases (12 patients), followed by ascites and low urine output comprising 6% (6 patients each). The fourth most common presentation is altered mental status, constituting 4% of the case (4 patients). Regarding emergency presentation in the individualized pattern, we found that shortness of breath (dyspnoea) is the most common emergency presentation, which forms 56% of the cases (56 patients). However, its pathophysiology is poorly understood. While hemodialysis may deal with fluid overload, it often does not significantly improve breathlessness, suggesting multiple and co-existing alternative issues exist.⁹

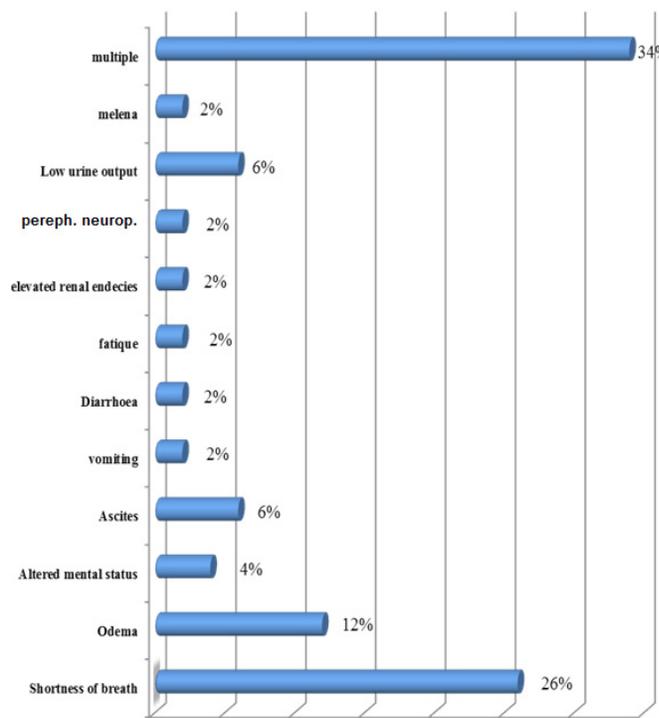


Figure 1: Distribution of patients according to clinical presentation

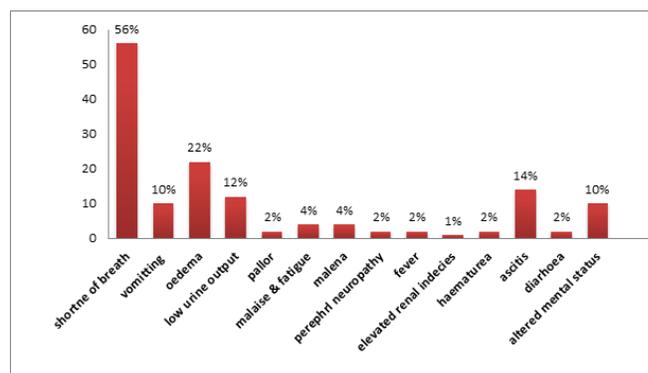


Figure 2: Percentage of the clinical presentation individually in the patients.

Table 1: Distribution of patients according to study variables

Study variables	Number	Percentage (%)
<i>Blood pressure</i>		
Low	5	5.0
Normal	21	21.0
Elevated	24	24.0
High (stage 1 and 2)	50	50.0
Total	100	100.0
<i>Blood sugar</i>		
Hypoglycemia	2	2
Hyperglycemia	36	36
Euglycaemia	62	62
<i>Renal dialysis</i>		
Yes	84	84
No	16	16
Total	100	100.0

In end-stage renal disease, dyspnoea can be due to metabolic acidosis, volume overload causing pulmonary edema, and/or pleural effusions impairing lung expansion.¹⁰ In comparison, research by *Murtigh FE et al.* stated that the mean prevalence of dyspnoea is 35% (11% to 55%) (Table 3). Prevalence variations related to differences in symptom definition, period of prevalence, and level of severity reported.^{11,12}

We also found that edema constitutes 22% of the cases (22 patients), making it the second most common emergency presentation. Edema is due to the excessive loss of renal system function that causes a decrease in sodium separation and unsuitable destruction of tubular absorption, leading to increased volume. In the final stage of CDK, fluid accumulates and leads to hypertension, heart failure, and left ventricular hypertrophy.¹³ The putative causes for the occurrence of nephrogenic ascites include inadequate dialysis and ultrafiltration, poor nutrition, and increased peritoneal membrane permeability in combination with impaired

peritoneal lymphatic reabsorption.¹⁴ In comparison, an article published by *Nayak-Rao et al.* stated that there is Marked center to center variability in the incidence of nephrogenic ascites of 0.7–20%, wide age of onset of 11–71 years (mean 42 years), and male preponderance (male: female = 2:1) has been reported.¹⁵ When GFR decreases, it leads to urine change in patients with CDK, a rounded from oliguria to normal amount of urination to abnormal. So the urine output can be calculated by the difference between GFR and tubular reabsorption and depending on concomitant complications as hypertension or/ and the primary renal diseases.¹⁶ Vomiting, on the other hand, constitutes 10% of the cases (10 patients). Vomiting is very common in kidney patients and has many causes. These causes include the build-up of uremic toxins, medications, gastroparesis, ulcers, gastroesophageal reflux disease, gall bladder disease, and many more.¹⁷

We also found that altered mental status is 10% of the cases (10 patients). CDK patients always had neurological problems and lead to developed encephalopathy (Figure 3).¹⁸ Melena (superior GIT hemorrhage) was 4% of patients (4 cases). CKD is an important cause of gastrointestinal bleeding due to angiodysplastic injuries and esophagitis erosion¹⁹ and sporadic take of heparin during dialysis and uraemia that cause platelet

Table 2: Distribution of patients according to clinical and lab findings

Clinical diagnosis	Number	Percentage (%)
Hyperkalemia	14	14
Hypertensive crisis	2	2
Hypoalbuminemia	6	6
Hypoglycemia	2	2
Hypotension	2	2
Pericardial effusion without tamponade	6	6
Pulmonary hypertension	8	8
Pleural effusion	14	14
Pulmonary edema	4	4
Severe anemia	2	2
Symptomatic heart failure	9	9
Upper gastrointestinal tract bleeding	4	4
Uremic encephalopathy	4	4
*Uremia (non-specific uremic symptoms)	21	21
Urinary tract infection	2	2

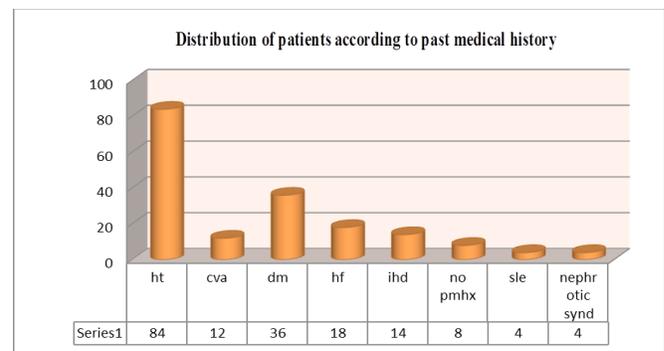


Figure 3: The distribution of the past medical history in the individual pattern. HT=hypertension, CVA=cerebrovascular accidents, DM=Diabetes Mellitus, HF=heart failure, IHD=ischemic heart disease, PMHx=past medical history.

Table 3: The mean differences of study markers

Study variables	Presentation	N	Mean	SD	t-test	P-value
Age (years)	Single complain	66	56.7	14.39	-0.329	0.744
	Multiple complaints	34	57.44	21.89		
HB (g/dL)	Single complain	66	9.14	2.07	-0.837	0.405
	Multiple complaints	34	9.54	2.66		
Blood sugar (mmol/L)	Single complain	66	7.30	2.63	-2.119	0.04*
	Multiple complaints	34	9.30	5.18		
Urea (mmol/L)	Single complain	66	27.61	8.08	0.913	0.366
	Multiple complaints	34	25.75	10.37		
Serum creatinine (mmol/dL)	Single complain	66	477.87	163.77	0.548	0.585
	Multiple complaints	34	457.58	196.59		
Serum potassium (mmol/L)	Single complain	66	4.65	1.31	-3.098	0.003*
	Multiple complaints	34	5.63	1.58		

P value ≤ 0.05 (significant).

Table 4: The Association between clinical presentation and study variables

Study variables	Study group		χ^2	P-value
	Single complain	Multiple complaints		
<i>Gender</i>				
Male	35 (53.0)	21 (61.8)	0.695	0.405
Female	31 (47.0)	13 (38.2)		
Total	66 (100.0)	34 (100.0)		
<i>Educational level</i>				
Primary	50 (75.8)	28 (82.4)	0.324 f	
Secondary	13 (19.7)	3 (8.8)		
Higher education	3 (4.5)	3 (8.8)		
Total	66 (100.0)	34 (100.0)		
<i>Past medical history</i>				
Single disease	27 (40.9)	6 (17.6)	6.63	0.036*
Multiple diseases	33 (50.0)	26 (76.5)		
Negative	6 (9.1)	2 (5.9)		
Total	66 (100.0)	34 (100.0)		
<i>Blood pressure</i>				
Low	5 (7.6)	0 (0.0)	0.025* f	
Normal	10 (15.2)	11 (32.4)		
Elevated	20 (30.3)	4 (11.8)		
High	31 (47.0)	19 (55.9)		
Total	66 (100.0)	34 (100.0)		
<i>Renal dialysis</i>				
Yes	54 (81.8)	30 (88.2)	0.688	0.407
No	12 (18.2)	4 (11.8)		
Total	66 (100.0)	34 (100.0)		
<i>Diagnosis</i>				
Uremia and uremic encephalopathy	13 (19.7)	8 (23.5)	3.98	0.263
Fluid overload	26 (39.4)	7 (20.6)		
Infection	4 (6.1)	4 (11.8)		
Other	23 (34.8)	15 (44.1)		
Total	66 (100.0)	34 (100.0)		

*P-value ≤ 0.05 was significant. F: Fisher-exact

function loss.²⁰ In comparison, a study by Chih-Chia Liang showed that incidence of upper gastrointestinal hemorrhage in stage 3 each 100 patient-years was 3.7 and in patients with stage 4 was 5 while in stage 5 was 13.9.²¹

Some patients claimed fatigue “prevented them from having a normal life.” and many patients are reluctant to report fatigue—even if it is severe—for fear of considered unmotivated or weak.²² The estimated prevalence of fatigue ranges between 42 and 89% according to treatment modality and the instruments used to measure the presence of fatigue.²³ We also found that severe anemia comprises 2% of the cases as a major resenting symptom. Changes related to color include pallor, attributed to severe anemia in which hemoglobin level is 7g/L or less.²⁴ The landmark study by *Obrador et al.* showed that among pre-dialysis patients, 68% of those with advanced CKD had a hematocrit less than 30%, 51%, with 28% hematocrit.²⁵ Prevalence of anemia 5.2% of patients with phase 3 CKD and reach to 44.1% in phase 4.²⁶

Peripheral neuropathy in CKD emergency presentation is 2% (2 patients of our sample). Peripheral neuropathy in CKD is also known as uremic neuropathy. It is the most common neurological complication of CKD. Krishnan AV *et al.* reported that peripheral neuropathy in CKD affects

about 90% of the patients.²⁷ Another resenting feature is fever, which constitutes 2% of the cases (2 patients). There are important causes of fever in CDK patients that no dialysis is an infection, cancer, and connective tissue illnesses. In addition, for patients with dialysis, the cause of infection is catheter use and impairment in the immune system, diabetic and steroid use, and experience systematic dialysis meetings.²⁸ In addition, patients with CDK had diarrhea with multiple causes.²⁹ Patients with ESKD have diarrhea due to *Clostridium difficile* (diarrhea caused by antibiotics) associated with immune impairment and cardiovascular disease (Table 1).³⁰

CONCLUSION

The most common emergency presentation is shortness of breath. Hypertension is the strongest association with CKD. Uraemia is a usual consequence of CKD. Patients with more than one emergency complaint have the highest blood sugar reading and the highest potassium level, and those kinds of patients should be considered.

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