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EXPLORATORY STUDY ABOUT THE ROLE OF KNOWN RISK FACTORS OF RENAL FAILURE AMONG SAUDI POPULATION.

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ABSTRACT

Backgrounds: There have been a marked rise in the prevalence and incidence of renal failure in Saudi Arabia over the last 3 decades. This rise exceeds those reported from many countries. Renal failure patient stay about 15 hours weekly on dialysis machines and Saudi government spend a lot of money on this disease. **Objectives:** This study aim to assess the role of different risk factors associated with renal failure in Saudi Arabia. **Methodology:** Our study is Hospital-based cross sectional study. The sample size was 160 patients collected from Prince Sultan Military Medical City, Riyadh, Saudi Arabia, excluding nationality other than Saudi. We used simple random technique in this study. In this study we used self-administered questionnaire and collect the data by asking the patients. The data were analyzed using SPSS and Microsoft Excel was used to generate figures and charts. Consent was obtained before data collection emphasizing each participant right to withdraw from the study at any point of time. **Results:** the most common risk factor of renal failure is hypertension (38, 8%) and diabetes mellitus (28, 8%). We found that incidence of renal failure increase by the age from 1.9 % to 27.5 % until reach the age group (65 and above) the percentage start to decrease 20.6 % due to increased mortality rate at this group of age. We notice that males got a higher percentage in diabetes while females the highest % in hypertension. we also found that most of patient in low economic class and waiting for kidney donor. The majority of the patients are feeling very weak after dialysis. **Conclusion:** from our study, it is obvious that the most associated risk factors attribute to renal failure are hypertension and diabetes mellitus respectively. As we know this two disease are one of non-communicable diseases in Saudi Arabia, so the future researchers should make research about non- communicable and lifestyle disease and find the relation between these two diseases and other disease.

INTRODUCTION

Renal failure can result from any condition that interferes with kidney function. Acute renal failure occurs when kidney damage is extensive and leads to the accumulation of urea in the blood and to acidosis. In complete renal failure, death can occur in 1-2 weeks. Acute renal failure can result from acute glomerular nephritis, or it can be caused by damage to or blockage of the renal tubules. Some poisons, such as mercuric ions or carbon tetrachloride that are common to certain industrial processes cause necrosis of the nephron epithelium. If the damage doesn't interrupt the basement membrane surrounding the nephrons, extensive regeneration can occur within 2-3 weeks. Severe ischemia associated with circulatory shock resulting from sympathetic vasoconstriction of the renal blood vessels can cause necrosis of the epithelial cells of the nephron. Chronic renal failure results when so many nephrons are permanently damaged that those nephrons remaining functional cannot adequately compensate. Chronic renal failure can result from chronic glomerular nephritis, trauma to the kidneys, absence of kidney tissue caused by congenital abnormalities, or tumors. Urinary tract obstruction by kidney stones, damage resulting from pyelonephritis and severe arteriosclerosis of the renal arteries also cause degeneration of the kidney. In chronic renal failure, the GFR is dramatically reduced, and the kidney is unable to excrete excess excretory products, including electrolytes and metabolic waste products. The accumulation of solutes in the body fluids causeswater retention and edema. Potassium levels in the extracellular fluid are elevated, and acidosis occurs because the distal convoluted tubules and collecting ducts cannot excrete sufficient quantities of potassium and hydrogen ions. Acidosis, elevated potassium levels in the body fluids, and the toxic effects of metabolic waste products cause mental confusion, coma, and finally death when chronic renal failure is severe.[1]

There has been a marked rise in the prevalence and incidence of end stage chronic kidney disease (CKD) in Saudi Arabia over the last 3 decades. This rise exceeds those reported from many countries.[2] The prevalence of (CKD) chronic kidney disease in the young Saudi

population is around 5.7% and Saudi government spends millions outsourcing kidney dialysis.[3]

Cardiovascular disease (CVD), hypertension, diabetes and obesity are increasing in frequency throughout the world and are commonly associated with an increase in the prevalence of (CKD). Recently, high neutrophil gelatinase-associated lipocalin (NGAL) levels have been detected in patients with heart failure, coronary heart disease, or stroke. Evidence for the relationship between renal function impairment and many CVD events was first detected in the dialysis patients in whom the incidence of CVD death is very high. Approximately 50% of individuals with end stage renal disease (ESRD) die from a CVD cause. Diabetes is the leading cause of CKD, 20% to 40% of diabetics will develop diabetic nephropathy during the end stage of their disease therefore, with the increase of cases of diabetic patients, the incidence of CKD is expected to rise. The initial presentation of diabetic kidney disease is microalbuminuria followed by increasing severity of proteinuria as the glomerular filtration membrane is damaged. Hypertension represents a powerful risk factor for CKD and is almost fixedly found in patients with renal failure. Sodium retention and activation of the renin angiotensin system have been regarded as the most effective mechanisms implicated in the rising of blood pressure in patients with CKD. Obesity often coexists with hypertension, which may cause nephropathy. The aim of this study to assess the role of different known risk factors in development of renal failure.[4]

OBJECTIVES

- **GENERAL OBJECTIVES**
  - To assess the role of different risk factors associated with renal failure among Saudi population.

- **SPECIFIC OBJECTIVES**
  - To determine different factors associated with renal failure.
  - To identify the most common factor in Saudi population.
  - To determine relation of different factors associated with age.
  - To determine relation of different factors associated with gender.
  - To identify the most common complication in association with age
  - To identify economic class in relation to renal failure.
  - To identify common complications that troubling the patients.
  - To find the proportion of patient who are waiting for renal transplantation.

Problem statement

Renal failure today is important health issue. treatment with dialysis or kidney transplantation creates a huge financial burden for the majority of the people who need it. many people cannot afford treatment at all, resulting in the death of over 1 million people annually from untreated kidney failure.

Hypothesis

People who were suffering of hypertension have a higher incidence of renal failure.

Literature view

In August 17, 2005, **Australia, Belgium, Brazil,** Canada, China, Germany, Greece, Indonesia, Italy, Japan, the Netherlands, Norway, Russia, Singapore, Spain, United Kingdom, the title of this study was Acute Renal Failure in Critically Ill PatientsAMultinational, Multicenter Study, To determine the period prevalence of ARF in intensive care unit (ICU) patients in multiple countries; to characterize differences in etiology, illness severity, and clinical practice; and to determine the impact of these differences on patient outcomes, 29 269, Fifty-two percent of all ARF patients died in the ICU and another 8% died in the hospital after discharge from the ICU, resulting in the overall hospital mortality of 60.3%; whereas SAPS II predicted mortality was 45.6%. Of patients who survived to hospital discharge, 13.8% required RRT at the time of discharge. The median length of ICU stay was 10 days and the median length of hospital stay was 22 days, In this multinational study, the period prevalence of ARF requiring RRT in the ICU was between 5% and 6% and was associated with a high hospital mortality rate. The epidemiology and outcome of acute renal failure (ARF) in critically ill patients in different regions of the world are not well understood. Although there have been several epidemiological studies of ARF, most are either single center or if multicenter are confined to a single country. The period prevalence and hospital mortality reported in these studies have varied widely (single-center studies: 1%-25%; multicenter studies: 39%-71%) and most studies are not comparable because they used different inclusion criteria. In 1 multinational study14 that collected data for a general severity scoring system and provided further but limited and indirect information about the epidemiology of ARF, more than 90% of participating centers were in Europe or North America.[5]

In 18 January 2006 in Canada, study about ACE-inhibitor use and the long-term risk of renal failure in diabetes, the aim was to assess the long term effect of ACE-inhibitor use on the incidence of end stage renal failure in a large cohort of hypertensive diabetic patients, they perform Cohort study on 6102 diabetic patients who were dispensed an antihypertensive drug, main finding was ACE inhibitors might actually increase this risk, which may possibly contribute to the continued increasing incidence of ESRD owing to diabetes, This study indicates that the use of ACE inhibitors by patients with diabetes does not appear to decrease the long term risk of ESRD. These data, in fact, suggest that this risk may be increased with ACE inhibitors. Whether clinicians should reconsider using these drugs in patients with diabetes to prevent kidney disease is unclear.

Indeed, these drugs have been shown to be highly effective, compared with placebo, at preventing cardiovascular outcomes in this population. On the other hand, long-term studies have shown that they are just as effective as beta-blockers and that the focus of treatment should be on tight blood pressure control. More long-term studies of these major outcomes are needed to justify the extensive use of these drugs for renal protection in patients with diabetes.[6]

In June 20, 2012, Alberta, Canada, the title was Rates of Treated and Untreated Kidney Failure in Older vs Younger Adults, Objective was to determine the extent to which age is associated with the likelihood of treatment of kidney failure, sample size: 1 816 824 adults, main finding: We considered 3 outcomes: all-cause mortality, treated kidney failure (initiation of long-term dialysis), and untreated kidney failure (progression to an eGFR<15 mL/min/1.73 m2 without dialysis treatment or a kidney transplant) All outpatient serum creatinine measurements following the index measure were considered during the study period. The renal outcomes were mutually exclusive. Specifically, patients were classified as having treated kidney failure if they received long-term dialysis treatment or a kidney transplant at any time, irrespective of their eGFR, main conclusion: Rates of untreated kidney failure are significantly higher in older compared with younger individuals, Although patients aged 65 years or older represent the fastest-growing segment of the population initiating long-term dialysis, 1- 3 rates of dialysis initiation peak by age 75 years and decline thereafter.3 Potential explanations for this observation include higher mortality among elderly people with non–dialysis-dependent chronic kidney disease (CKD), markedly reduced progression of CKD in this age group, and increased incidence of untreated kidney failure (that is, the decision not to initiate dialysis) in elderly individuals,[7]

In 1 February 2006 at the nephrology unit in Spain, the title was Risk factors of acute renal failure after liver transplantation, The objective of this study was to determine the risk factors of postoperative acute renal failure (ARF) in orthotopic liver transplantation (OLT), the study reviewed 184 consecutiveorthotopic liver transplantation (OLT), The patients were classified as early postoperative ARF (E-ARF) (first week) and late postoperative ARF (L-ARF) (second to fourth week). The risk factors for E-ARF were: pretransplant ARF (odds ratio (OR)=10.2, P=0.025), S-albumin (OR=0.3, P=0.001), duration of treatment with dopamine (OR=1.6, P=0.001), and grade II-IV dysfunction of the liver graft (OR=5.6, P=0.002). The risk factors for L-ARF were: re-operation (OR=3.1, P=0.013) and bacterial infection (OR=2.9, P=0.017), they conclude that The predicting factors of L-ARF differ from E-ARF and correspond to postoperative causes such as bacterial infection and surgical re-operation.[8]

10 February 2004, Madrid, Spain, the title was Predictive risk factors for chronic renal failure in primary high-grade vesico-ureteric reflux, To evaluate and define the risk factors predictive of chronic renal failure (CRF) in children with severe bilateral primary vesicoureteric reflux (VUR), observed within the first year of life and with a long follow-up, The study comprised 50 patients presenting with grade 3–5 bilateral VUR diagnosed in the first year of life; 12 were suspected prenatally and confirmed shortly after birth, before any urinary tract infection (UTI). The mean (range) follow-up was 6.3 (1–16) years. The variables considered within the first year of life were: gender, prenatal diagnosis with no UTI, number of febrile UTIs, serum creatinine and urea nitrogen levels, metabolic acidosis, proteinuria, 24-h urine output, hypertension, bilateral renal length on ultrasonography and renal scarring on renal scintigraphy. The results were assessed using univariate and multivariate analyses (backward-stepwise multiple regression) of the selected variables, Children with primary bilateral high-grade VUR and a serum creatinine of above 6 mg/L in the first year of life have a significant risk of developing CRF in the long-term. Prenatal diagnosis and postnatal febrile UTI do not modify the outcome for renal function.[9]

In 16 May 2007 at University of California, San Francisco USA, the title of study was Community-based incidence of acute renal failure, the aim of this study was to determining the community-based incidence of non-dialysis requiring and dialysis-requiring ARF in a large, diverse cohort of patients receiving usual medical care and quantify the incidence of non-dialysis and dialysis-requiring ARF among members of a large integrated health care delivery system, the study performed on Random sample of 100 subjects classified as having dialysis-requiring ARF showed that 94 patients did receive dialysis for acutely worsening kidney function. The remaining six cases were either patients receiving maintenance dialysis before hospital admission or patients who did not receive dialysis, the main finding was Both dialysis-requiring and non-dialysis requiring ARFs are becoming more common. So this research underscore the public health importance of ARF, and it concludes that using of serum creatinine measurements to identify cases of non-dialysis requiring ARF resulted in much higher estimates of disease incidence compared with previous studies.[10]

In November 27, California, the title was Diuretics, Mortality, and Nonrecovery of Renal Function in Acute Renal Failure, the aim of this study was to determine whether the use of diuretics is associated with adverse or favorable outcomes in critically ill patients with acute renal failure, 552, Diuretics were used in 326 patients (59%) at the time of nephrology consultation. Patients treated with diuretics on or before the day of consultation were older and more likely to have a historyof acute renal failure With adjustment for relevant covariates and propensity scores, diuretic use was associated with a

significant increase in the risk of death or nonrecoveryof renal function. The risk was magnified when patients who died within the first week following consultation were excluded. The increased risk was borne largely by patients who were relatively unresponsive to diuretics, The use of diuretics in critically ill patients with acute renal failure was associated with an increased risk of death and nonrecovery of renal function. Diuretics are also frequently given during ARF in an effort to "convert" oliguric to nonoliguric ARF, since oliguria has been recognized as a proxy for the severity of ARF and the likelihood of requiring dialysis. We hypothesized that the use of diuretics during ARF would be associated with an increase in mortality, hospital length of stay, and nonrecovery of renal function in critically ill patients with ARF due to either direct effects or indirect effects of delaying dialytic support, JAMA. 2002;288(20):2547-2553.[11]

In December 22, 2006, Winthrop University Hospital, Mineola, N.Y., USA, the title of the study was Risk for Acute Renal Failure in Patients Hospitalized for Decompensated Congestive Heart Failure, The purpose was to study was to describe the incidence of ARF, to ascertain risk factors for its development, and to determine whether ARF impacts hospital outcomes, Review was conducted of 509 hospital medical records of patients hospitalized with a principal diagnosis of CHF, they were find that Most patients had reduced renal function at the time of admission with mean serum creatinine of 1.45 8 0.72 and calculated creatinine clearance of 43.1 ml/min. ARF developed during the hospitalization in 21% of patients, with a peak increase in serum creatinine of 0.5–3.3 mg/dl. Most cases occurred on hospital days 4–6 (69.5% of cases). ARF was associated with increased risk for in-hospital mortality and increased length of hospital stay, they were conclude that ARF is a common complication among patients hospitalized for CHF, and is associated with increased risk for adverse outcomes. Certain clinical characteristics present at the time of admission help identify patients at increased risk.[12]

In 4 January 2011, Massachusetts, the title was Identifying Risk Factors for Renal Failure and Myocardial Infarction Following Colorectal Surgery, The purpose of this study is to identify perioperative factors that predispose patients to an adverse cardiac or renal complication. A total of 339 inpatient records were reviewed. 134 were female (40%) and 205 male (60%). The mean age was 61.96 ± 16.2 years with 39.5% right hemicolectomies, 22.7% sigmoidectomy, 13.9% Left hemicolectomy, 11.5% total abdominal colectomy, and 6.2% for ileocectomy and transverse colectomy. 13.9% had baseline renal insufficiency (Cr > 1.4), 7.1% sustained anastomotic leak, 23.9% required postoperative intubation, 15% sustained postoperative sepsis, 11.2% postoperative MI, and 5% clinically significant acidosis. Excluding patients with an anastomotic leak, postoperative intubation, and sepsis, we found that the need for blood product transfusion was associated with postoperative acute renal failure (OR= 7.15 [2.4–20.7]). Preoperative creatinine > 1.5, limited functional capacity, and preoperative systolic blood pressure < 90 mm Hg were all associated with increased MI rates (OR= 15.7 [3.6–66.8], 9.5 [2.1–42.2], 12.0 [5.523–26.072], and 40.6 [1.7–968], respectively). This study demonstrates that several potentially modifiable preoperative and intraoperative factors exist that predispose patients to postoperative cardiac and renal dysfunction in the absence of major surgical complications.[13]

In Jun 2010, Department of Emergency, Hunan Provincial People's Hospital, Changsha 410002, China, the tittle was Risk factors and outcome of acute renal failure in patients with severe acute pancreatitis, Acute renal failure (ARF) is one of the most common causes of death in patients with severe acute pancreatitis (SAP). Here, we aimed to investigate the risk factors of ARF in patients with SAP, assess the prognosis of patients with SAP and, and seek potential measures to prevent ARF, the sample size is 228 patients, the main finding are The average length of stay at the hospital of the patients with ARF was 57 days (range, 3-146 days), ICU length of stay was 40 days (range, 2-104 days), infected necrosis rate was 38.0%, and the mortality rate was 66.6%. These were significantly higher compared with those of patients without ARF, the main Conclusions (The significant risk factors for ARF in patients with SAP include history of renal disease, hypoxemia, and ACS. Measures that can prevent ARF include homeostasis maintenance, adequate perfusion of the kidneys, adequate oxygenation, and abdominal decompression to avoid ACS.[14]

In September 2011, The University of Manchester, Manchester Academic Health Science Centre, UHSM, Academic Surgery Unit, Education and Research Centre, Southmoor Road, Manchester M23 9LT, UK, the title was What are the Risk Factors for Renal Failure following Open Elective Abdominal Aortic Aneurysm Repair?, Renal failure following abdominal aortic aneurysm (AAA) repair is a common and significant complication. The objective of this study was to identify risk factors for renal failure following open elective AAA repair, the sample size (140 of 2378 patients), the main finding (During the study period 2378 patients underwent open elective AAA repair. A total of 31 patients were excluded due to significant pre-operative renal impairment. Post-operative renal failure occurred in 140 (6.0%) of the 2347 patients included. The median age was 73 (25th and 75th percentiles: 68–73) with the majority of patients being men (81.5%). The overall 30-day mortality rate for the cohort was 6.1%.Patients who developed post-operative renal failure were significantly more likely to die within 30-days of open elective AAA repair with a mortality of 35.0% compared to 4.3% for those without renal failure, the main Conclusions are Renal failure following open elective AAA repair was associated with an increased risk of mortality. Risk factors for post-operative renal failure were dentified and

a simple clinical risk score developed to facilitate focussed care strategies for high-risk patients.[15]

In 2009, in the BajoLempa Region of El Salvador, the title was Chronic Kidney Disease and Associated Risk Factors in the BajoLempa Region ofEl Salvador, the aim is to Identify risk factors for chronic kidney disease and urinary markers of renal and vascular damage, measure kidney function and characterize prevalence of chronic kidney disease in persons aged ≥18 years in the BajoLempa region of El Salvador, the sample size are 343 men, 432 Women, the main finding is Alcohol and tobacco use were much more commonin men than in Women, NSAID and medicinal plant use were very high and higheramong women, The most common NSAIDs used were ibuprofen (44.5%), diclofenac (19.5%), and aspirin (3.4%). Consumption of starfruit was not reported, the main Conclusions In this study population, chronic kidney disease and its chronic renal failure phases had a higher prevalence and a distinct epidemiological and clinical pattern from that reported internationally. The disease predominated in agricultural workers exposed to nontraditional (occupational and toxic factors) and traditional risk factors (DM, HT, obesity and dyslipidemia) for CKD that may act synergistically.[16]

In 25 August 2003, Poland, the title of this study was Risk factors for renal failure in children with non-glomerular nephropathies, the aim of this study was to analyze the progression of chronic renal failure (CRF), the effects of modification of risk factors for disease progression, and to formulate a theoretical model of CRF progression in an unselected group of children with CRF, The study was a cross-sectional, retrospective analysis of 92 patients, the main finding was Causes of primary renal disease in 92 patients were posterior urethral valves (PUV) in 35, reflux nephropathy in 17, diseases other than PUV obstructive nephropathy in 8, hypo/dysplasia in 8, focal segmental glomerulosclerosis in 1, hemolytic uremic syndrome in 5, neurogenic bladder in 11, nephronophthisis and autosomal recessive polycystic kidney disease in 2, and renal mass after subtotal nephrectomy in 5, they conclude that in unselected patients with CRF of nonglomerular origin and nil-to-moderate proteinuria the main risk factors for CRF progression are rapid somatic growth, age, and blood pressure. Arterial hypertension and proteinuria, even of mild intensity, differ significantly between patients with progression of CRF and those with stable or improved renal function. Renoprotective therapy is related to significant slowing of CRF progression, but the risk factors for resistance to therapy include persistent proteinuria and somatic growth.[17]

In November 2007, Denmark, the title was Risk factors for acute renal failure requiring dialysis after surgery for congenital heart disease in children, This cohort study was conducted to examine this subject, as well as changes in the incidence of ARF from 1993 to 2002, the in-hospital mortality and the time spent in the intensive care unit (ICU). A total of 130 children (11.5%) developed ARF after surgery. A young age [≥1.0 vs. <0.1 year; odds ratio (OR), 0.23; 95% confidence interval (CI), 0.12–0.46], high Risk Adjusted Classification of Congenital Heart Surgery (RACHS-1) score (OR, 2.72; 95% CI, 1.66–4.45) and cardiopulmonary bypass (CPB) (<90 min vs. none; OR, 2.68; 95% CI, 1.03–6.96; ≥90 min vs. none; OR, 12.94; 95% CI, 5.46–30.67) were independent risk factors for ARF. The risk of ARF decreased during the study period. Children with ARF spent a significantly longer time in the ICU (2–7 days vs. <2 days, P = 0.002; ≥7 days vs. <2 days, P < 0.001) compared with non-ARF patients, and showed increased in-hospital mortality (20% vs. 5%, P < 0.001). A young age, high RACHS-1 score and CPB were independent risk factors for ARF after surgical procedures for congenital heart disease in children. The risk of ARF decreased during the study period. Children with severe ARF spent a longer time in the ICU, and the mortality in ARF patients was higher than that in non-ARF patients.[18]

In July 2000, Belgium, the title was Acute renal failure in the ICU: risk factors and outcome evaluated by the SOFA score, the aim of this study to describe risk factors for the development of acute renal failure (ARF) in a population of intensive care unit (ICU) patients, and the association of ARF with multiple organ failure (MOF) and outcome using the sequential organ failure assessment (SOFA) score. A total of 1411 patients were studied. 348 (24.7 %) developed ARF, as diagnosed by a serum creatinine of 300 μmol/l (3.5 mg/dl) or more and/or a urine output of less than 500 ml/day. The most important risk factors for the development of ARF present on admission were acute circulatory or respiratory failure; age more than 65 years, presence of infection, past history of chronic heart failure (CHF), lymphoma or leukemia, or cirrhosis. ARF patients developed MOF earlier than non-ARF patients (median 24 vs 48 h after ICU admission, p < 0.05). ARF patients older than 65 years with a past history of CHF or with any organ failure on admission were most likely to develop MOF. ICU mortality was 3 times higher in ARF than in other patients. In ICU patients, the most important risk factors for ARF or mortality from ARF are often present on admission. During the ICU stay, other organ failures (especially cardiovascular) are important risk factors. Oliguric ARF was an independent risk factor for ICU mortality, and infection increased the contribution to mortality by other factors. The severity of circulatory shock was the most important factor influencing outcome in ARF patients.[19]

In 14 May 1998, Rome, Italy, the title of the study was Risk factors for acute renal failure in trauma patients, the objectives of this study were to elucidate the risk factors for the development of acute renal failure (ARF) in severe trauma, the study performed as a cohort of 153 consecutive trauma patients, they find Forty-eight (31%)

patients developed ARE, they conclude that The identified risk factors for post-traumatic acute renal failure may help the provision of future strategies.[20]
In 4 July 2010, Germany, the title was Risk factors for renal insufficiency in children with urethral valves, The aim of this study was to analyze the significance of different prognostic factors in a cohort of young boys with PUV. 42 male patients with PUV were recorded, To study the prognosis of long-term renal outcome, the cohort was divided into two groups: group A, comprising 23 boys who showed a normal estimated glomerular filtration rate (eGFR) (≥90 ml/min/1.73 m2) during the whole observation time with or without kidney damage [maximum National Kidney Foundation Kidney Disease Outcome Quality Initiative (K/DOQI) chronic kidney disease (CKD) stage 1]; group B, comprising 19 boys who reached a mildly decreased eGFR using the Schwartz formula[21] (eGFR), Both groups were analyzed for statistical differences inrenal volume, elevated echogenicity, and pathologic corticomedullary differentiation based on ultrasound, MU, VUR, fUTI findings, need for postnatal ventilation, and increased number of urogenital operations using the Fisher exact test. The odds ratio (OR) together with the 95% confidence interval (95% CI) were also determined. eGFR between the groups was compared at 1 year of age using the Mann–Whitney test. Statistical significance was defined as a P value of ≤0.05.The results of this study demonstrate that patients at risk for developing a declining GFR undergo alterations that can be detected by renal ultrasonography. The data also show that it is possible to detect not only decreased renal volume but also pathologic corticomedullary differentiation and elevated echogenicity by ultrasonography, all of which indicate severe kidney damage.[21]

In 2011, At the Yopougon Teaching Hospital in Abidjan. Title was Risk factors for chronic renal failure in Ivory coast A prospective study of 280 patients.The main aim of this study was to identify the causative factors of CRF in order to elaborate the strategies for its prevention and treatment. Study of 280 patients.Was performed prospectively at the Yopougon Teaching Hos-pital in Abidjan from January 2006 to December 2006. Factors known to cause CRF were investigated in patients and controls. Their prevalence rates were compared with the general population. A total of 280 patients and 113 controls were recruited. The mean age of the patients was 37.88 [+ or -] 13.33 years and that of the controls was 41.5 [+ or -] 9.72 years. Both genders were equally represented. The main causes of CRF were chronic glomerulonephritis (47.48%), with HIV infec-tion accounting for 15% of them, and essential hypertension (HTA) (25%). Essential HTA repre-sented the only factor which, if untreated, inevitably leads to CRF. The occurrence of kidney disease related to HTA is universally appreciated. In western countries, HTA was reported to lead to kidney disease in 2-15% of the cases after five years of evolution. Risk factors for HTA to induce kidney failure are systolic blood pressure >160 mmHg, proteinuria >1 g/day and advanced age. In 1996, renal failure related to HTA was found to be 20-times more frequent in blacks residing in the South East of the USA and seven-times more frequent nation-wide. Furthermore, HTA in blacks occurred ten years earlier, with no nocturnal decrease in values. This value was reported to average 26.1% in Nigeria, [sup][10] as in the present study. Africa, most of the patients cannot afford the treatment of HTA, leading to persisting high blood pressure with a high possibility of kidney injury.[22]

METHODOLOGY

- **Study design**
  - Hospital-based cross sectional study.

- **Study area**
  - Prince Sultan Military Medical City, Riyadh, Saudi Arabia.

- **Time of study**
  - 2017

- **Study population**
  - Renal failure patient in Saudi Arabia

- **Inclusion Criteria**
  - Inpatients that are belong to Prince Sultan Military Medical City.
  - Saudi patients diagnosed with renal failure.

- **Exclusion Criteria**
  - Nationality other than Saudi.
  - Other diagnoses

- **Sample size**
  - 160 patients

- **Sample technique**
  - Purposive simple random.

- **Instrument**
  - Self-administered questionnaire**;** a series of close and open-ended questions directed to patients diagnosed with renal failure.
  - This questionnaire covers mainly different known factors associated with renal failure.
  - The questions will be subjected to a probe test for reliability and validity before date collection.

- **Data collection method**
  - The data will be gathered by an interviewer using a specially designed questionnaire with close and open-ended questions.

- **Data analysis**
  - The data will be analyzed using SPSS version 20 and Microsoft Excel will be used to generate figures and charts.
  - Statistical test: Chi square test with significant level (P-value 0.05).

- **Ethical consideration**
  - Consent will be obtained before data collection emphasizing confidentiality and each participant has the right to withdraw from the study at any point of time.

RESULTS

Table 1: Demographic and general questions.

Variable	number	%
➢ **Gender**		
Male	98	61.3
Female	62	38.8
➢ **Marital status**		
Married	120	75
Single	40	25
➢ **education level**		
Not educated	52	32.5
Primary	11	6.9
Intermediate	25	15.6
Secondary	49	30.6
University	23	14.4
➢ **age**		
18-24	3	1.9
25-34	22	13.8
35-44	20	12.5
45-54	38	23.8
55-64	44	27.5
65 years or older	33	20.6

Sample size (n) = 160

Table (1): Of 200 printed and administered questionnaires, 160 questionnaires were completed., Response rate (80%). Majority of participants were male (61.3%) And female participants were (38.8%) because some of them refuse to give information for us.

The majority of patients about Three quarters (75%) were married and about one third (25%) of them were single.

Most of the patients(32.5%) are not educated and follow wrong lifestyle.

Then about (30.6 %) of patient they reach the secondary level and they don't have enough knowledge about this disease. about 15.6 % reach the intermediate level and 6.9% reach primary school because the data collected from military hospital. about 14.4 % of patient reach the university and have enough information about the disease.

The incidence of renal failure increase by the age from 1.9 % to 27.5 % until reach the age group (65 and above) the percentage little decreased20.6 % due to increased mortality rate at this group of age.

Table 2: Monthly income ?

		Frequency	Percent
Valid	1000-4999	99	61.9
	5000-9999	44	27.5
	10000-19999	13	8.1
	More than 20000	4	2.5
	Total	160	100.0

Sample size (n) = 160

Table (2): of 200 printed and administered questionnaire were completed. Majority of monthly income was between 1000 and 4999 for 99 patients (61.9%), while between 5000 and 9999 for 44 patients (27.5%), 13 patients' monthly income were between 10000 and 19999 (8.1%), and at least more than 20000 for 4 patients (2.5%).

Table 3: Do you have ?

		Frequency	Percent
Valid	Acute renal failure	18	11.3
	Chronic Renal failure	142	88.8
	Total	160	100.0

Sample size (n) = 160

Table (3): of 200 printed and administered questionnaire were completed. Majority of Renal Failure was chronic for 142 patients (88.8%), while Acute Renal Failure was 18 patients (11.3%).

Table 4: Your house is ?

		Frequency	Percent
Valid	Owned villa	90	56.3
	Rented villa	32	20.0
	Owned apartment	11	6.9
	Rented apartment	27	16.9
	Total	160	100.0

Table (4): The collected data showed that majority of patients have owned villa (56.3%), then (20%) are living in ranted villa, while (6.9%) have an owned apartment, but (16.9%) have a ranted villa.

Table 5: How long has it been since you were first diagnosed?

		Frequency	Percent
Valid	< 1 year	35	21.9
	1-3 years	53	33.1
	3-5 years	24	15.0
	5-10 years	28	17.5
	> 10 years	20	12.5
	Total	160	100.0

Table (5): 160 questionnaires out of 200 showed resulted in that majority of patients (33.1%) were first diagnosed between 1 to 3 years, while (21.9%) has been diagnosed for less than 1 year, then (17.5%) were first diagnosed between 5 to 10 years, but only (15%) were diagnosed first time between 3 to 5 years, and (12.5%) of the patients have been firstly diagnosed before more than 10 years.

Table 6: What has resulted in your kidney failure?

		Frequency	Percent
Valid	Diabetes	46	28.8
	Hypertensive Nephropathy	62	38.8
	DRUGS	13	8.1
	Congenital anomalies	19	11.9
	Other	20	12.5
	Total	160	100.0

Table (6): 160 out of 200 questionnaires were completed. Majority of patients (38.8%) they have Hypertensive Nephropathy, while (28.8%) they complain from Diabetes, then (12.5%) were complain from other things in this table, (11, 9%) they have Congenital anomalies, and only (8.1%) used DRUGS.

Table 7: What discomforts/complications are troubling you ?

		Frequency	Percent
Valid	Hard to find proper foods to eat	34	21.3
	Creatinine very high even after dialysis	14	8.8
	Short of breath even after dialysis	22	13.8
	Difficulty in controlling blood glucose	36	22.5
	Others	54	33.8
	Total	160	100.0

Table (7): 160 out of 200 questionnaires were completed. Majority of patients (33.8%) they complain from Others things in this table, while (22.5%) they have Difficulty in controlling blood glucose, then (21.3%) they Hard to find proper foods to eat, (13.8%) of patients Suffering from Short of breath even after dialysis, and only (8.8%) they complain Creatinine very high even after dialysis.

Table 8: What discomforts/complications are troubling you ?.

		Frequency	Percent
Valid	Anemia	24	15.0
	High blood pressure	31	19.4
	Feeling very weak	56	35.0
	Nausea	32	20.0
	others	17	10.6
	Total	160	100.0

Table (8): We printed and administered 200 questionnaires, 160 questionnaires were completed. Majority of patients (35%) they complain from feeling very weak, while (20%) complain from nausea, then (19.4%) complain from High blood pressure but (15%) complain from Anemia and (10.6%) complain from other things.

Table 9: Are you waiting for a kidney donor?

		Frequency	Percent
Valid	Yes	96	60.0
	No	64	40.0
	Total	160	100.0

Table (9): We completed 160 questionnaires out of 200 questionnaires. Majority of patients (60%) they were waiting for a kidney donor, while (40%) they were not waiting for kidney donor.

Table 10: Cross Table between economic Class and Risk Factors.

		monthly income ?				Total
		1000-4999	5000-9999	10000-19999	More than 20000	
What has resulted in your kidney failure?	Diabetes	30 (65.22%)	10 (21.7%)	5 (10.9%)	1 (2.17%)	46
	Hypertensive Nephropathy	41 (66%)	16 (25.8%)	3 (4.83%)	2 (3.22%)	62
	DRUGS	7 (53.84%)	4 (30.76%)	2 (15.38)	0	13
	Congenital anomalies	10 (52.6%)	8 (42.1%)	1 (5.26%)	0	19
	Other	11 (55%)	6 (30%)	2 (10%)	1 (5%)	20
Total		99 (61.87%)	44 (27.5%)	13 (8.12%)	4 (2.5%)	160

P value = 0.8 so not significant

Table (10): Showed that the highest ratio between Hypertension and economic class (Hypertensive in monthly income between1000-4999) while the (Diabetes in monthly income between1000-4999) got the second place.

So here we notice that most common risk factor according to the economic class of renal failure is (Hypertensive & Diabetes).

Table 11: Cross Table between Socioeconomic Class and Risk Factors.

		Your house is ?				Total
		Owned villa	Rented villa	Owned apartment	Rented apartment	
What has resulted in your kidney failure?	Diabetes	28 (60.87%)	9 (19.56%)	3 (6.52%)	6 (13%)	46
	Hypertensive Nephropathy	31 (50%)	18 (29%)	4 (6.45%)	9 (14.5%)	62
	DRUGS	8 (61.5%)	1(7.7%)	1(7.7%)	3(23%)	13
	Congenital anomalies	11(57.9%)	1(5.26%)	1 (5.26%)	6(31.58%)	19
	Other	12 (60%)	3 (15%)	2 (10%)	3 (15%)	20
Total		90 (56.25%)	32 (20%)	11 (6.87%)	27 (16.87%)	160

P value =0.5 so not significant

Table (11): We can see here The most of the sample has owned villa, and the most risk factor is hypertension and most of them has owned villa, followed by diabetes and also the most of them has owned villa.

Table 12: Cross Table Between risk factors and Age

		Your age ?						Total
		18 -24	25-34	35-44	45-54	55-64	65 years or older	
What has resulted in your kidney failure?	Diabetes	0	5	5	10	17	9	46
	Hypertensive Nephropathy	0	3	4	17	19	19	62
	DRUGS	1	1	2	4	3	2	13
	Congenital anomalies	1	8	5	2	2	1	19
	Other	1	5	4	5	3	2	20
Total		3	22	20	38	44	33	160

P value =0.02 so significant

Table (12): According the questionnaires we got. notice that the highest ratio between risk factor and age was (Hypertensive in age of 45-54) while the (diabetes in age of 55-65) got the second place So here we notice that most common risk factor according to the common age of renal failure is (Hypertensive & Diabetes).

Table 13: Cross Table Between Gender And Risk Factors.

		Gender		Total
		Male	Female	
What has resulted in your kidney failure?	Diabetes	33	13	46
	Hypertensive Nephropathy	35	27	62
	DRUGS	8	5	13
	Congenital anomalies	10	9	19
	Other	12	8	20
Total		98	62	160

P value = 0.5 so not significant

Table (13): We notice in this table that males got a higher % in diabetes while females the highest % in nephropathy
Realized in this table that common risk factor in males was diabetes while common in female was nephropathy.

DISCUSSION

From table (6) the most common risk factor of renal failure is hypertension and diabetes, this goes in contrary to study by Ginawi[1], saudi Arabia, Hail.[4] in which other factor apart from HTN count for 75%, this might be attributed to the fact that the study are in two different areas.

From table (8) Majority of patients (35%) they complain from feeling very weak this goes in contrary to study by Gerogianni[1], Athens, Greece[23]., in which Anemia is the most common complication of CKD, this might be attributed to the fact that the study are in two different areas.

From table (12) majority of risk factor were at the age (54-64). this goes in line with Ginawi[1,] Saudi Arabia, Hail.[4] in which they found that the peaks for most risk factors were at middle age 41-55 years, followed by age range 26-40 years.

From table (13) that common risk factor in males was Hypertensive Nephropathy. this goes in line with HAROUN[1], Washington County, Usa.[24] in which they found that the common risk factor in males is Hypertensive Nephropathy.

From table (11) the association between Socioeconomic Class and Risk FactorsAnd this is go in line with Bello AK, United Kingdom. They found the positive the association between Socioeconomic Class and Risk Factor.[25]

From table (9) our results show the most of the patients are waiting for the right donor which go in line with S.Baya, France. In witch they found that most of the patients are waiting for the right donor.[26]

CONCLUSION

This study evaluates different risk factors that attribute in renal failure among a sample in prince sultan military medical city. from our study, it is obvious that the most risk factors attribute to renal failure are hypertension and diabetes mellitus respectively. As we know this two disease are one of non- communicable diseases in Saudi Arabia, so the future researchers should make research about non- communicable and lifestyle disease and find the relation between these two diseases and other disease.

Recommendation

- in further research is should required to identify symptoms, complication and outcome of early CKD.
- prospective cohort studies should be involving a large number of patients, representative of the Saudi papulation.
- should the particular subgroups of age rare and socioeconomic status should be included.
- a particular emphasis should be placed on assessing the significance of early CKD in the elderly population, in whom the significance of a reduced eGFR in unclear.
- should other outcome of interest include the prevalence of complication such as anemia, CKD- MAB, quality of life and less studied parameters such as impact on relationship and capacity to work.

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