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ORIGINAL ARTICLE

Hyperuricemia in Patients with Chronic Renal Failure: A Single Center Study, Pakistan

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ABSTRACT

Introduction: a level of serum uric acid more than or equal to 70 mg/l (420 mol/l) in males and 60 mg/l (360 mol/l) in women is considered hyperuricemia. It has been established in many studies to be a risk factor or a factor in the progression of chronic renal disease. Recent experimental and epidemiological studies link hyperuricemia to chronic kidney disease (ckd), arterial hypertension, and cardiovascular disease, raising the issue of whether medicines are effective in the prevention of renal illness. The goal of this study is to discover whether there is a relationship between chronic renal disease and hyperuricemia.

Methodology: From january 1st to december 1st, 2015, this single-center study was done at the department of nephrology at marcy teaching hospital in peshawar, pakistan (12 months). We included all chronic renal disease patients with associated hyperuricemia who were admitted to a hemodialysis unit.

Results: A total of 72 individuals were included in the study. The prevalence of hyperuricemia was 15.20 percent. The average age of the patients was 35.5 years. The age group of 40 to 60 years old accounted for 54.6 percent of the total. Patients with hypertension accounted for 49% of the total, with diabetes and hypertension being linked in 11% of the cases. In 42.3 percent of patients, renal insufficiency was moderate. In more than 90% of the patients, hyperuricemia was found. Hyperuricemia was statistically linked to profession, age, hematuria, proteinuria, and hypertension. In 85 percent of patients, allopurinol was prescribed as a treatment. More than 12% of patients had an unsatisfactory course of treatment.

Conclusion: Several recent investigations have shown the role of hyperuricemia in chronic renal disease. To determine its true influence on the prevention and treatment of chronic renal disease, randomised study on large sizes must be conducted.

Keyword: A Single Center Study, Hyperuricemia, Chronic Renal Failure

INTRODUCTION

People worldwide are suffering from chronic kidney disease (CKD) [1]. A recent study found that cardiovascular disease is the 12th leading cause of mortality worldwide [2]. In recent years, internationally, the frequency and incidence of this disease have grown dramatically [3]. CKD is a leading cause of mortality and a substantial contributor to decreased life expectancy in young people in Sub-Saharan Africa [3] [4] [5]. The cause of this outbreak is multifaceted. Hyperuricemia is often seen as a side effect. This condition is known as hyperuricemia and is defined as a serum uric acid level more than or equal to 70 mg/l (420 mol/l) in a male and 60 mg/l (360 mol/l) for women.

According to a number of studies, chronic renal disease may be caused or worsened by smoking. Although hyperuricemia is not known to be a risk factor for the development or progression of the CKD, it is impossible to tell for sure. When the glomerular filtration rate (GFR) decreases due to kidney illness, tissue hypoxia or cell lysis may result in hyperuricemia [6–7]. Hyperuricemia is often linked to other risk factors such high blood pressure, diabetes, and cardiovascular disease, making it difficult to establish a direct relationship between hyperuricemia and the onset and progression of CKD. CKD, arterial hypertension, and cardiovascular disease have been linked to hyperuricemia, which raises the issue of whether medicines might be used to reduce hyperuricemia to avoid renal disease [8].

Hyperuricemia is an independent risk factor for the beginning of chronic kidney disease, according to a new Australian study of 21.475 healthy volunteers who were followed for seven years. However, there are limited investigations in Africa on the link between hyperuricemia and renal illness. Chronic renal insufficiency patients have a unique set of epidemiological, clinical, and paraclinical characteristics, and this study is the first to examine how hyperuricemia affects those characteristics for the first time.

MATERIALS AND METHODS

From the first of the year through the first of December of 2015, doctors at the Marcy Teaching Hospital in Peshawar, Pakistan, performed this single-center study (12 months). All patients in the hemodialysis unit with renal failure and hyperuricemia were included in the study. Fact sheets filled out by patients and their families served as the primary means of gathering this data. Patients have given their permission to participate in this study. Patients' socio-demographic data (age, gender, educational attainment, occupation, and family history); anthropometric measures (height, weight, waist circumference, and BMI); dietary habits (smoking, alcoholism, overconsumption of red meat, and sugary beverages); A review of the patients' medical histories and clinical signs on physical examination; a review of their biochemical data (hemograms; serum creatinines; anaemia, uricemia, creatinine clearance; cholesterol balance; blood ionograms; hematuria; proteinuria (positive if >300 mg); and finally, the treatment and prognosis of the patients were analysed.

- When a person's serum uric acid rises beyond 68 mg/l (418-420 moll/l) in males or 60 mg/l (360 mol/l) in women, it is considered to have hyperuricemia.
- The WHO and the Inter-National Obesity Task Force (1996) categorization of nutritional status was used:
- In order to be considered undernourished, a person must have a BMI of less than 18.5 kg/m2.
- Overweight (obesity) is defined as a body mass index (BMI) of 25 kg/m2 or higher; obese was defined as a BMI of 30-34.9 kg/m2; and severe obesity was defined as a BMI of 35-39.9 kg/m2 or higher.
- · A BMI of more than 40 kg/m2 was considered morbidly obese.
- Arterial hypertension: a rise in blood pressure of more than 140 or 90 millimetres of mercury.
- •Smoking was defined as having smoked tobacco in the 30 days before this consultation.
- There was no quantification of the usual intake of alcoholic beverages, sugary drinks, and meat.

The data obtained were analyzed using Excel and SPSS

(Statistical Package for Social Sciences 2.4).

RESULTS

There were 356 CKD patients hospitalised throughout the course of our study, and 72 of those patients had hyperuricemia, which was present at a frequency of 15.20%. A total of 23 dealers (42.6 percent), 14 housewives (25.7 percent), 17 public employees (15.6 percent), 9 drivers (7.2 percent), and 9 soldiers (7.2 percent) were employed, as stated in Table 1. The range of ages was 27 to 90 years, with a median of 32.5 years. There were 53.3 percent of instances with a sex ratio of 3/1 in the age range of 38-58. Each and every one of the patients consumed meat on a daily basis; 200 of them (90.2%) drank sugary beverages; 80 of them (70.3%) drank at least two cups of wine every day; and 56 of them

(a whopping (28.2 percent).

Hypertensive individuals accounted for 53 of these patients' risk factors (49.1 percent).

Thirteen percent of the patients had both diabetes and hypertension, and eight percent of the patients had diabetes (7.4 percent). There were no risk factors found in any of the other 07 cases (30.6). The average BMI was 29.5 12.4, with 39 patients (36.1 percent) being overweight, 28 patients (24.9 percent) being moderately obese, 19 patients (17.6 percent) being severely obese, 8 patients (7.4 percent) being morbidly obese, 9 patients (8.4 percent) having a normal BMI, and 5 patients with moderate undernutrition (4.6 percent). For the waist circumference, there were 68 (62.9%) patients with a measurement larger than 102 cm and 38 patients with a measurement greater than or equal to that of 102 cm (35.2 percent). Two patients had a waist circumference of less than 88 cm, it was discovered (1.8 percent). Urinary acid levels were found to be 65.4 12.8 mg/l on average. Uric acid levels ranged from 70 to 90 mg/l in 64 patients (94%), with hyperuricemia between 70 and 90 mg/l in the other 44 individuals. Table 2 summarises the distribution of our patients by stage of chronic renal failure. On the other hand, moderate chronic renal insufficiency was seen in 43.5% of patients. 5.6% of patients had reached the end of their lives. Sixty-nine percent of patients had severe anaemia, as shown by haemoglobin levels below 8 g/dl. 88.9% (N = 96) of patients had blood creatinine levels higher than 14 mg/l, with 25% having values higher than 80 mg/l. According to univariate analysis, patients between the ages of 40 and 60 (p=0.0000), those between the ages of 60 and 80 (as well as those between the occupations of traders and housewives) have a statistically significant link to hyperuricemia. Allopurinol was prescribed to 83.3 percent of the patients. 88.9% of the time, the trend was in the right direction.

Table 1: Distribution of patients according to occupation

Occupation	n	%		Uremia (mg/l)		p
			<70	70 - 90	>90	
Driver	17	25.9	1	3	5	0.89
Trader	23	42.8	4	6	35	0.05
Functionaries	09	15.7	0	6	12	0.48
Housewife	14	7.5	2	15	10	0.05
Military	9	7.5	0	7	2	0.05
Total	72	100	7	37	64	

Table 2: Distribution of patients according to GFR

GFR (ml/mn)	Patients	Percentage
>90	10	11.1
60 -89	12	08.3
30 - 59	30	43.5
15 - 29	10	31.5
<15	10	05.6
Total	72	100.0

DISCUSSION

During our study period, 72 hyperuricemic patients were included. The total Hyperuricemia was 15.20% of 356 patients. It was better than studies in the Amazon region of Brazil with 5.6% [12] and 5.1% in healthy Spanish male individuals (54), but lower than Russian and hypertensive patient studies (31 percent). The 50-60 age group (54.6%) was the most afflicted, with men predominating (sex ratio = 3). Male sex doubles univariate hyperuricemia risk but quadruples multivariate risk [14]. These findings support Framingham study data indicating greater uric acid levels in males [15]. Estrogens decrease urates in women [16]. Over-55 males and over- 65 females are cardiovascular risk factors [17]. Age increases the risk of stroke and myocardial infarction in males with hyperuricemia [18]. 70.3% of the 72 patients drank. Our findings was better than LON-GO et al20 .'s percent extra univariate risk of hyperuricemia owing to drunkenness [14]. Alcoholism causes gout [19] [20] [21]. Obesity is linked to hyperuricemia. Obesity doubles Congolese hypertensive patients' risk of hyperuricemia [14]. Jean et al. identified a 30% higher incidence of hyperuricemia in obese Congolese Kinshasa patients [14]. Longo-Mbenza et al. discovered a positive and extremely significant connection between body weight and uric acid in a hyperuricemic population [18]. Longo-Mbenza [22] [23] stressed the importance of insulin resistance in the aetiology of cardiovascular illnesses among African blacks as a challenge for African studyers in eliminating chronic noncommunicable diseases. Clausen [24] suggests that its blood biology reflects hyperuricemia and hypertriglyceridemia. In our study, 29.6% of hyperuricemic individuals smoked. Jean et al. showed 67.4% of cigarette users had hyperuricemia [14]. Smokers' risk of hyperuricemia is double that of non-smokers. Longo-Mbenza et al. linked smoking to elevated uric acid levels [18]. Other study demonstrates this significant link [25] [26]. Our patients mostly had large waistlines. High waist circumferences indicate insulin resistance. This positive and substantial connection verifies literature that considers hyperuricemia a component of insulin resistance/metabolic syndrome [26]. In our study, 67 individuals (62%) were hypertensive, and hyperuricemia was linked to hypertension. Hyperuricemia and blood pressure are positively correlated. In Kinshasa patients [18] and other publications [10] [11] [19] [25] [28] [29], Hyperuricemia causes hypertension. This study discusses the consequences of hyperuricemia in EAH [29]. Despite hyperuricemia, no patient got gout [18]. Some gout bouts resolve with normal uric acid levels [30]. Polynesian women have a high frequency of asymptomatic hyperuricemia [31]. Some studies have linked hyperuricemia to a high risk of renal disease [32] [33], although other factors may confound this connection [34]. Hypertension was confusing. Hyperuricemia is an independent hypertension risk factor [35]. Normal-pressure hyperuricemia participants in our study suffered kidney damage. Bellomo et al. showed that each rise of 10 mg/l (59 mol/l) was associated with 23% chance of reduced GFR larger than 2 ml/min/year in healthy normotensive people [12]. A randomised clinical study in hyperuricemic teenagers with hypertension modified the standard design where the cardiovascular drop-risk correlation was due to l Metabolic syndrome includes gout [36]. Decreased GFR was a critical confounding variable, since serum uric acid increase is often linked with nephron transport abnormalities [37]. This study didn't capture preexisting nephropathy, which might explain hyperuricemia. Also, 117 non-diabetic CKD patients (mean GFR 64 39 ml/min/1.73m2) with doubling of creatinine or terminal renal failure needing dialysis did not have a higher uric acid level [38]. In a retrospective investigation of 223 individuals with Ig A nephropathy, hyperuricemia was associated with an elevated risk of chronic

kidney disease development [39]. However, after adjusting for confounding variables, the connection was no longer statistically significant. Nonetheless, uric acid may have an independent role in the development of tubulo-interstitial lesions and renal parenchyma inflammation [40] as in other chronic glomerulopathies [41]. Hyperuricemia may be a consequence of a preexisting kidney disease, however these data highlight uric acid's role in renal illness. 40 individuals in our study, or 59.7%, did not have a pathological history that may explain their hyperuricemia. In comparison to huge multinational cohorts in this subject, our sample was small. In a study of 21,475 healthy Australian volunteers monitored for 7 years, the risk of CKD 3 was 26% greater in those with slightly higher than normal uric acid levels (416 - 526 mol/l or 70 to 90 mg/l). This proves that uric acid causes kidney disease. Thus, allopurinol 100 mg/d improved renal function in 113 individuals in a randomised trial [42].

CONCLUSION

Chronic renal disease and hyperuricemia have long been linked. In our research, 72 individuals with chronic renal disease who were hyperuricemic had no other known causes for their illness. Many people with hypertension have it. For example, men are more susceptible to hyperuricemia since they are more likely to smoke and to consume excessive amounts of alcohol as well as sugary beverages. Hyperuricemia, hypertension, and the profession have been proven to have a statistically significant correlation. Several recent investigations have shown the connection between hyperuricemia and kidney disease. In order to determine whether or if a decrease in uric acid will help prevent or treat this illness, large-scale randomised research are needed.

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