



FREQUENCY OF HYPERURICEMIA IN HYPERTENSIVE PATIENTS: A DESCRIPTIVE CROSS-

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Abstract:

Objectives: To determine the frequency of Hyperuricemia in Hypertensive Patients.

Materials and Methods: This cross-sectional study was conducted at multiple centers including Chaudhry Pervaiz Elahi Institute of Cardiology, Wazirabad and Jinnah Sindh Medical University, Karachi from July, 2023 to December, 2023. A total of 310 patients who met the inclusion criteria were included in the study. A trained phlebotomist collected 5 ml of blood from each patient, which was then sent to the laboratory for analysis of serum uric acid levels. Patients with fasting serum uric acid levels equal to or greater than 7.0 mg/dL were classified as having hyperuricemia.

Results: The mean age of all patients was 52.93 years, with the majority (55.5%) falling within the 56-70 age group. The 41-55 age group accounted for 25.8% of patients, while the 25-40 age group had the lowest representation at 25.8%. Among the total 310 enrolled patients with hypertension, hyperuricemia was observed in 125 (40.3%) individuals. Gender distribution revealed 127 (41.0%) male patients and 183 (59.0%) female patients. Further analysis involved stratifying hyperuricemia by gender and age groups. However, this analysis yielded an insignificant p-value.

Conclusion: The study concluded that hyperuricemia was associated with hypertension. Additionally, it found that in later stages of life, female individuals with hypertension are more susceptible to experiencing hyperuricemia compared to males.

Key words: Hyperuricemia, Hypertensive, Female

INTRODUCTION:

Hypertension stands out as a prominent contributor to mortality and disability on a global scale, with 3.4 million deaths recorded worldwide in 2010 due to its complications. (1) In Pakistan, the prevalence of hypertension was 16.2% among rural populations and 21.6% among urban populations. (2) Uric acid, primarily known as a byproduct of purine metabolism, was initially identified in 1776. (3) It was

isolated from a urinary tract stone by the Swedish chemist Scheele.(4, 5) Hyperuricemia hasn't received adequate attention in developing countries, leading to a lack of sufficient data on the topic from these regions. Hyperuricemia, characterized by elevated levels of uric acid in the blood, is often associated with conditions like gout, kidney stones, and in some cases, metabolic syndrome.(6) In individuals with hypertension, hyperuricemia is a common complication.(7) The presence of hyperuricemia is closely associated with the onset of hypertension (HTN).(8) Hyperuricemia is commonly associated with various health risks and conditions, including ischemic heart disease, stroke, peripheral artery disease, diabetes, and renal failure. The threshold of 6.8 mg/dL at normal body temperature and neutral pH is often used to diagnose hyperuricemia.(9) However, it's essential to note that individual susceptibility to the adverse effects of hyperuricemia can vary, and not everyone with elevated uric acid levels will necessarily develop these conditions. The lack of data on the prevalence of hyperuricemia in Pakistan is indeed a concern, as it impedes efforts to understand the extent of the issue and develop effective strategies for prevention and management. It would be beneficial for researchers, healthcare professionals, and policymakers in Pakistan to prioritize conducting epidemiological studies to determine the prevalence of hyperuricemia in different regions and population groups within the country. By generating robust data on the prevalence of hyperuricemia, Pakistan can better tailor healthcare policies and interventions to address this important public health issue.

Objective:

To determine the frequency of Hyperuricemia in Hypertensive Patients.

MATERIALS AND METHODS:

Study Design: Cross sectional study.

Study setting: Study conducted at multiple centers including Chaudhry Pervaiz Elahi Institute of Cardiology, Wazirabad and Jinnah Sindh Medical University, Karachi

Duration of the study: The study duration was 6 months from (July, 2023 to December, 2023).

Inclusion Criteria:

- Patients with HTN.
- Patients who have undergone percutaneous coronary intervention (PCI) as a treatment for CAD.
- Patients of 25-70 years of age.
- Both gender.

Exclusion Criteria:

- Patients of secondary hypertension.
- Patients with clinical findings of gout or extra articular manifestations of hyperuricemia.
- Patients with severe liver disease, such as cirrhosis.
- Individuals with chronic kidney disease, especially those with advanced stages.
- Patients taking loop and thiazide diuretics.
- Pregnant women

Methods:

This cross sectional study has been conducted at multiple centers including Chaudhry Pervaiz Elahi Institute of Cardiology, Wazirabad and Jinnah Sindh Medical University, Karachi from July, 2023 to December, 2023. An approval was obtained from the hospital's ethical committee. Total of 310 patients who fulfill the inclusion criteria were enrolled. A trained phlebotomist collected 5 ml of blood from each patient and sent it to the laboratory for analysis of serum uric acid levels. Patients with fasting serum uric acid levels equal to or greater than 7.0 mg/dL were considered as having hyperuricemia. A predesign questionere were used to collect data. For statistical analysis we used SPSS Version 25.

RESULTS: The mean age of all the patients was 52.93±12.1 years with most of the patients 172(55.5%) were of 56-70 years, followed by the age group 41-55 years in which there were 80(25.8%) patients and least amount of patients 80(25.8%) were fall in the age group of 25-40 Years. the male and female patients were 127(41.0%) and 183(59.0%) respectively. Among all the enrolled 310 patients HTN, hyperuricemia was seen in 125(40.3%) patients (Table 2 and fig 1). Stratification of Hyperuricemia for gender and age groups were done and it was found that there was insignificant P-value (Table 3).

Table 1: Base line characteristics of patients (n=310)

| | Mean±SD |
|--------------------|------------|
| Age (Years) | 52.93±12.1 |

Table 2:

| Variables | Frequency | Percentage |
|----------------------|-----------|------------|
| Hyperuricemia | | |
| YES | 125 | 40.3 |
| NO | 185 | 59.7 |
| Age Group | | |
| 25-40 Years | 58 | 18.7 |
| 41-55 years | 80 | 25.8 |
| 56-70 years | 172 | 55.5 |
| Gender | | |
| Male | 127 | 41.0 |
| Female | 183 | 59.0 |

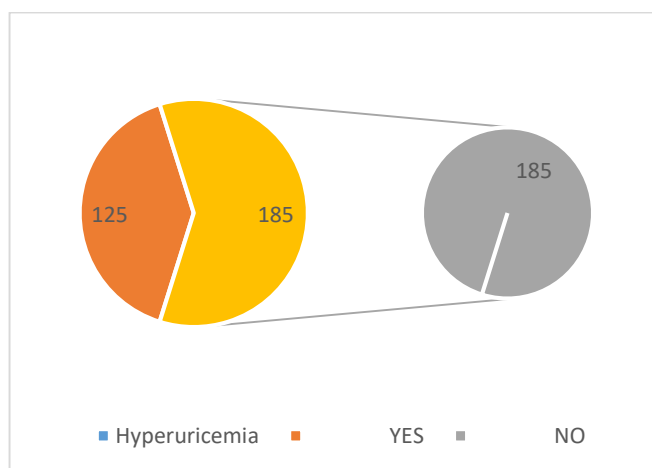


Fig 1: Frequency of Hyperuricemia

Table 3: Stratification of Hyperuricemia for gender and age groups.

| | Hyperuricemia | | P-value |
|---------------|---------------|------------|---------|
| | YES | NO | |
| Gender | | | |
| Male | 61(48.8%) | 66(35.7%) | 0.21 |
| Female | 64(51.2%) | 119(64.3%) | |

| Age groups | | | |
|-------------|-----------|------------|------|
| 25-40 Years | 23(18.4%) | 35(18.9%) | 0.76 |
| 41-55 years | 35(28.0%) | 45(24.3%) | |
| 56-70 years | 67(53.6%) | 105(56.8%) | |

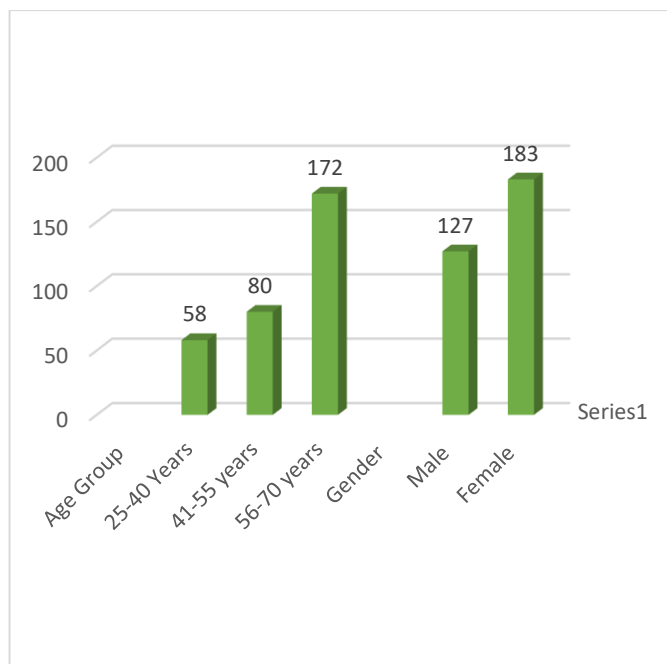


Fig 2: Frequency of age groups and gender

Discussion: Hyperuricemia has been identified as being strongly correlated with hypertension (HTN).(10) Several studies have found a significant association between elevated uric acid levels and the presence of hypertension.(11, 12) While the exact mechanisms underlying this association are not fully understood, it's believed that uric acid may contribute to hypertension through various pathways, including endothelial dysfunction, inflammation, oxidative stress, and alterations in renal function.(13, 14) The main aim of the present study was to determine the frequency of Hyperuricemia in Hypertensive Patients. In the present study we have found the prevalence of hyperuricemia in 125 (40.3%) patients. our study was supported by the study of Muhammad Haroon Bilal et al,(8) in which Hyperuricemia was seen in 150(41.78%) patients. In another Pakistani study conducted in sukkur stated the prevalence of hyperuricemia was 33.3%.(15) In another study conducted by Schmidt et al. found a notably higher prevalence of hyperuricemia among hypertensive individuals (20.1%) compared to non-hypertensive individuals (6.7%).Afifi et al.(16) reported an overall prevalence of hyperuricemia of 55.4% among patients with hypertension, while Rahman et al.(17) found a frequency of 40.3% in hypertensive subjects. Our study's findings align with the results of these afore mentioned studies. The strong correlation between hyperuricemia and hypertension underscores the importance of considering uric acid levels as a potential risk factor in hypertensive patients. Understanding the underlying mechanisms of this association and exploring interventions to address hyperuricemia may have implications for improving hypertension management and reducing cardiovascular risk.

In our study the mean age of all enrolled patients was 52.93 ± 12.1 years. Our study resembles by other studies (8, 18). Hyperuricemia can occur at any age, its frequency tends to increase with advancing age due to the cumulative effects of age-related changes in metabolism, lifestyle factors, comorbidities, and medication use. However, it's essential to note that hyperuricemia can also affect younger individuals, particularly those with specific risk factors or genetic predispositions. Regular monitoring of uric acid levels, especially in older adults or individuals with risk factors, can help identify and manage hyperuricemia early to prevent associated complications such as gout, kidney stones, and cardiovascular disease.

Conclusion: It was concluded that hyperuricemia was associated with Hypertensive. In later stages of life, female individuals with hypertension are more prone to experiencing hyperuricemia compared to their male counterparts.

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