

ORIGINAL ARTICLE

UNLOCKING THE URIC ACID MYSTERY: EXPLORING HIGH LEVELS IN SILENT STRIDES AT LAHORE'S PREMIER HEALTHCARE HUB

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ABSTRACT

Background: Hyperuricemia is an independent risk factor for cardiovascular disease. If these patients are identified and treated for Hyperuricemia, we can prevent cardiovascular complications in these patients. The aim of this study was to find out the prevalence of Hyperuricemia in asymptomatic patients visiting medical outpatient department (OPD).

Materials & Methods: A Descriptive cross sectional study was conducted in Medical OPD of Fatima Memorial Hospital, Lahore. from December 2022 to December 2023 after IRB approval. Total of 200 patients were enrolled in our study and Sampling technique was non-Probability Convenient. Data was entered and analyzed in SPSS version 25.0. Quantitative variables age and BMI expressed as mean \pm SD and qualitative variables diabetes, hypertension, ischemic heart diseases expressed as frequency and percentages. Chi square test was applied for assessing the association of high uric acid levels with comorbidities. P-value <0.05 considered as statistically significant.

Results: In this study mean age was 37 years with standard deviation \pm 2.5, raised uric acid was found in 32 (16%) patients having age of more than 50 years as patients having this age already have other co-morbidities, Regarding Gender distribution having raised uric acid, 33(66%) males had hyperuricemia as compared to females 17(34%).Patients with diabetes were 22(44%) who had hyperuricemia, Hypertensive patients with raised uric acid were 16(32%) Patients with dyslipidemia were 17(34%) with raised uric acid and they were unaware of it. There were 56(28%) patients with ischemic heart disease and out of those 17(34%) had raised uric acid levels. Our 153(76.5%) participants of the study fell in the overweight category as per Asian Standards, out of which 115(76.7%) had raised uric acid, implicating as part of metabolic syndrome.

Conclusion: Hyperuricemia is more common in high weight patients and we need to check the uric acid in patients having other comorbidities as well especially those without having any symptoms.

KEY WORDS: Hyperuricemia; asymptomatic patients; ischemic heart disease; diabetes; hypertension.

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INTRODUCTION

Hyperuricemia refers to raised level of uric acid in blood. Uric acid is a breakdown product of purine metabolism. When uric acid is high >7 mg/dl in males and >6 mg/dl in females¹, it can result in crystal deposits in joints and kidneys leading to gouty arthritis, urate nephropathy and uric acid stones. As per recent updates published in February 2023 and updated in October, 2023 More than 11% population of the united states of America have higher levels of uric acid and this number goes up when it comes to

the rest of the world.²

Hyperuricemia is an independent risk factor for cardiovascular disease. It is not necessary that hyperuricemia be associated with gout, tophaceous deposits, arthritis or renal stones. Sometimes patients have elevated uric acid level for many years and they are unaware of it. If these patients are identified and treated for hyperuricemia, we can prevent cardiovascular complications in these patients. Hyperuricemia is frequently observed in patients having metabolic syndrome.¹ Currently treatment of hyperuricemia in asymptomatic individuals is recommended only in people with gout, arthritis or kidney impairment.³ People with asymptomatic hyperuricemia are vulnerable for developing hypertension, acute and chronic kidney disease, obesity, metabolic syndrome, fatty liver and diabetes mellitus.^{4,5}

A study conducted on Japanese population concluded that the presence of hyperuricemia in healthy, non-obese, normo-glycemic and normotensive have the capability of initiating the inflammatory cascade and thereby leads to enhanced risk of developing the cardio-metabolic diseases.⁶ In Japan, addressing and managing the asymptomatic hyperuricemia above 8 mg/dL is being practiced in true letter and spirit.⁷ A Study Conducted in One of the major tertiary care hospital in Lahore, Pakistan concluded that patients admitted in stroke unit had higher levels of serum uric versus controls with 3.41 times more risk of having hyperuricemia in ischemic stroke patients.⁸ In recent past, study from Karachi Pakistan concluded that frequency of hyperuricemia as 39%⁹

Hence we decided to conduct this study to find out the prevalence of hyperuricemia in asymptomatic patients with other comorbidities as well in our local population so we tried to explore the role of uric acid in igniting the inflammatory cascade in such patients. Patients were considered to have hyperuricemia if they had their Serum uric acid level was >7 mg/dl (430umol/l) for males and >6 mg/dl (360umol/l) for females¹. Patients with high uric acid level but having no pain or swelling in joints and no tophi. Objectives of this study was to find out prevalence of hyperuricemia in asymptomatic patients reporting in Medical OPD of Fatima Memorial Hospital, Lahore.

MATERIALS AND METHODS

It was a descriptive study conducted in Medical OPD of Fatima Memorial Hospital, Lahore from December 2022 – December 2023 and total 200 patients were enrolled in our study and sampling technique was Non-Probability Convenient. Patients with diabetes, hypertension, Obesity and all patients were above 18 years' age were included in our study. patients having gout, rheumatoid arthritis, on anti- hyperuricemic drugs, pregnant females

were excluded from the study. After Approval from Institutional review board (IRB) of the hospital, IRB approval# (FMH-08-2017-IRB-272-M) all patients visiting to medical OPD who gave consent and fulfilled the inclusion criteria were included in the study. Serum the uric acid level was tested and patient's data was recorded on a predesigned Performa.

Data was entered and analyzed in SPSS version 25.0. Chi square test was applied and p value of 0.05 was considered as significant. Quantitative variables age and BMI expressed as mean±SD and qualitative variables diabetes, hypertension, ischemic heart diseases expressed as frequency and percentages. Chi square test was applied for assessing the association of high uric acid levels with comorbidities. P-value <0.05 considered as statistically significant.

RESULTS

There were total of 200 patients, enrolled in our study, out of these 126(67%) were males and 74(37%) were females. The mean age was 37 ±2.5, years and mean body mass Index (BMI) was 25 of ± 1.8 kg/m². Raised uric acid was found in 32 (16%) patients having age of more than 50 years as patients having this age already have other comorbidities, Regarding Gender distribution having raised uric acid, 33(66%) males had hyperuricemia as compared to females 17(34%). Patients with diabetes were 22(44%) who had hyperuricemia, Hypertensive patients with raised uric acid were 16(32%) Patients with dyslipidemia were 17(34%) with raised uric acid and they were unaware of it. There were 56(28%) patients with ischemic heart disease and out of those 17(34%) had raised uric acid levels. Our 153(76.5%) participants of the study fell in the overweight category as per Asian Standards, out of which 115(76.7%) had raised uric acid, implicating as part of metabolic syndrome and the raised uric acid was found in 32 (16%) patients having age of more than 50 years as patients having this age already have other co-morbidities, Regarding Gender distribution having raised uric acid, 33(66%) males had hyperuricemia as compared to females 17(34%). Dealing with patients with other comorbidities, we had total 70(35.2%) patients with diabetes, out of which 22(44%) had hyperuricemia, total of 45(22.5%) patient had hypertension, out of which 16(32%) patients had raised uric acid levels.

Patients who had dyslipidemia, were 55(27.5%), out of which 17(34%) had raised uric acid and they were unaware of it. There were 56(28%) patients with ischemic heart disease and out of those 17(34%) had raised uric acid levels. Our 153(76.5%) participants of the study fell in the overweight category as per Asian Standards, out of which 115(76.7%) had raised uric acid, implicating as part of metabolic syndrome.

Table I: Demographics and Association of Hyperuricemia with Age, Gender and Co-morbidities

Variable	Categories	Serum uric acid (mg/dl)		Total	p-Value
		Normal 150 (75)	Raised 50 (25)		
Age	< 30 years	18(12)	1(2)	19(9.5)	0.0083
	31-50 years	54(36)	17(34)	71(35.5)	
	Above 50 years	78(52)	32(64)	110(55)	
Gender	Male	93(62)	33(66)	126(63)	0.735
	Female	57(38)	17(34)	74(37)	
BMI®	Normal	12(24)	35(23.3)	47(23.5)	0.005
	Overweight	38(76)	115(76.7)	153(76.5)	
DM*	Yes	48(32.2)	22(44)	70(35.20)	0.171
	No	101(57.8)	28(56)	129(64.8)	
HTN€	Yes	29(19.3)	16(32)	45(22.5)	0.078
	No	121(80.7)	34(68)	155(77.5)	
Dyslipidemia	Yes	38(25.3)	17(34)	55(27.5)	0.273
	No	112(74.70)	33(66)	145(72.5)	
IHDΩ	Yes	39(26)	17(34)	56(28)	0.281
	No	111(74)	33(66)	144 (72)	

BMI® =Body mass index, DM*=Diabetes Mellitus, HTN€= Hypertension, IHDΩ= Ischemic heart disease

DISCUSSION

Our study shows prevalence of asymptomatic hyperuricemia general population. We enrolled 63% males and 37% females in this study. Hyperuricemia more common in men 66% than in women 33%. Similar statistics were shown in other studies conducted worldwide. A large Japanese study shows relatively higher levels of serum uric acid in men as compared to women.¹ That is why the normal range of serum uric acid is considered different in males 7.2 mg/dl and females 6.1 mg/dl. On the contrary, in a study conducted in Sukkur, Pakistan, 31.3 % male and 39.3% females were found to be hyperurecemic.⁷ A study conducted in Karachi in 2019 across many clinics showed 39.9% men and 17.9% women were hyperurecemic.³ It is not clear why hyperuricemia is more prevalent in males

The Mean age of patients in our study was 37 years. Among the three groups of patients according to age, hyperuricemia was more prevalent 16% in the higher age group more than 50-year-old. In the Japanese study, mean age was of 47 years. In the study from Karachi, the mean age of subjects was 48.78 ± 13.39 years. Whereas in the study conducted in Sukkur mean age of patients was 56.72 ± 12.24 years. In all these studies, the increasing incidence of hyperuricemia with advancing age is due to the presence of comorbidities like diabetes, hypertension and ischemic heart disease in this age group Mean uric acid level in our study was 5.6mg/dl. Mean Uric acid levels in the study conducted in Sukkur were 6.12 ± 1.68 mg/dl while the mean uric acid level was 5.92 ± 1.73 in the Karachi study.⁸

As the age increases, the number of comorbidities also increases. In our study we brought into account the presence of diabetes 44%, hypertension 32%, dyslipidaemia 34% and ischemic heart disease 34%.

Presence of Comorbidities is a poor prognostic sign and is also a confounding factor in the development of chronic kidney disease (CKD) and cardiac events. The Japanese study removed this confounding factor as they excluded subjects with diabetes, hypertension, hyperlipidaemia and those taking uric acid lowering drugs.⁹

There are certain known Complications of long-standing hyperuricemia. These include gout, ischemic heart disease and increased incidence of stroke. As our study was cross sectional study and subjects were not followed up for development of these complications. A case control study conducted in the same city Lahore which established 3.41 times higher risk of stroke in hyperuricemia patients as compared to controls with normal uric acid level.¹⁰ The large cohort study conducted in Tokyo, Japan¹³ is also different from our study as it followed large number of patients for a period of 5 years for the development of ischemic heart disease and chronic kidney disease. Whereas our study is cross sectional, we did not follow the patients for a long period of time to look for development of complications.

Metabolic syndrome comprises of obesity, high blood pressure, hyperlipidaemia and impaired glucose tolerance. In most of the cases hyperuricemia accompanies metabolic syndrome. In our study we measured BMI of each subject. We discovered that high BMI was associated with hyperuricemia 76.7% as compared to 23% patients with high uric acid level but normal BMI. In the Japanese study the cumulative incidence of overweight/obesity (8.9% vs 3.0%, $p < 0.001$) than normouricemic subjects after five years. The Karachi based study also revealed statistically significant impact of high BMI, hypertension, sedentary lifestyle and increased meat consumption with hyperuricemia.

CONCLUSION

It is very important to start uric acid lowering drugs early along with life style modifications of diet and exercise as hyperuricemia is more common in high weight patients and we need to check the uric acid in patients having other comorbidities as well especially those without having any symptoms.

Limitations & Recommendations: This was a single centre study so results cannot be generalized to the whole population of Pakistan as regional variations do exist and we need to conduct multicentre larger studies with larger sample size to find out the real time data about this important parameter and its implications on various diseases and so the comorbidities.

REFERENCES

1. Du L, Zong Y, Li H. Hyperuricemia and its related diseases: mechanisms and advances in therapy. *Sig Transduct Target Ther*. 2024;9:212. <https://doi.org/10.1038/s41392-024-01916-y>.
2. George C, Leslie SW, Minter DA. Hyperuricemia. 2023 Oct 14. In: *StatPearls* [Internet]. Treasure Island (FL): StatPearls Publishing; 2025 Jan.
3. Jensen T, Abdelmalek MF, Sullivan S, Nadeau KJ, Green M, Roncal C, et al. Fructose and sugar: A major mediator of non-alcoholic fatty liver disease. *J Hepatol*. 2018 May;68(5):1063-75. <https://doi.org/10.1016/j.jhep.2018.01.019>.
4. Johnson RJ, Bakris GL, Borghi C, Chonchol MB, Feldman D, Lanaspá MA, et al. Hyperuricemia, acute and chronic kidney disease, hypertension, and cardiovascular disease: report of a scientific workshop organized by the National Kidney Foundation. *Am J Kidney Dis*. 2018 Jun;71(6):851-65. <https://doi.org/10.1053/j.ajkd.2017.12.009>
5. Kuwabara M, Niwa K, Hisatome I, Nakagawa T, Roncal-Jimenez CA, Andres-Hernando A, et al. Asymptomatic hyperuricemia without comorbidities predicts cardiometabolic diseases: five-year Japanese cohort study. *Hypertension*. 2017 Jun;69(6):1036-44. <https://doi.org/10.1161/HYPERTENSIONAHA.116.08998>
6. Yamanaka H; Japanese Society of Gout and Nucleic Acid Metabolism. Japanese guideline for the management of hyperuricemia and gout: second edition. *Nucleosides Nucleotides Nucleic Acids*. 2011 Dec;30(12):1018-29. <https://doi.org/10.1080/15257770.2011.596496>
7. Fatima T, Iftikhar S, Qureshi IH. Association between hyperuricemia and ischemic stroke: a case-control study. *J Coll Physicians Surg Pak*. 2020 Aug;30(8):853-6. <https://doi.org/10.29271/jcpsp.2020.08.853>
8. Raja S, Kumar A, Aahooja RD, Thakuria U, Ochani S, Shaikat F. Frequency of hyperuricemia and its risk factors in the adult population. *Cureus*. 2019 Mar 6;11(3):e4198. <https://doi.org/10.7759/cureus.4198>
9. Shaikh AA, Altaf A. Prevalence of hyperuricemia in Sukkur, Pakistan: a cross-sectional survey. *Prof Med J*. 2019 Sep 10;26(9):1567-9. <https://doi.org/10.29309/TPMJ/2019.26.09.4027>
10. Neogi T, Mikuls TR. To treat or not to treat (to target) in gout. *Ann Intern Med*. 2017 Jan 3;166(1):71-2. <https://doi.org/10.7326/M16-2401>

CONFLICT OF INTEREST

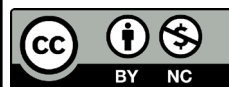
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AUTHORS' CONTRIBUTION

The following authors have made substantial contributions to the manuscript as under:

Conception or Design: AZKC, NU
Acquisition, Analysis or Interpretation of Data: AZKC, NU, SAF, SAHS, MA,
Manuscript Writing & Approval: AZKC, NU, SAF, SS, SQ

All the authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.



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