

Research Article

Association of hyperuricemia with duration of hypertension and gender

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ABSTRACT

Objectives: To evaluate the association of hyperuricemia with duration of hypertension and gender

Material and Methods: This cross sectional study was conducted at Department of Medicine, Civil Hospital, Bahawalpur from March 2017 to September 2017. Total 359 patients of hypertension were selected and association of hyperuricemia with duration of hypertension and gender was assessed.

Results: In present study mean and standard deviation of age cases was 50.91 ± 12.23 years. Out of 359 patients of hypertension, total 150 (41.78%) patients found with Hyperuricemia. Male hypertensive were 154 (42.95) and female hypertensive were 205 (57.10%).

Conclusion: Findings of present study showing a higher rate of hyperuricemia in female hypertensive as compared to male hypertensive. Statistically significant association hyperuricemia with duration of hypertension was noted.

Key words:Hyperuricemia,hypertension,urinary tract stone, diabetes mellitus.

INTRODUCTION

Uric acid, which serves no biochemical function other than being an end product of purine metabolism, was first discovered in 1776.¹ A Swedish chemist Scheele isolated it from a urinary tract stone.²

In hypertensive patients, hyperuricemia is one of the common complication. The existence of the hyperuricemia is closely correlated with the initiation of hypertension (HTN).³ In addition, the hypertension is known to increase the rate of hyperuricemia.

It has been recognized recently that hyperuricemia is also a risk factor for development of cardiovascular events in HTN.⁴ Therefore, the control of hyperuricemia might be critical for management of HTN. Although the diuretics are very important for the management of chronic heart failure and HTN, it is reported to induce the hyperuricemia. Therefore, the careful and

combination treatment for diuretics can be necessary to prevent the treatment-induced hyperuricemia. In the management of HTN, especially with hyperuricemia, it might be very important to select the drug, which does not influence or reduce the concentration of uric acid.⁴ Our study was conducted to determine the frequency of hyperuricemia in them which guide us in the management of hypertension.

MATERIAL AND METHODS

This cross sectional study was conducted at Department of Medicine, Civil Hospital, Bahawalpur from March 2017 to September 2017. Total 359 patients with HTN both male and female with age range from 30 to 70 years were included in this study. Patients of secondary hypertension, patients with clinical Findings of gout or extra-articular manifestations of hyperuricemia, patients

with renal disease and patients taking loop and thiazide diuretics were excluded from the study. Permission was taken from the institutional review committee before starting the study. Written informed consent was taken from every patient.

Five ml fasting blood sample was taken from every patient. Sample was sent to laboratory for serum uric acid analysis. The entire test was run on fully automated chemistry analyzer selectra E & all levels was measured in mg/dl. Patients with fasting serum uric acid ≥ 7.0 mg/dL was labeled as patient of hyperuricemia. All the data with Demographic profile was record in pre designed profroma.

Data was entered in SPSS version 16 and analyzed. The quantitative variables of the study i.e. age and duration of hypertension was presented as Mean(\pm SD). The qualitative variables like gender and frequency of hyperuricemia was presented as frequency and percentages. Pie chart was drawn for frequency of hyperuricemia. Stratification was done for age, gender and duration of hypertension to see the effect of these on outcome variable. Post stratification chi-square test was applied. P.value ≤ 0.05 was considered as significance.

RESULTS

Total 359 hypertensive patients was included in this cross sectional study. Mean age of the

hypertensive patients was 50.91 (\pm 12.28) years, mean duration of hypertension was 18.84 (\pm 9.9) years. Among the 359 patients HTN, hyperuricemia was seen in 150 (41.78%) patients. (Fig. 1) Stratification for age was done and two groups was made, age group 30-55 years and age group 56-70 years. In age group 30-55 years, out of 219 (61%) patients, hyperuricemia was seen in 96 (43.84%) patients. In age group 56-70 years out of 140 (39%) hyperuricemia was seen in 54 (38.57%) patients. No association was found between age and hyperuricemia p. value 0.380. (Table 1). As shown in table 2, out of 154 (42.95%) male patients, hyperuricemia was seen in 45 (29.22%) patients. Among the 205 (57.10%) hypertensive female patients, hyperuricemia was seen in 105 (51.22%). Highly significant association was seen between gender and hyperuricemia. P. value 0.000. Minimum duration of hypertension among the hypertensive patients 1 year and maximum duration was 41 years. Two groups was made for duration of hypertension, 1-20 years and 21-41 years. Among the 155 (43.18%) patients with 1-20 years duration of hypertension, hyperuricemia was seen in 50 (32.26%) patients. Out of 204 (56.82%) patients with 21-41 years duration, hyperuricemia was seen in 100 (49%) patients. Significant association was seen between duration of disease and hyperuricemia. P. value 0.002. (Table 3).

Fig. 1: Frequency for hyperuricemia

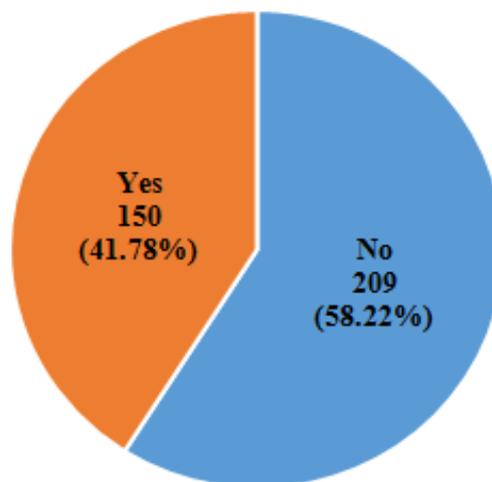


Table 1: Stratification for age

Age	Hyperuricemia		Total	P. value
	Yes (%)	No (%)		
30-55 Years	96 (43.84)	123 (56.16)	219 (61)	0.380
56-70 Years	54 (38.57)	86 (61.43)	140 (39)	
Total	150 (41.78)	209 (58.22)	359	

Table 2: Stratification for gender

Gender	Hyperuricemia		Total	P. value
	Yes (%)	No (%)		
Male	45 (29.22)	109 (70.78)	154 (42.9)	0.000
Female	105 (51.22)	100 (48.78)	205 (57.10)	
Total	150 (41.78)	209 (58.22)	359	

Table 3: Stratification for duration of hypertension

Duration of hypertension (Years)	Hyperuricemia		Total	P. value
	Yes (%)	No (%)		
1-20	50 (32.26)	105 (67.74)	155 (43.18)	0.002
21-41	100 (49)	104 (51)	204 (56.82)	
Total	150 (41.78)	209 (58.22)	359	

DISCUSSION

Hyperuricemia is known to be strongly correlated with HTN.⁵ Mechanism by which uric acid plays a pathogenic role in HTN is not fully clear but it includes reduction of endothelial nitric oxide and stimulation of renin expression.⁶Hyperuricemia is associated with deleterious effects on endothelial function, platelet aggregation and adhesion, in

addition to oxidative metabolism.⁷ HTN also exerts mechanisms that perpetuate hyperuricemia. HTN reduces renal blood flow which stimulates urate reabsorption, micro vascular (capillary) tissue ischemia leads to increased production of lactates which blocks urate secretion in the proximal tubules, ischemia, also, increases the production of xanthine oxidase and increases

purine breakdown leading to increased urate production and more hyperuricemia.⁸

In our study mean age of the patients was 50.91 (\pm 12.28) years, mean duration of hypertension was 18.84 (\pm 9.9) years, these values are comparable with the study of Ahmed et al.⁹

In our study hyperuricemia is more common in female patients as compare to male patients.

In our study 41.78% were hyperurecemic among the hypertensive patients. In one study of Ahmed et al, hyperuricemia was seen in 37.4% patients with HTN.⁹ Findings of this study is also comparable with our study. Schmidt et al reported that hyperuricemia was found more frequently in hypertensive patients (20.1%) than in non-hypertensive patients (6.7%).¹⁰ These findings are in contrast with our study. In one study by Afifi et al, it was found that the overall prevalence of hyperuricemia was 55.4% in patients with HTN.¹¹ Rahman et al found frequency of hyperuricemia in hypertensive subjects was 40.3%.¹² results of our study are in agreement with the results of above mentioned studies.

Poudel et al observed that 28.8% of patients had hyperuricemia with hypertension.¹³ In one study by Kashem et al hyperuricemia was found in 25.4% patients of hypertension.¹⁴ Sachdev et al found 13.5% hyperuricemic in cases of hypertension.¹⁵ These findings are in contrast with our study. In present study insignificant association of age with hyperurecemia was seen but in a study by Afifi A et al, it was found that uric acid significantly associated with advancing of the age of hypertensive patients. ($p < 0.05$)¹¹

CONCLUSION

Female hypertensive are more victim of hyperuricemia as compare to male hypertensive in early or older age equally. Duration of hypertension is significantly associated with raised serum uric acid.

REFERENCES

1. Rock KL, Kataoka H, Lai J-J. Uric acid as a danger signal in gout and its comorbidities. *Nat Rev Rheumatol*. 2013 Jan;9(1):13–23.
2. Bobulescu IA, Moe OW. Renal transport of uric acid: evolving concepts and uncertainties. *Adv Chronic Kidney Dis*. 2012 Nov;19(6):358–71.
3. Tatsuno I, Saito Y. [Hyperuricemia in hypertension]. *Nippon Rinsho*. 2001 May;59(5):967–72.
4. Ito H, Antoku S, Furusho M, Shinozaki M, Abe M, Mifune M, et al. The Prevalence of the Risk Factors for Atherosclerosis among Type 2 Diabetic Patients Is Greater in the Progressive Stages of Chronic Kidney Disease. *Nephron Extra*. 2013 Jul 12;3(1):66–72.
5. Cannon PJ, Stason WB, Demartini FE, Sommers SC, Laragh JH. Hyperuricemia in primary and renal hypertension. *N Engl J Med*. 1966 Sep 1;275(9):457–64.
6. Johnson RJ, Feig DI, Herrera-Acosta J, Kang D-H. Resurrection of uric acid as a causal risk factor in essential hypertension. *Hypertension*. 2005 Jan;45(1):18–20.
7. Fang J, Alderman MH. Serum uric acid and cardiovascular mortality the NHANES I epidemiologic follow-up study, 1971-1992. *National Health and Nutrition Examination Survey*. *JAMA*. 2000 May 10;283(18):2404–10.
8. Johnson RJ, Kang D-H, Feig D, Kivlighn S, Kanellis J, Watanabe S, et al. Is there a pathogenetic role for uric acid in hypertension and cardiovascular and renal disease? *Hypertension*. 2003 Jun;41(6):1183–90.
9. Ahmed N, Anwar W, Waqas H. Obesity, hyperlipidemia, and hyperuricemia in young and old hypertensive patients. *J Ayub Med Coll Abbottabad*. 2009;21(4):53–6.
10. Schmidt MI, Watson RL, Duncan BB, Metcalf P, Brancati FL, Sharrett AR, et al. Clustering of dyslipidemia, hyperuricemia, diabetes, and hypertension and its association with fasting insulin and central and overall obesity in a general population. *Atherosclerosis Risk in Communities Study Investigators*. *Metab Clin Exp*. 1996 Jun;45(6):699–706.

11. Afifi A, Sarhan I, El Sharkawy M, Kamel M, Anwar W, Helmy N, et al. Uric Acid Metabolism in a Sample of Egyptian Hypertensive Patients With Normal Kidney Function. *Egyptian Journal of Hospital Medicine* [Internet]. 2013 [cited 2014 Feb 25];52.
12. Rehman A, Sattar A, Abaidullah S, Hassan M. Evaluation of Cardiovascular Risk Factors in Patients with Essential Hypertension. *Ann King Edward Med Coll* 1999;5:134–7.
13. Poudel B, Yadav BK, Kumar A, Jha B, Raut KB. Serum uric acid level in newly diagnosed essential hypertension in a Nepalese population: A hospital based cross sectional study. *Asian Pacific Journal of Tropical Biomedicine*. 2014 Jan;4(1):59–64.
14. Kashem MA, Hossain MZ, Ayaz KMF, Alam MB, Khan MH, Alam A, et al. Relation of Serum Uric Acid Level And Essential Hypertension Among Patients Without Metabolic Syndrome. *Journal of Dhaka Medical College*. 2011;20(1):5–8.
15. Sachdev B. Prevalence of Hyperuricemia and Its Relation with Metabolic Syndrome in A Select Nomad Tribal Populations of Rajasthan, India. [cited 2014 Jun 12]; Available from: http://ijhsr.org/current_PDF4/5.pdf