



STUDY OF SERUM URIC ACID & VITAMIN-D LEVEL IN HYPERTENSIVE PATIENT

Medical Science

Dr. Nikhil Yadav

Dr. Aishwarya
YadavDr. Vandana
Kumari

Asso. Prof.

Dr. Animesh Deb

Prof.

ABSTRACT

Hypertension remains a significant public health concern globally due to its association with various cardiovascular diseases and mortality risks. Recent research has increasingly focused on exploring potential biomarkers associated with hypertension to better understand its pathophysiology and improve management strategies. Among these biomarkers, serum uric acid (SUA) and vitamin D have emerged as intriguing candidates due to their potential roles in blood pressure regulation and cardiovascular health. Elevated uric acid concentrations are commonly observed in patients with Obesity, hypertriglyceridemia, hypertension and chronic kidney disease[1,2]. Of note, hyperuricemia has been associated with an increased risk for incident hypertension independent of traditional hypertension risk factors[1]. Strong evidence for a causal relationship between elevated uric acid plasma levels and hypertension has been provided by earlier research of Feig and Johnson[3,4]. Vitamin D plays a key role in regulation of blood pressure and in the pathogenesis of hypertension through its effects on calcium homeostasis, vascular smooth muscle, endothelial cells and activity of renin- angiotensin- aldosterone system[5]. Due to the continued interest and lack of information on serum uric acid levels as well as vitamin D levels and the risk of hypertension, this study was conducted to examine serum uric acid and vitamin D level in patients with hypertension and their role in etio-pathogenesis of hypertension.

KEYWORDS

Hypertension, serum uric acid, vitamin D

MATERIALS & METHODS:

A cross-sectional observational hospital based study was conducted after fulfilling all the inclusion and exclusion criteria of the study at the Department of General Medicine, Bihar. The cases include 135 adult individuals (25 years and above) diagnosed with hypertension, attending medicine OPD were taken and 135 healthy normotensive individuals without a history of hypertension came for routine checkup were selected as the control group in the study. All cases were re-categorised into Stage-I and Stage-II hypertension according to JNC (VIII) criteria. Total study duration was 16 months. This study was conducted after approval from institutional thesis and ethical committee.

Inclusion Criteria:

1. Adult individuals aged 25 years and above.
2. Diagnosed cases of hypertension for the hypertensive group.
3. Normotensive individuals without a history of hypertension for the control group. All patients will be re-categorised into Stage-I and Stage-II hypertension according to JNC (VIII) criteria.
4. Participants willing to provide informed consent.

Exclusion Criteria:

1. Individuals with known kidney disease or renal impairment.
2. Those with a history of gout or hyperuricemia
3. Individuals on medications affecting serum uric acid or vitamin D levels.
4. Pregnant or lactating women.
5. Individuals with known malabsorption disorders affecting vitamin D absorption.

RESULT:

1. In case group 51-60 years and in control group 21-30 years was the commonest age group involving 37% and 26.7% patients respectively. The mean age in case and control was 52.96 years and 41.94 years respectively with no significant difference between two groups (p value =0.407). Majority of the patients (51.8%) belonged to stage-I while 36.3% belonged to stage II and 11.9% belonged to elevated hypertension group.

2. The mean systolic blood pressure in elevated hypertension, stage I and stage II was 133.33±2.58 mm of Hg, 150.720±6.31 mm of Hg and 171.789±8.99 mm of Hg respectively.

3. Majority of the patients (66.6%) had a history of hypertension for < 5

years while 33.4% patients had hypertension for > 5 years.

4. The mean SBP level in case and control group was 156.640±14.94 mm of Hg and 114.740±3.22 mm of Hg respectively with statistically significant difference (p value <0.001). The mean DBP level in case and control group was 92.340±9.75mm of Hg and 71.400±4.04 mm of Hg respectively with statistically significant difference (p value <0.001).

5. SGOT & SGPT were increased and among electrolytes Na⁺ was significantly increased & K⁺ was significantly decreased in case group compared to control (p value= 0.04 and 0.002 respectively). The remaining parameters showed no significant difference between two groups.

6. In the study there is statistically positive correlation between serum uric acid level and Systolic blood pressure in cases (R = 0.905, p = <0.001) and there is statistically significant positive correlation between serum uric acid level and Diastolic blood pressure in cases (R=0.856, p=<0.001).

7. There is statistically negative correlation between Vitamin D level and Systolic blood pressure in cases (R= -0.712, p = <0.001) and there is negative correlation between Vitamin D level and Diastolic blood pressure in cases group (R= -0.588 and p<0.001).

8. We found that Uric acid was significantly increased & Vitamin-D level was significantly decreased in cases as compared to control (p value=0.04 and <0.001 respectively).

CONCLUSION:

Serum uric acid is significantly elevated in hypertensives as compared to normotensive individuals and thus, can be used as an early biochemical marker for aiding the diagnosis and severity of hypertension as stage 2 hypertensive had more elevation in serum uric acid levels as compared to other hypertensive.

Vitamin D deficiency may be included as a contributor for hypertension. So, it is advisable for all cases of essential hypertension to have routine checkup of serum uric acid and Vitamin D and treat the condition along with usual treatment of hypertension

REFERENCES:

1. Feig DI, Kang DH, Johnson RJ. Uric acid and cardiovascular risk. *N Engl J Med* 2008;

- 359:1811-1821.
2. Grayson PC, Kim SY, Lavalley M, Choi HK. Hyperuricemia and incident hypertension: a systematic review and meta-analysis. *Arthritis Care Res (Hoboken)* 2011; 63:102-110
 3. Feig DI, Johnson RJ. Hyperuricemia in childhood primary hypertension. *Hypertension* 2003; 42:247-252
 4. Feig DI, Soletsky B, Johnson RJ. Effect of allopurinol on blood pressure of adolescents with newly diagnosed essential hypertension: a randomized trial. *JAMA* 2008; 300:924-932.
 5. Lu wang. Vitamin and Hypertension. *NAJ Med. Sci.* 2009; 2(4):115- 149.