

A comparative study of Serum Uric acid levels among Vegetarians and Non Vegetarians

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Abstract:

Introduction: High Uric acid levels are Associated with development of Many disorders like Gouty Arthritis , Chronic Kidney Disease , Cardiovascular Diseases with increased morbidity. Increased dietary Purines is important cause of hyperuricemia. Animal sources have more uric acid content. So aim of our study is to measure the levels of Uric acid in vegetarians and nonvegetarians to know the impact of diet on Serum uric acid levels.**Materials and methods:** Study included 100 participants . Divided into two groups based on their diet. Study group I included 50 participants , 25 each of male and female in the age group of 30-50 yrs who are consuming vegetarian purine rich food atleast 3 times in a week. Study group II included 50 participants , 25 each of female and male of same age group who are consuming non vegetarian diet .Serum uric acid is measured and compared between the two groups .**Results:** Mean serum uric acid level in study group I is 4.61 ± 1.21 and that in study group II is 5.07 ± 1.06 . Mean serum uric acid levels in Study Group II (Non Vegetarians) when compared to Study Group I (Vegetarians) is higher and is statistically significant ($p < .01$)**Conclusion:** Serum Uric acid levels are more in Nonvegetarians than in Vegetarians which is statistically significant . This shows dietary modifications can regulate Serum uric acid levels preventing the development of Gouty Arthritis and other Metabolic Disorders.

Keywords: Uric Acid, Vegetarians , Non vegetarians.

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I. Introduction

Uric Acid is generated from the catabolism of Purine nucleotides which are derived from DNA & RNA breakdown¹. High Uric acid levels in serum leads to development of Gouty Arthritis , (1)[UA-3], Chronic kidney Disease^{2,3}, Cardiovascular disease^{3,4} and Cancer^{5,6,7}. Causes for Hyperuricemia include decreased excretion through kidneys , increased production due to excess of purine precursors from increased cell turnover or due to increase of dietary purines¹

Animal food like Meat and Fish are rich in purines^{8,9,10} and plant food like beans , cabbage, peas , lentils, mushrooms and Cauliflower are rich in purines. Hippocrates more than 2000 years ago described gout as a disease of kings because it was wealthy who could afford to eat Meat and Fish . Few studies have compared Uric acid concentrations among vegetarians and meat eaters observed a lower serum uric acid level in vegetarians^{11,12,13}

So aim of our study is to compare the levels of Serum Uric acid among Vegetarians consuming purine rich foods and Non Vegetarians consuming Meat . To see if there is any influence of diet in regulation of the concentration of Serum Uric acid , So that dietary advice can be given to patients suffering from hyperuricemia.

II. Materials and Methods

Study is conducted in a Gated community in Hyderabad. Hundred individuals in the age group of 30-50 yrs of both genders were included in the study. Fifty (50) individuals who are consuming vegetarian diet since childhood formed the study group I . 25 are Females and 25 are Males.. Fifty (50) individuals who are taking meat atleast 3 times in a week since childhood formed the Study group-II. In study group II 25 are females and 25 are males.

Inclusion criteria:

- 1) Individuals on vegetarian diet comprising purine rich foods like Mushrooms, beans, peas, lentils consumed atleast 3 times in a week formed the Study group I.
- 2) Individuals on Non Vegetarian diet consuming meat atleast 3 times in a week formed the study group II.
- 3) Equal number of Males and Females are included in each Study Group (25 Number each)

4) Both the groups included individuals with normal intake of dairy products.

Exclusion criteria:

- 1) Individuals consuming Alcohol
- 2) Individuals with chronic renal failure / Diabetes Mellitus/Cancer /Gout
- 3) Individuals on Diuretics
- 4) Those who are suffering from chronic inflammatory diseases like Ulcerative Colitis, Arthritis and Peptic ulcer
- 5) In study Group II individuals who are consuming purine rich vegetarian food are excluded.

After taking due consent , 5ml of venous blood sample is collected from the participants . Serum uric acid is measured by Uricase method in Beckmans fully automated analyser .

Mean values are compared using SSPS statistical software. Statistical comparison is done by Student t test and P value ≤ 0.05 is considered for statistical significance.

III. Results

Serum Uric acid levels are measured in both the study groups . Mean serum uric acid level in study group I is 4.61 ± 1.21 and that in study group II is 5.07 ± 1.06 .Mean serum uric acid levels in Study Group II (Non Vegetarians) when compared to Study Group I (Vegetarians) is higher and is statistically significant ($p < 0.05$) (Table-1)

Parameter	Study Group I N=50	Study Group II N=50	t value	P value
Serum Uric Acid (mg/dl)	4.61 ± 1.21	5.07 ± 1.06	-2.139	0.034*

Table-1 (Fig-1)Comparing Mean Serum uric acid levels among all the participants between Vegetarians and Non vegetarians (* $p < 0.05$)

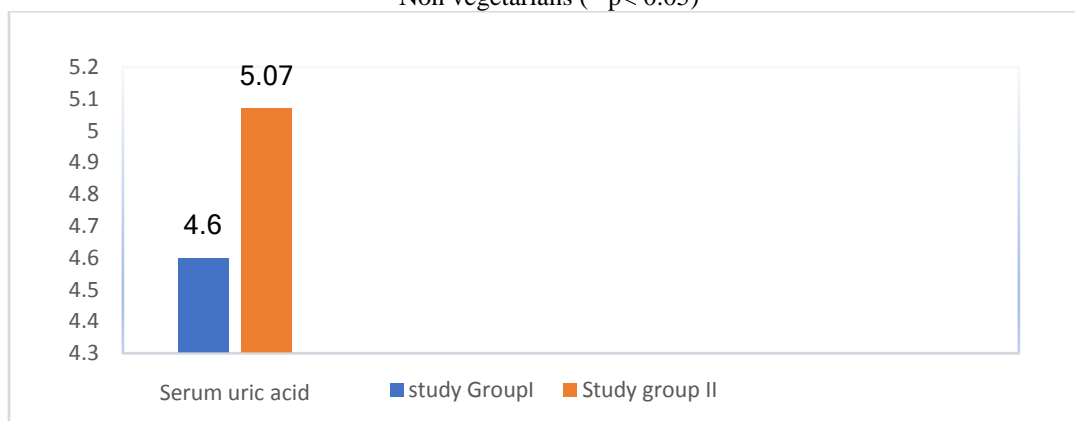


Fig-1)Comparing Mean Serum uric acid levels among all the participants between Vegetarians and Non vegetarians (* $p < 0.05$)

Serum Uric acid levels are compared between males and females in the two study groups .

Mean Serum uric acid levels in females in Study group I was 3.78 ± 0.69 . Mean Serum Uric acid levels in females in study group II was 4.27 ± 0.37 . The value in Non vegetarians is more , it is statistically significant . (Table-2)

Parameter	Study Group I N=25 (Females)	Study Group II N=25 (Females)	t value	P value
Serum Uric Acid (mg/dl)	3.78 ± 0.69	4.27 ± 0.37	-2.37	0.02*

Table-2 Comparison of Mean Serum Uric acid levels Between female vegetarians and Non vegetarians (* $p < 0.05$) Fig-2

Mean Serum uric acid levels in Males in Study group I was 4.7 ± 0.91 . Mean Serum Uric acid levels in males in study group II was 6.1 ± 1.0 . The Mean value in Non vegetarians is more , and is highly statistically significant . ($p < 0.01$) (Table-3)

Parameter	Study Group I N=25 (Males)	Study Group II N=25 (Males)	t value	P value
Serum Uric Acid (mg/dl)	5.27 ± 0.79	5.87 ± 0.45	-2.71	0.009**

Table-3 Comparison of Mean Serum Uric acid levels Between Male vegetarians and Non vegetarians (** $p < 0.01$) Fig-2

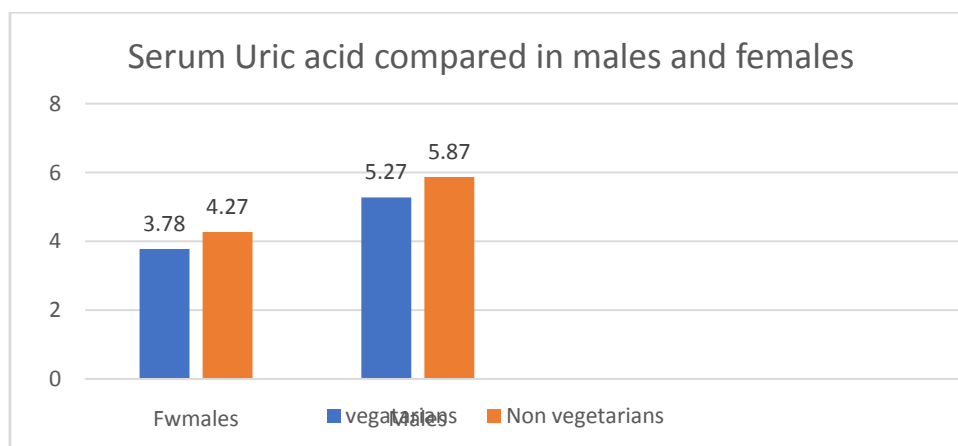


Fig-2. Comparison of Mean Serum Uric acid levels Between Male and Female vegetarians and Non vegetarians

IV. Discussion

Our results showed higher Serum Uric acid levels in Non vegetarians. The purine content of Meat explains the higher levels in Non vegetarians which is in accordance with the previous studies.^{11,12,13} Few studies concluded same levels of Serum Uric acid in both vegetarians and Non vegetarians.¹⁴

In our study the vegetarian group persons were consuming high purine plant based food atleast 3 times in a week. In spite of that low Mean Serum levels of Uric acid are observed. Possibly purines of vegetable origin have different effect on Serum Uric acid levels when compared to Purines of animal origin because of different bioavailability of purine sources.¹⁵

Comparison between serum Uric acid levels in female vegetarians and Non vegetarians showed slightly higher levels among Nonvegetarians. This can be explained by the lower quantity of food consumed by females.

V. Conclusion

Serum Uric acid levels are more in Nonvegetarians than in Vegetarians which is statistically significant. This shows dietary modifications can regulate Serum uric acid levels preventing the development of Gouty Arthritis and other Metabolic Disorders.

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