

CORRELATION BETWEEN HIGH LEVEL OF URIC ACID AND HYPERTENSION

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By

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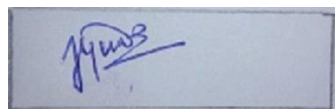
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DECLARATION BY THE SCHOLAR

I hereby declare that the work reported in the B.TECH thesis entitled “**Correlation between uric acid and hypertension**” submitted at **Jaypee University of Information and technology, Wagnaghat, India**, is an authentic record of work done by me (Ayushi Khimta-161837) for the final year (July-2019 to May -2020) carried out under the supervision of Dr. Gopal Singh Bisht (Associate Professor) Department of Biotechnology and Bioinformatics. I have not submitted this work elsewhere for any other degree or diploma.



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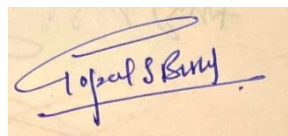
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Date: 1 JUNE 2020

SUPERVISOR'S CERTIFICATE

This is to certify that work reported in the B.tech thesis entitles “**Correlation between uric acid and hypertension** “ submitted by Ayushi Khimta (161837) at **Jaypee University of Information and Technology, Wagnaghat, India** is a bonafide record of her work carried out under my supervision. This work has not been submitted elsewhere for any other degree or diploma.

A handwritten signature in blue ink on a light-colored background. The signature reads "Gopal S Bisht" with a stylized flourish above the name.

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I also owe an appreciation for the contribution of my parents, who helped me in filling up survey forms by their colleagues.

I bow my head before my parents and the Almighty God whose blessing and support gave me the strength to make this successful venture. I dedicate my work to them.

Ayushi Khimta(161837)

Abstract

In this report, there are brief reviews of hyperuricemia research models and research gaps which require to be filled by further studies. It is a well accepted hypotheses that hyperuricemia (high level of uric acid) is associated with various vascular, renal and cardiovascular diseases. Because of these associations it is estimated that there might be a correlation between high level of uric acid and high blood pressure. This project had objectives of conducting surveys' by filling form (which is included in this report) and analyzing the information in Shimla through which this correlation could be understood. This report also tries to highlight some of the medicinal plants used for the treatment of Gout (which is a condition caused by high level of uric acid in the body) and Hypertension.

CHAPTER-1

INTRODUCTION

Uric acid is the end product of the purine metabolism, due to the increased production and decreased excretion via kidney there is an increase in uric acid levels, this condition is then defined as hyperuricemia. Hyperuricemia results in a condition called gout.

Factors responsible for high levels of uric acid (HYPERURICEMIA):

A person is likely to develop hyperuricemia if he/she has high level of uric acid in the body. Following are some factors responsible for increased uric acid level in the body:

DIET: Consuming a diet rich in fructose, meat, sea food may increase the level of uric acid. Alcohol consumption is also not good for hyperuricemia.

OBESITY: Being overweight leads to high food intake, this may further lead to a slow process of absorption of uric acid in kidney also body might face a difficult time in eliminating uric acid hence results increase in accumulation of urate crystals.

MEDICATIONS: Consuming medication especially for hypertension and low dose aspirin may also increase uric acid levels. Also the medication given to people who have undergone organ transplant.

Hypertension on the other hand is another term of high blood pressure. This condition may lead to chronic health complications that position a person for high risk of heart diseases, stroke etc. blood pressure is the force that is created by the flow of blood flowing against the walls of the blood vessels.

This pressure directly depends upon the resistance caused by the blood vessels. Almost half of the population in India is have high blood pressure, but are unaware about it. The first line of treatment for high blood pressure is adjustments in the living standards.

It is advisable for people to perform any form of physical activity for at least 150 minutes (moderate intensity) and 75 minutes (high intensity) in week, depending on age, gender and various other factors. On an average people should workout for at least 5 minutes a day.

Causes of hypertension: The precise causes of hypertension are yet not marked specific. It is a result of various factors such as:

- Unstable volume of blood plasma
- Use of medication, for the regulation of blood plasma and pressure levels.
- Lifestyle factors, such as stress or no physical activity.

The secondary hypertension has more specific causes and may result in other health problems. One of the cause for high blood pressure id the Chronic Kidney Disease, in which the kidney losses its function of filtration of fluids (this is the basis of hypotheses reasoned of the correlation of hypertension and hyperuricemia which is discussed further in detail). Other condition includes diabetes, Cancer of an adrenal gland, over expression of thyroid gland, obesity, irregular sleeping patterns.

There are a number of factors which may increase the risk of hypertension such as Age, Alcohol and tobacco use, gender, Present health conditions of a person, high salt or high fat diet, lower potassium intake, high stress levels, persistence of high blood pressure in family. Hypertension is often labeled as silent killer because its symptoms are not highly noticeable.

Long term persistence of hypertension can result in the thickening of blood vessels which further results in the development of narrow path for the blood to flow through. This condition directly puts all the pressure on heart, as it has to pump the blood harder for circulation this may result in heart attack, heart failure, stroke, amputation. High blood pressure is defined as: SBP \geq 140 mmHg, DBP \geq 90 mmHg.

Hypertension and Hyperuricemia correlation hypotheses:

Animal studies indicate that early in the disease, the extra uric acid activates the renin-angiotensin system of the body, shrinking key blood vessels and causing high blood pressure. Eventually however, these small vessels in the kidney are permanently affected, making the blood pressure sensitive to salt or sodium. However it is also stated that not alone uric acid but also the byproducts coming out of uric acid may directly or indirectly affects the blood pressure of a person [37].

CHAPTER-2

REVIEW OF LITERATURE

In India the study has been conducted in U.P., Gujarat stating a possibility of positive correlation between uric acid and blood pressure [1]. The objective of this study was to investigate the relationship between uric acid levels and blood pressure in the patients attending hospitals in central Gujarat. This was a cross sectional study that was conducted for a period on a year among the indoor and outdoor patients populations' in tertiary care hospitals. The numbers of hypertensive patients included were 100. The exclusion criterion for the study was patients with secondary cause of hypertension, renal dysfunction, acute illness, pregnancy, medication likely to influence the serum uric acid levels. A detailed history of smoking and alcohol consumption was also taken under consideration; detailed clinical examination was also done. Hypertensive patient were defined as Systolic blood pressure ≥ 140 and Diastolic blood pressure ≥ 90 or patients who were already on medication for anti hypertension. Biochemical markers were measured in fasting state. Hyperuricemia was defined as SUA ≥ 6 mg/dl. The data was analyzed using Med Calc software. Total number of subjects was 200 and out of 100 hypertensive subjects, 56% were females and 44% were males. The mean Uric acid level in the group of hypertensive subjects was 6.1 as compared to non hypertensive subjects which was 4.5 (approximate values). It was precisely noted that there was no increase levels of uric acid in non hypertensive group, hence there was an association found with elevated uric acid levels and hypertension. The limitations to this study were acknowledged as limited sample size, subjects with high BMI were not excluded, there was one time determination of uric acid levels, there can also be a misclassification that is causes by variation in the level of uric acid by repeated monitoring.

Serum Uric and Hypertension complications (Kanpur) concluded that having high serum uric acid levels were at high risk of developing complications like hypertensive retinopathy [2]. There are two studies conducted in Himachal Pradesh. There are studies conducted in Tanda, Kangra which stated that hyperuricemia is more prominent in males [3]. This study considered various mechanisms responsible for the association between hypertension and hyperuricemia which includes activation of rennin-angiotensin system which is induced by uric acid and increase in insulin resistance which causes decrease in excretions of uric acid. Thus study was an observational, control study which was conducted in the department of Medicine. The subjects included 50 newly hypertension diagnosed patients and 50 controls who were non hypertensive. The exclusion criteria was the patients with secondary hypertension, diabetes, gout, heart diseases, alcohol abusers, CKD, acute illness, steroidal medication, or any medication likely to fluctuate the uric acid levels and pregnant women. The age and gender of the controls and the under study were calculated properly before using the statistical analysis software. The normal SUA was considered 6.8mg/dl which was measured by uricase method, blood glucose was calculated in the fasting state and all the biochemical tests were done. As a result of this study it was concluded that the prevalence of hyperuricemia was significantly among the subjects with hypertension than in controls who were non hypertensive. It was also concluded by the study that hyperuricemia was significantly higher in males than in females ($p < 0.05$).

There was also a study conducted in IGMC Shimla which concluded that hyperuricemia is associated with an increase risk for incidental hypertension [4]. The objective of this study was to assess the prevalence of hyperuricemia among patients, who were recently diagnosed with hypertension. Hyperuricemia was defined as SUA > 6.8 mg/dl. The number of hypertension patients, is estimated to be 213million by 20255. The time period of the study was one year in the outdoor deriving.

The age group was decided to be 20 years and above. The exclusion criteria was patients with secondary hypertension, obesity, acute illness, pregnancy, steroid medication, or other medications that would affect the serum uric acid levels or plasma uric acid levels, fluctuation in glucose level, renal dysfunction and patients unwilling to take part in the study. Biochemical investigations were done in fasting state. The Student's t-test was used to compare the mean of the variables. Prevalence of Metabolic Syndrome was 68.6% in males and 86.3% in females. The mean of uric acid levels in patients with metabolic syndrome was 5.2, and patients without metabolic syndrome was 4.2 (approx. values). The limitation to this research was the time span of the project.

There is another study conducted which focuses on the serum levels of uric acid and blood pressure tracking in the childhood which concludes that children with higher serum uric acid levels were at higher risk of developing high rates of blood pressure and other metabolic syndromes if not taken care properly[6]. This study included 499 subjects and had two follow up examinations. The checkups were conducted at 3, 5 and 7 years of age, the duration of these checkups was 9 years from November 2005 to July 2014. Height without shoes and weight with light weight clothing was done and blood pressure was taken just after 5 minutes of comfortable sitting. To conclude the factors responsible for high blood pressure at the age of 3 included the history of hypertension in the family, low body weight at the time of birth, duration of breastfeeding and also sodium intake. After applying various tests the results showed that SUA levels in early childhood did influence the blood pressure levels on the adult life. There is a clinical study that says prevalence of hyperuricemia and hypertensions higher in case of men than in women [7]. This study was performed in China. Total number of subjects was 78596(47781 males and 30815 females). The subjects went through medical examination from 2011 till 2015.

BMI was calculated; weight was taken in light clothing and in kilograms, high was calculated without shoes. Blood pressure was calculated after 5 minutes of resting state, the value of blood pressure was taken 3 times and the mean value was considered for the analysis. The analysis of the data computed was done separately for men and women with same variables. The end results were compared and presence of hypertension came out to be higher in males than in females (30.04% and 20.22% respectively). The common age group according to this study was 20 to 70 years and the observable value of high blood pressure was considerably increasing with an increasing age both in men and women. Through this study it is also concluded that men who had the condition of hypertension were also at a risk of developing hyperuricemia, and no such correlation was found in the female subjects. The research gap in this study was that there are still no strong evidence that can be held accountable for the correlation between hypertension and hyperuricemia and hence further biological studies should take place for the same. There has been a study which aims at determining correlation between blood pressure and uric acid in different age groups have affected the groups [8]. The limitations to this study was that there was no control on the variables which might fluctuate the uric acid levels is a person such as taking medication or other drugs, being overweight and renal dysfunction. Total number of subjects included was 91,882, all of them underwent clinical examination the duration was 5 years. Subjects who were taking medication for hypertension were excluded. After exclusion a total of 45,098 subjects underwent the analysis. The age groups has 3 divisions those were <40, between 40 and 59 the final age group was ≥ 60 . The analysis was age specific and also gender specific. The diagnostic of hypertension was done for SBP/DBP at 140mmHg/90mmHg (and higher values than this, weight, height and BMI were all measured). Student's t-test was conducted, and the correlation was analyzed using Pearson coefficient.

It was concluded that blood pressure was higher in the age group of subject less than or equal to 60 years of age and the prevalence of high uric acid levels were higher in the age group of more than 40 years. In this study also men showed a higher risk of developing hyperuricemia due to hypertension as hypertension was observed to be more in men when compared to women. There was a study solely dedicated to women, in this study there was discussion of uric acid values in hypertensive women (postmenopausal)[9].

This study had 100 subjects those were healthy postmenopausal women, the medical history of every individual was taken and all the biochemical tests were performed. The age group of women taken into consideration was 45 to 66 years. The serum uric acid was calculated in laboratory as there were blood samples taken; duration of the study was 3 years. The results of the study suggested that there is a risk of development of high levels of uric acid due to the carotid intima-media thickness in postmenopausal women who were diagnosed with hypertension. The limitations of this study includes inability to monitor the diet (except of alcohol intake) also the intake of contraceptives was not taken into account and the reproductive health was not reported.

There was a study which focused on developing countries for the prevalence of hyperuricemia and its relation to cardiovascular diseases [35]. Those countries were chosen which had high level of blood pressure on an average. Total subjects included were 1011. Data was analyzed based on various regression models. This study took place in islands of Africa. This study showed that this prevalence was more in developing countries because of considerable levels of alcoholism uses of various therapies for hypertension which causes wide fluctuation in the levels of uric acid in a person's body. This study also concluded that the rate of hyperuricemia may grow worldwide because of the changes in life style and obesity (more importantly in developing countries).

Another study focused on the accumulation of the species of oxygen as a result of increase in uric acid production [38], this is one of the mechanisms which is under study and does not have enough evidence to be authenticated. The reason for this hypothesis is not well established because it is supposed that this accumulation has no direct association with blood pressure. The sample size take was 2555. The analysis were carried out by using various regression models and the conclusion was made by taking uric acid from the urinary excretion of one day and the blood pressure was measured by taking into account the pulse pressure of the same day and the mean was calculated of the arterial pressure also of the same day. The result of this study showed that high level of uric acid in the urinary secretions may be associated with higher blood pressure measured by the arterial pressure in one day.

REVIEW OF MEDICINAL PLANTS

Gout is said to occur as a result of accumulation of urate crystals within joints which causes inflammation and pain. High level of uric acid in blood is said to be the root cause of gout as excess urate crystals are formed. Production of uric acid happens when our body breaks down purines. Purines are found naturally in the body and also in certain foods like meat, seafood beer etc. In a normal body cycle, uric acid is absorbed in our body and left over is generally secreted out of the body with urine through filtration, this entire process takes place in the kidney. But sometimes our body is not able to absorb uric acid properly or our body might produce uric acid in excess(due to our dietary habits most importantly). This leads to the accumulation of sharp crystal like structure known as urate crystals.

MEDICINAL PLANTS USED FOR THE TRATMENT OF GOUT:

1. ANDROGRAPHIS PANICULATA: As an estimate about half of the population in developing countries and the developed countries either directly or indirectly depend in plants as first line of defense. In unani medicine and also in ayurveda medicine, Andrograohis Paniculata is a medicinal plant which has one of the highest usage rates [16]. In India this plant is found in various places, one of them is Rewa, which is a district quarter of Madhya Pradesh in the centre of India, the local doctor holds the knowledge of the plant this plant grows in the natural surrounding vegetation and has no side effects after use [17]. The level of blood glucose can be lowered by stimulation of insulin sensitivity and inhibition of the activity of α glycosidase and α amylase. The carbohydrates are digested and absorbed by these enzymes leading to an increase in the blood glucose level [18]. The expression of Hyperinsulinemia and elevated blood sugar level happens at the time of insulin resistance and this is associated with abnormalities in metabolic hormones, such as dyslipidemia, irregular secretion of ovarian testosterone, abnormal uric metabolism and increased inflammatory markers [19]. So anti- hyperglycemic effects of this plant are shown by; 1. Inhibition of α glycosidase and α amylase causes lowering of blood glucose level [20]. 2. Sensitivity for insulin is increased which stimulates glucose uptake and peripheral tissues causes oxidation [21]. 3. The free radicals which result in plasma membrane integrity are scavenged upon which are responsible for uptake of glucose from blood [22].

2. ASTERACANTHA LONGIFOLIA: Hypreruricemia is said to be an important indicator for the prevalence of gout in a person [23]. If we talk about premenopausal women, it is evident that they have less chances of having gout as urate clearance is managed by estrogen hormones [24]. The use of plants for the production of drugs rather than synthetic drugs is increasing in every part of the world [25].

India, Burma, Malaysia, Srilanka and Nepal are prime locations where this plant is distributed [26]. This plant can be used for anti-inflammatory effects [27]. The extracts of the leaves i.e. petroleum ether and chloroform are shown to increase the erythrocyte count and hemoglobin count and the leukocyte count (Pawae et al., 2006a;2006b)

3. *CELASTRUS PANICULATUS*: Various parts of this plant are used for various activities. Healing property is seen in the leaves [28]. Its seeds are said to have hypolipidemic property [29]. The writhing test is a pain model (visceral) widely used test; this test is acetic acid-induced. This test has been used worldwide to find upcoming agents which possess peripheral antinociceptive activity [30]. The administration of acetic acid within the peritoneal cavity leads to elevated secretion of products like eicosanoids, in addition to this it is also held responsible for release of certain inflammatory mediators [31]. These mediators are the ones which are responsible for the sensation of pain as they excite the primary afferent nociceptors and after excitation these enter in CNS. The seeds of this plant have an alcohol extract which produces antinociceptive effect, this effect can be linked to its effect against the pain [31]. However there is a need of further studies regarding the bioactivity of this plant.

4. *BARLERIA PRIONITIS*: There are 300 species of this genus which are known for their medicinal use since ancient times [32]. This plant is also found in India, it is said that the paste of entire plant is applied on the swelled joints externally [33]. Ethyl acetate that is present in the fraction of leaf had shown that there was significant reduction in the swelling of the joints [34]. The study was conducted on rat models.

MEDICINAL PLANTS/ HERBS USED FOR THE TREATMENT OF HYPERTENSION:

1. **ALLIUM SATIVUM:** Common name for ALLIUM SATIVUM is Garlic. Garlic is traditionally used in cooking but its juices can also be used in controlling the elevated levels of SBP. A meta-analysis performed showed that garlic was effective only on those subjects who had high valued of SBP, on the other hand garlic showed no traceable effect on the subjects who had hypertension but their SBP levels were not elevated [39]. Free oxygen radicals are constantly being produced in our bodies. Some of these are consumed by antioxidants to perform normal metabolic functions and some hinder, these leftovers creates problem in the human body. Garlic has shown that it acts as an antioxidant and fetches thee free oxygen radicals present inside the body and hence prevents any metabolic damage and can be helpful in reducing the levels of high blood pressure [40].

2. **MUSANGA CECROPIODES:** This plant is used in various regions of Africa. Primarily found in rainforest, its ant diarrheal property found in the ethanol extract from the bark is used in treating various metabolic abnormalities and regulation of blood flow [41].

3. **PUERARIA LOBATA:** A study conducted on hypertensive dogs, showed that the ethanol extract from the root of this plant, resulted in a decrease in the level of blood pressure [42].when the extract was administered (intravenously) in clinical trails at the dose range 100 to 200mg, the patients showed a noticeable decrease in the level of high blood pressure[43].

4. **ZINGIBER OFFICINAL:** Commonly known as Ginger is known for its effect on the level of hypertension, basically it decreases the level of blood pressure by blocking the calcium channels that are voltage dependent[44]. Although the mechanism of action is known the number of human trials are very less, and the result of these were also inconclusive because of low dose of administration [45].

CHAPTER-3

CONCLUSION:

We must pay attention on our health by getting regular checkups done, one thing lacking in all 87 subjects was that no one got their biochemical tests done, even after the diagnosis of hypertension or elevated level of uric acid also, after through reading of papers, articles, reviews and reports related to correlation between uric acid and blood pressure it is evident that Hypreruricemia is increasing in a considerable rates in the developing countries and already prevails in the developed countries, It has become a globally common condition[10]. Furthermore, it is also reflected through the studies that the prevalence of hypertension is relatively elevated in males and the presence of hypertension was also found to be high in males (references made earlier), additional studies must take place which might be reasonable for this difference in males and females, the studies should focus on sex hormones which can then explain different mechanisms occurring in different sex [11]. There are about 1 billion who have the condition of hypertension worldwide [12]. We must consider the fact the there might not be enough evidences to show the correlation between uric acid and blood pressure, but these are related in some or the other way, this correlation between uric acid and blood pressure was first notes in 1870's by Frederick Mohammed [13]. It is also evident that prevalence of Hypreruricemia was seen in the patients who had hypertension, type 2diabetes mellitus and the patients who had both the conditions [14]. Cross-sectional studies have also suggested that some patients had high level of uric acid especially those with untreated hypertension [15]. The fields which requires a search is finding some common factors between hypertension and hyperuricemia which can be taken into account for mild or major organ damage.

Many researchers have claimed that prevalence of hypertension and hyperuricemia is more in developing countries; further research should take place to consider this claim. Glucose intolerance is highly associated with change in uric acid, which is why the project had included diabetes separately. It is observed that insulin however decreases the ability of body to clear out uric acid which results in the elevated levels of serum uric acid levels[36]. The studies conducted in children also suggest that if there is an onset of any kind of uric acid abnormality, in future the child might have the problem of blood pressure with various other cardiovascular diseases. After going through literature, a project was designed which was survey based. A form was prepared which was to be filled by subjects, having some basis tick marking columns for information such as level of uric acid blood pressure etc.

CHAPTER-4

PROJECT WORK

OBJECTIVE: The objective of this project was to determine the relationship between uric acid and high level of blood pressure.

MATERIAL: The required material for the project was a survey form.

The survey form initially requires basic information like age, gender, eating habits (vegetarian/ non-vegetarian). For level of uric acid, the columns had- first year of diagnoses, triggering edibles/beverages, whether the person is on medication or not. Then for high blood pressure the columns says- first year of diagnoses, base line value of blood pressure and value of blood pressure after taking medication. The next column reads for the Biochemical tests including Vitamin D3, triglyceride and HDL/LDL. There was also an additional question, if the person has diabetes or not. It is known that high levels of Uric acid interferes with various other mechanisms of body, hence adding diabetes was an add on in the form. The last column was related to the life style of a person and included exercise, caffeine intake (coffee/tea), smoking and alcoholism.

METHOD: The survey form was filled by individuals anonymously. For the sake of authenticity the individuals had to sign the forms with the date.

Survey Form

Please fill in correct information as this survey is a part of project, which is aimed for determining the correlation between Hyperuricemia and Hypertension. Your identity remains confidential yet form needs to be signed by you along with date for the sake of authenticity.

Age		
Gender	Male-	Female-
Dietary habits	Veg-	Non-Veg-

1.High level of Uric Acid

Yes / No

Time Period of Prevalence	
Triggering agents	
Medication	

2.High Blood Pressure

Yes / No

Time Period of Prevalence	
Base line value of BP	
BP with medication	

3. Diabetes

Yes/ No

	Rarely	Occasionally	Regularly
Exercise			
Caffine intake(coffee/tea)			
Smoking			
Alcohol intake			

Thank you for filling the form.

Signature:

Date:

The total numbers of forms filled were 87. For analysis, the age groups were divided in 4 groups that were, subjects above 20 years, 30 years, 40 years and 50 years. The gender difference was also taken into consideration. The data was divided as shown in the table below:

AGE	MALE	FEMALE	TOTAL
Above 20	7	9	16
Above 30	11	7	18
Above 40	16	11	27
Above 50	17	9	26

RESULT:

No subject had diabetes; the results mentioned for specific age groups are based on average observation. The age group of 20 years and above had neither hypertension not elevated level of uric acid. Caffeine intake of this age group was regular and the exercises were also regular, with no smoking and no alcoholism.

In the subjects above the age of 30, no females had elevated uric acid or blood pressure. Out of 11 males, 3 had reported hypertension. These subjects had both vegetarian as well as non-vegetarian diet, with regular exercise, no smoking and were occasional drinkers.

In the subjects above the age of 40, no females had elevated uric acid or blood pressure. Out of 16 males, 7 had reported hypertension. The subjects had both vegetarian and non-vegetarian diet, with regular exercise and were occasional drinkers.

Out of these 7 subjects, 2 were regular smokers and were taking medication for hypertension. Also in 11 males 1 subject had elevated level of uric acid but did not have hypertension. This subject was a non-smoker, occasional drinker and did regular exercises. In the subjects above the age of 50, out of 17 males, 13 had reported hypertension. Out of these 13, 8 were on medication for hypertension that were non-smokers, did not consume alcohol and did occasional exercises; the diet was both vegetarian and non-vegetarian. Remaining 5 out of 13, did not take medication 1 was vegetarian, 4 were non-vegetarian. All of them were non- smokers, did regular exercise and were occasional drinkers. In this age group **2 subjects reported hyperuricemia who also had hypertension.** These were out of the 5 subjects who did not take medication. There were 6 females who had hypertension. Out of 6 female subjects, 2 took medication, did occasional exercise and had vegetarian as well as non-vegetarian diet. Remaining 4 subjects were vegetarians and took no medication and were regular with exercises. No female subjects had elevated levels of uric acid.

DISCUSSION:

Through this study, the minor conclusion that can be drawn is that the chances of prevalence of hypertension and uric acid are more in males than in females. Also the age group which is more prone to this condition is above 50 years. Smoking and intake of alcohol (regular or occasional) was seen in the subjects who had hypertension and elevated level of uric acid. Most of the subjects followed both vegetarian and non-vegetarian diet, so according to this study, no influential conclusions can be drawn from this factor. It was observed that subjects, who did not take regular medication, did regular exercise and therefore had had controlled the level of uric acid and blood pressure. The sample size was not enough, because of the outbreak of COVID19 and declaration of national lockdown the project could not be continued. The subjects did not get regular Biochemical tests, other factors such as family history, sodium intake etc were not monitored. Some subjects did not specify the value of blood pressure after medication and subjects did not mention the triggering edibles/beverages for uric acid. No specific observations could be made based on the eating habits (vegetarian/non-vegetarian), because most of the subjects had both diets

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