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Biochemistry

A STUDY OF SERUM URIC ACID IN INDIAN SMOKERS

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ABSTRACT

Background: Tobacco smoking is one of the most common habit in humans across the world which have many oxidative substances that alteres uric acid which is an important antioxidant in our body.

Aims and objectives: Study to prevent smoking as a habit and its hazards and compare the uric acid levels in smokers and nonsmokers with correlation with severity and duration of smoking.

Material and methods: A cross sectional study was conducted in 50 smokers and 50 nonsmokers' healthy adults aged 18 to 45 years, both sex male or female. Samples were collected for estimation of serum uric acid level using RXL max Siemens fully auto analyzer. Data collected was analyzed using SPSS.

Results: The mean of serum uric acid level stastically significant lower in (3.59±0.88) smokers than (4.93±1.2) nonsmoker's ($P<0.05$) which inversely correlates with Numbers of cigarettes/beedis smoked and duration of smoking.

Conclusion: It was concluded that tobacco smoking lowers the serum uric acid level & significant negative correlation with severity of smoking and duration of smoking leads to compromised antioxidant level and hazards to health.

KEYWORDS :

INTRODUCTION:

Tobacco smoking is common habit in young population all over world. As cigarette smoke contains superoxide and reactive nitrogen species that readily react with various biomolecules [1,2], it has been hypothesized that some of the adverse effects of smoking may result from oxidative damage to endothelial cells, which results in nitric oxide shortage [3,4]. Therefore imbalance between oxidants and antioxidants may play an important role in the susceptible smoker [5] In addition cigarette smokers have increased inflammatory response that further enhance their oxidative stress[6]. in which oxidative substance found in these burned smoked is altered the serum Uric acid level which important aqueous antioxidant, above 50% serum free radical scavenging capacity and is an important intracellular free radical scavenger[7,8], therefore, measurement of its serum level reflects the antioxidant capacity .

Only very few study on the effect of cigarette /beedi smoking on serum Uric acid level in India. As there is wide spread habit of smoking cigarette/beedi among in India as well as population of Udaipur district and surrounding areas, hence it becomes crucial to study the effect of cigarette/beedi smoking on Uric acid, of healthy adults.

AIMS AND OBJECTIVES

Aims of study to spread awareness among smokers, the hazards of smoking and discourage it.

Objectives: to study the effect of smoking on serum Uric acid in Indian healthy adult and compare with nonsmokers. To Study of effect of severity and duration of smoking on serum uric acid level in health adults.

MATERIAL AND METHODS

Study place and Design

This study was conducted in clinical lab in department of Biochemistry Central Laboratory of R.N.T. Medical College and attached Hospital, Udaipur. It is observational cross sectional study, have included 100 subjects. Out of 100 subjects, 50 subjects have been healthy smokers and another 50 healthy non-smokers have been taken from general public, patient's attendants, hospital staffs and Medical College students of RNT Medical College and MB Hospital, Udaipur.

After ethical clearance by ethical committee, obtaining written consent, detailed history was asked and physical examination was done in all subjects.

Inclusion Criteria for smokers and non-smokers:

Subjects have age from 18 to 45 years and both sex (Male and Female).

4. The subjects are taking average Indian diet.

The subjects were divided into 04 groups:

a) Non- smokers: subjects who have never smoked or those who left at least more than 05 years smoking taken as controls.
b) Mild smokers: 01-10 cigarettes /beedis/day for at least 05 years or more.
c) Moderate smokers: 11-20 cigarettes /beedis/day for at least 05 years or more.
d) Heavy smokers: more than 20 cigarettes /beedis / day for at least 05years or more.

Exclusion Criteria for smokers and non-smokers:

Subjects having Age below 18years and above 45 years, medical conditions mentioned below known to influence serum uric acid level were excluded from the study(Gout, Renal disease, Chronic Alcoholism, Thyroid dysfunction), who were on diet restriction , taking Antioxidants and taking drugs which affecting levels of serum uric acid level.

After overnight fasting blood sample were collected under aseptic condition. three mL of venous blood were collected from each participant in plain vial and incubated at room temperature for 30 minutes .the clotted blood sample were centrifuged at 6000 rpm for five minutes .serum uric acid were measured by RXL max seimans fully auto analyzer by modified uricase method .

Data Analysis

The results were analyzed using the statistical package for social science software system (SPSS, version 20). Data were described using the mean and standard deviation for the significant differences between groups. t-test was used to compare the difference serum uric acid parameter between smokers and non-smokers. In addition ANOVA test was performed to find the differences of these parameters among three group of smoking intensity. Furthermore, the chi-square test was used to evaluate the association between variables. All

statistical tests were considered significant in p value of <0.05 with a confidence level of 95%.

OBSERVATION AND RESULTS

In the present study 50 smokers and 50 non-smokers subjects were studied for their uric acid level.

Table 1: Serum Uric Acid In Smoker And Non-smokers

Case type	Non smokers	Smokers	P value
	Mean ±SD	Mean ±SD	
Uric acid	4.93±1.2	3.59±0.88	0.001

Values are mean ±standard deviation in mg/dl, value are derived from analysis of variance (p <0.001; highly significant).

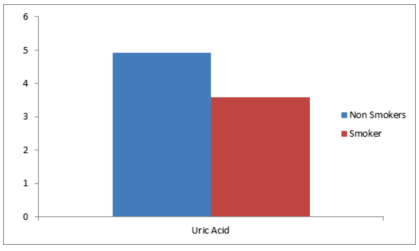


Table 2: Parameters In Relation To Number Of Cigarettes Or Beedis Per Day In Smokers As Compared To Non-smokers

Parameters	Non smokers	Mild 1-10 cigarettes /beedis/day	Moderate 11-20 cigarettes /beedis/day	Heavy >20 cigarettes/ beedis/day	P Value
Uric acid	4.9±1.2	4.07±0.69	3.3±0.93	3.1±0.82	<0.05

Value are mean± standard deviation in mg/dl, p<0.05 are significant.

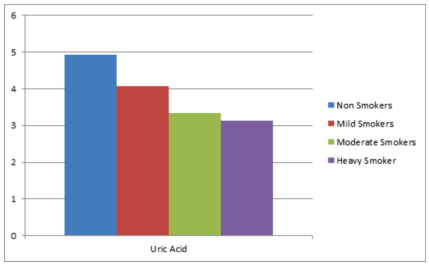
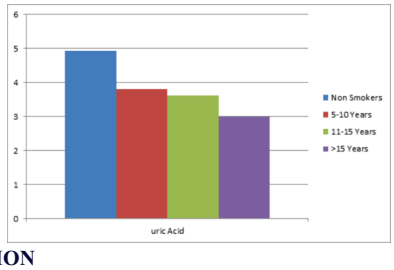


Table 7: Parameters In Relation To Duration Of Smoking In Smokers As Compared To Non-smokers

Type of smokers	Non smokers	Group 1 5-10 years	Group2 11-15 years	Group 3 >15 years	P value
Uric acid	4.9±1.2	3.81±0.79	3.62±0.94	2.9±0.83	<0.05

Graph 20: Serum Uric Acid Level Among Non-smokers And Different Duration Group Of Smokers



DISCUSSION

Present study shows comparison of serum uric acid parameter among smokers and non-smokers. Tobacco smoke contains many toxic compounds and free radicals which can alter body metabolic pathway significantly. Inhalation of such smoke regularly for long time can aggravate the situation and lead to serious health hazards.

Smoking is also independent risk factor and modifiable risk factor for development of pulmonary diseases, cancers, cerebrovascular diseases, peripheral vascular diseases etc. risk of proportional of these complications is directly proportional to amount of smoking[9]. Therefore, smokers should be counselled regarding health hazard to them as well as to people around them who becomes victims due to passive smoking[10]. They should be encouraged to quit smoking and adopt healthy lifestyle to reduce the risk of developing health related problem[11].

In our study we found that serum uric acid level (3.5 mg/dl) was highly significant (P<0.001) when compared to nonsmoker sand these results were in consistent with above studies by **Tahani et al**[12].

CONCLUSION

It may be concluded that, cigarettes/beedis smoking in young adult's lowers serum uric acid which is inversely proportional to number of cigarettes /beedis smoked per day and duration of smoking which directs towards increase hazards of health risk. So it is strongly recommended to avoid smoking for the benefits of overall health.

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