

**EFFECT OF ALCOHOL ON URIC ACID LEVELS AMONG SUDANESE PEOPLE**

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ABSTRACT

Background: Several metabolic changes occurs in human's body due to alcoholic consumption which may lead to changes in biochemical substance such as uric acid. **Objective:** The aim of this study is to evaluate serum uric acid levels among alcoholic consumption and non-alcoholic. **Material and method:** This study included 73 samples, 43 samples of alcoholic and 30 samples of non-alcoholic and they don't have diseases affecting in the level of uric acids. **Result:** The result showed 67% of participant in a daily use of alcohol and 33% use it frequently, Blood sample were collected for uric acid level using enzymatic spectrophotometer method, Uric acid level raises in people who use alcohol daily compared to those who are frequently using, And there is a strong positive relationship between uric acid levels and duration. **Conclusion:** Serum uric acid level affected by alcohol use and increase according to the amount used.

KEYWORD: Serum uric acid.**INTRODUCTION**

Alcohol use is rising rapidly in developing regions and is a major concern among indigenous people around the world, showing a higher prevalence of liver disease. However, levels and patterns of alcohol consumption do not fully explain the cause of alcoholic liver disease mortality. The global burden of disease project estimated alcohol to be responsible for 1.5% of all deaths and 3.5% of those who live life with disability. In the USA, 67.3% of the population over 18 years of age drinks alcohol each year.^[1] Gout is considered a major public health issue because it greatly impacts on quality of life. Serum uric acid (SUA) levels are influenced by both genetic and non-genetic factors, including obesity and the consumption of alcohol.^[2] Alcohol consumption is associated with a number of changes in cell function and the oxidant- antioxidant system, body weight, percent of body fat, body mass index, same hematological parameters are effect.^[3] Chronic alcohol consumption is accompanied by various metabolic abnormalities. Alcohol consumption cause direct damage to the kidneys with lead to elevating blood pressure and inducing electrolyte imbalance. Though one study showed that alcohol consumption was significant associated with lower blood urea nitrogen (BUN) and creatinine. However, in another study alcohol intake had no effect on glomerular filtration rate (GFR) and renal plasma flow. Alcohol induces hyperuricemia by several mechanisms, the diuresis and volume depletion induced by alcohol consumption result in decreased glomerular filtration rate (GFR) and increased tubular reabsorption of uric acid. The lactic acidosis that follows alcohol

ingestion diminished the renal tubular secretion of uric acid by competitive inhibition between lactic acid and uric acid. Recently it has been shown that the production of uric acid for adenine nucleotide is increased when large amount of alcohol are consumed. Several metabolic changes occurs in humans 'body duo to alcoholic consumption which may lead to changes in biochemical substance such as uric acid.^[4]

MATERIAL AND METHODS**Study population**

A total 73 sample were enrolled in this study, 43 were Alcoholic subjects and 30 were healthy individual as control group.

Inclusion criteria

Male should be alcoholic consumption, Age between 25 – 65 years and free from chronic disease e.g.: Diabetes, Hypertension, Liver or renal diseases.

Execution criteria

Female donor people with chronic disease and below age.

Sampling

Sample of 5 ml venous blood were collected from each participant at pliant container then were kept at 4C° and centrifuged at 10000 rpm for 10 mints to obtain serum. Serum uric acid was measured using spectrophotometer.

Statistical Analysis and Result

The mean of age was matched in both group, mean age of case was (43.65±13.09) and control (39.00±12.61) table 1.

The results showed that, 67% was consuming alcohol daily, while 33% consuming alcohol sometimes figure 1.

Independent t-test showed that alcoholic subject had higher levels of the uric acid as compared to non-alcoholic subject p-value 0.008 figure 2.

Uric acid levels were significantly increased among alcoholic daily drinker's subject compared to alcoholic sometimes drinkers subject p-value 0.034 figure 3.

Pearson correlation shows positively relation between uric acid levels and age (R=0.253, P=0.032) figure 4.

Also, positively correlation was observed between uric acid levels and duration of alcoholic drinking (R=0.381, P=0.012) figure 5.

Table 1: General description of study group.

Variables	Case (Mean±SD)	Control (Mean±SD)
Age	43.65±13.09	39.00±12.61
Duration (Years)	12.44±6.36	-
Quantity (ml)	767.44±398.64	-

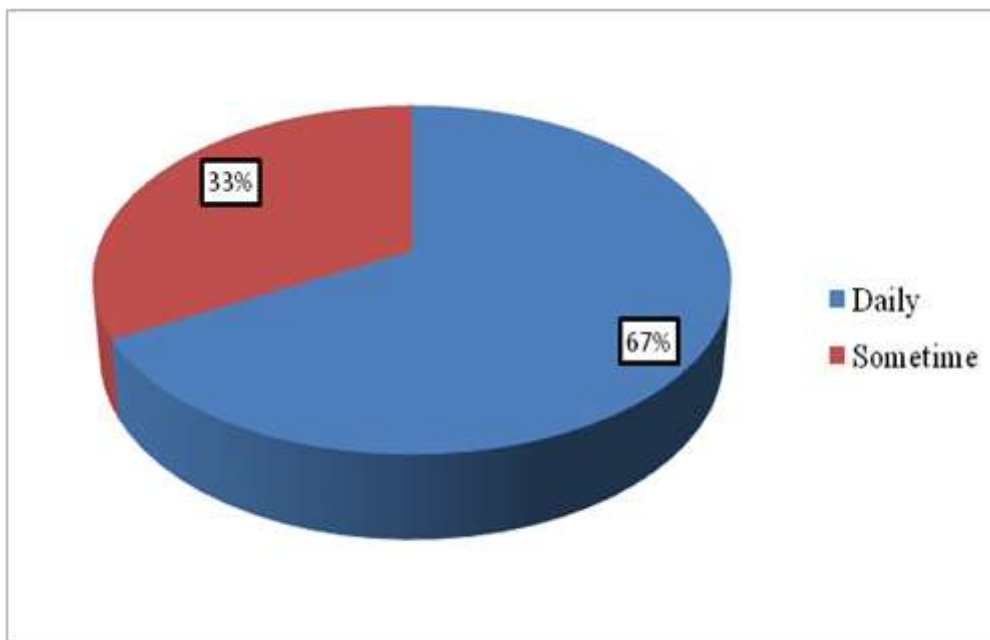


Figure 1: Percentage of alcohol intake among the study group.

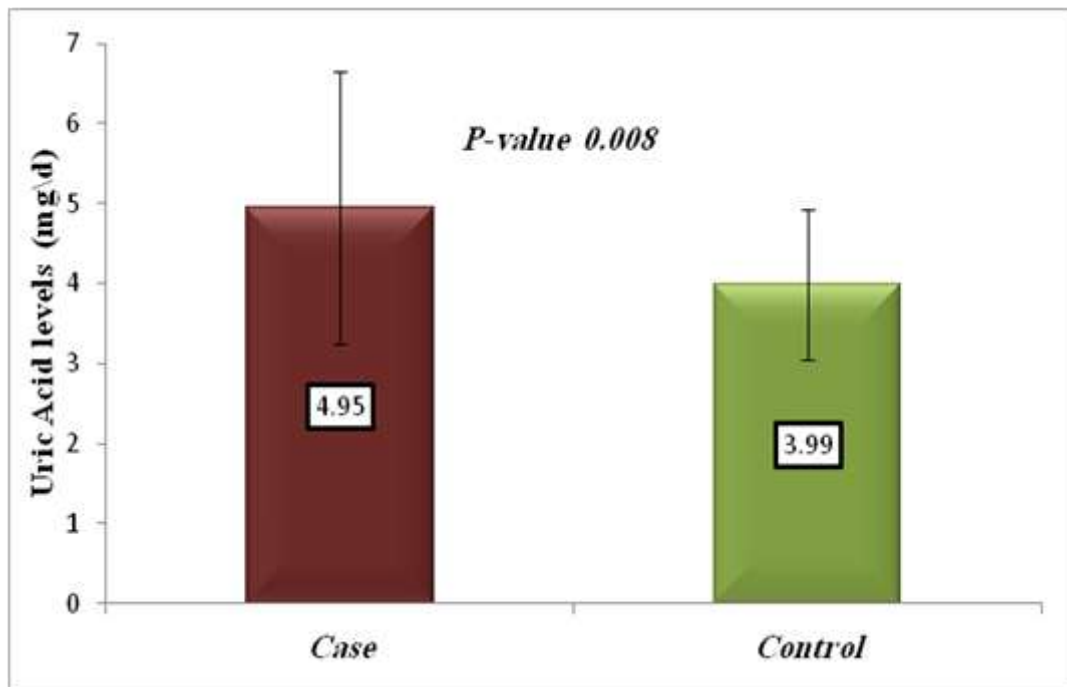


Figure 2: Mean concentration of uric acid among case and control group.

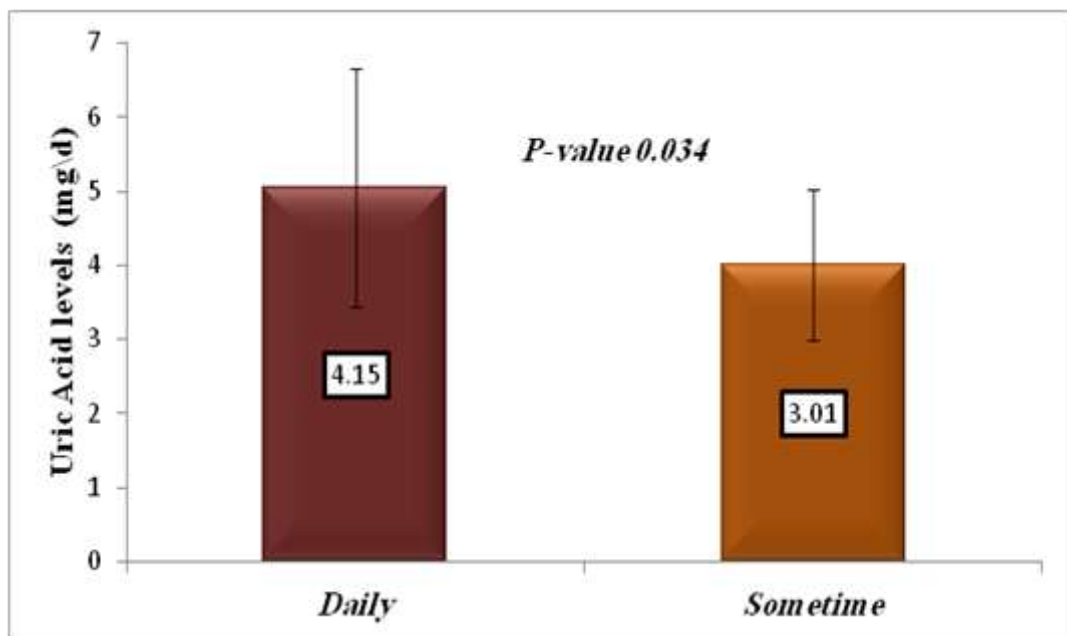


Figure 3: Mean concentration comparison of uric acid.

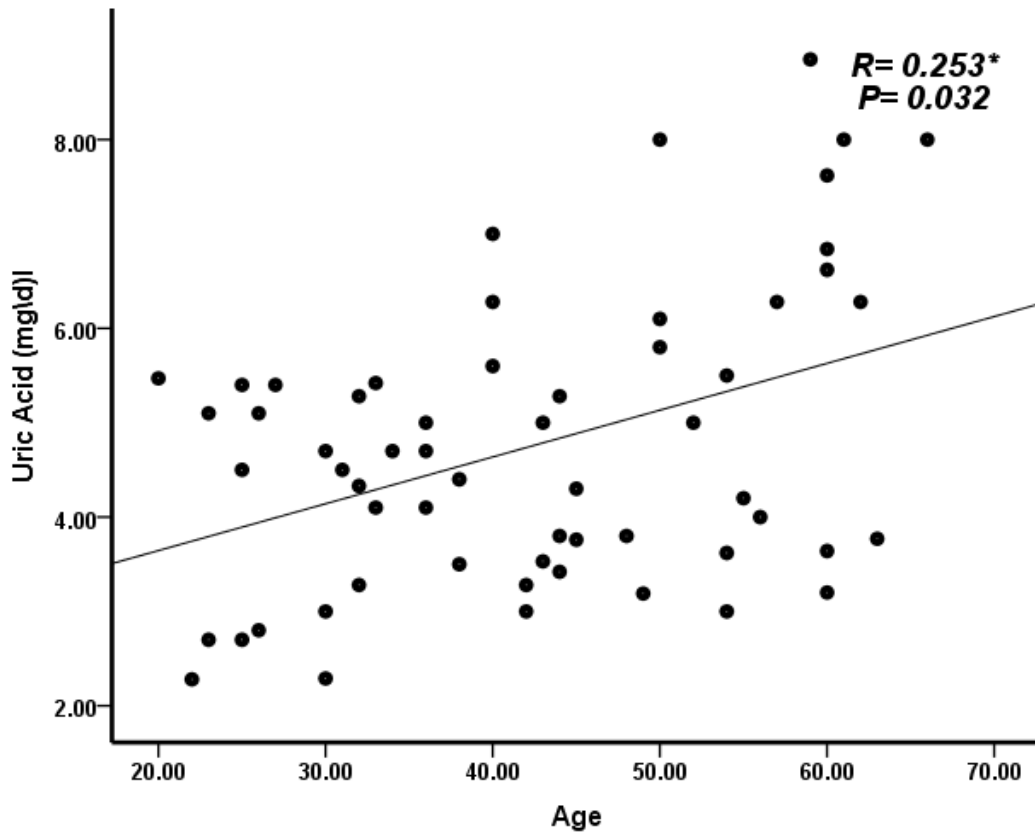


Figure 4: Correlation between uric acid and age.

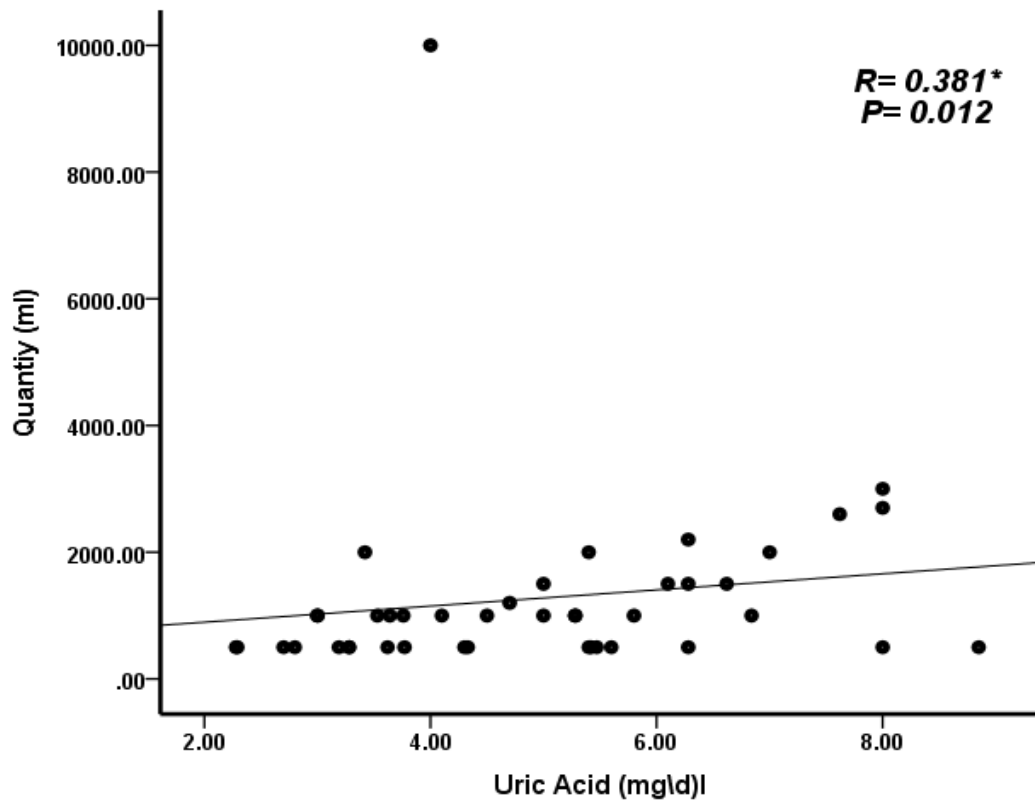


Figure 5: Correlation between uric acid and quantity.

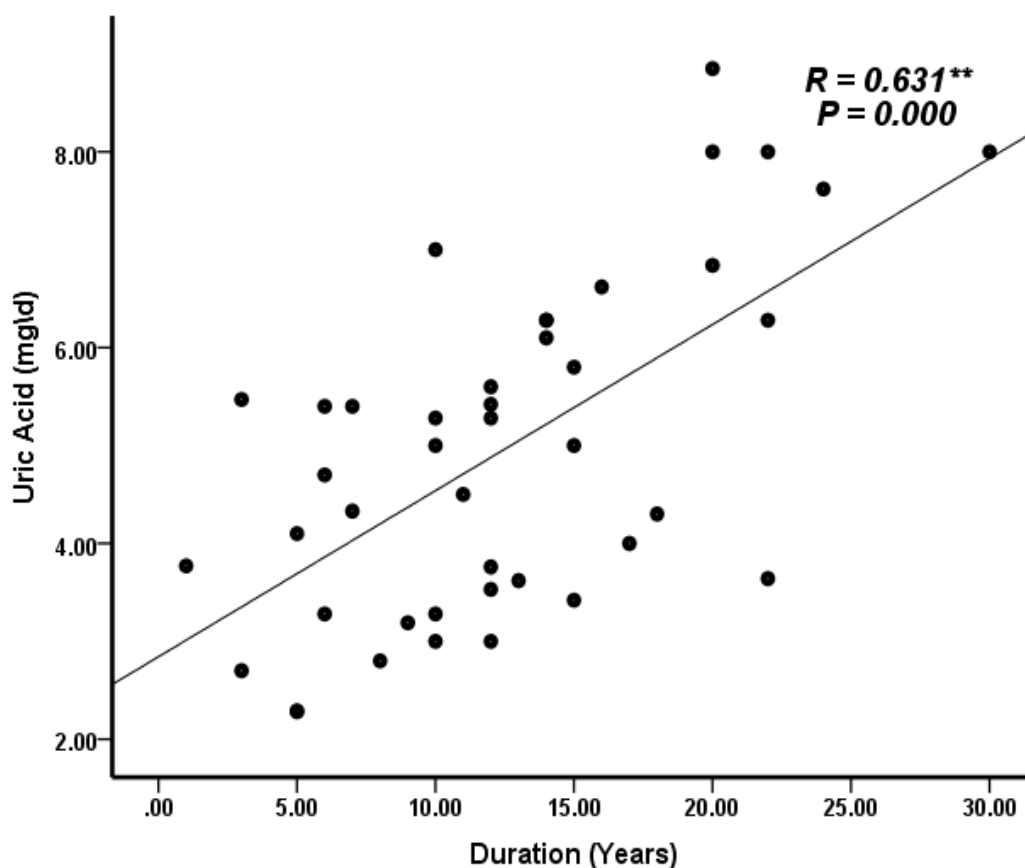


Figure 6: Correlation between uric acid and duration.

DISCUSSION

The duration of alcohol intake ranged between 2 to 25 years it deals with the amount they take about (1000-1500) ml. in our study alcohol has a direct effect in uric acid metabolisms depend on lab results and statistical analysis, There are several changes occurs in biochemical parameter in the body such as uric acid. Being alcohol induced person leads to potentially increased concentration of uric acid and leading to health problem.^[5] The present study revealed that, alcoholic subject had higher levels of the uric acid as compared to non-alcoholic subject (*P-value* 0.008). Similar findings were observed by Mohamed et al (2016) in their study they found that alcohol intake has been showed to increase uric acid production by increasing ATP degradation to AMP uric acid precursor.^[5] Other study done by Puig et al (1984) with similar findings showed that ethanol increases in uric acid production involve acetate conversion to acetyl Co A the metabolism of ethanol.^[6]

Uric acid levels were positively correlated with age, and duration of alcoholic drinking.

Our study also included the effect of the amount of alcohol on uric acid level and compared with previous studies that also show positive correlation with amount of alcohol intake.

A study conducted in Japanese men who worked for a metal products factory in Toyama prefecture, between the ages of 20–54 years, reported that both moderate and heavy alcohol intake increased the risk of incident hyperuricemia.^[7]

Acute alcoholic intoxication may produce transient lactic acidemia and ketosis, leading to inhibition of the renal tubular secretion of urate and to hyperuricacidaemia. 6 Long term oral and short term intravenous administration of alcohol to patients with gout showed that alcohol increases the synthesis of urate by increasing the turnover of adenine nucleotides. 7 Beer drinkers may have to contend with not only the hyperuricacidaemic effects of alcohol but also the high purine content of beer. 8 Taken together these studies suggest that the long term consumption of alcohol increases the synthesis of urate while acute intoxication makes things worse by reducing its excretion.^[8] so, our study agrees with this studies.

CONCLUSION

The result was concluded that alcoholic subject had higher levels of serum uric acid, and uric acid levels was correlated positively with age and duration of alcoholic drinking.

REFERENCES

1. Michael L. Bishop, Edward P. Fody, Larry E. Schoeff, *Clinical chemistry* 7th edition, 2013; 250-251.
2. Adak M, Thakur AN, Adhikari K, Study of Biochemical Markers in Alcoholic Liver Disease: Hospital-Based Case Control Study, *Research Journal of Pharmaceutical, Biological and Chemical Sciences*, 2012; 3(3): 987-995.
3. Shino Suma, Mariko Naito, Rieko Okada, Sayo Kawai, Nobuyuki Hamajima, Associations Between Body Mass Index And Serum Uric Acid Levels In A Japanese Population Were Significantly Modified By Lrp2 Rs2544390, *Nagoya Journal Medicine*, 2014; 76: 333- 339.
4. Subir Kumar Das and Vasudevan D. M. "Biochemical Diagnosis of Alcoholism" *Indian Journal of Clinical Biochemistry*, 2005; 35-42.
5. Shmerling, R.H. Management of gout: A 57-year-old man with a history of podagra, hyperuricemia, and mild renal insufficiency. *JAMA*, 2012; 308: 2133–2141.
6. Puig JG, Fox IH. Ethanol-induced activation of adenine nucleotide turnover. Evidence for role of acetate. *J Clin Ingest*, 1984; 74: 936-41.
7. Nakamura, K.; Sakurai, M.; Miura, K.; Morikawa, Y.; Yoshita, K.; Ishizaki, M.; Nakagawa, H. Alcohol intake and the risk of hyperuricaemia: A 6-year prospective study in Japanese men. *Nutr. Metab. Cardiovasc. Dis.*, 2012; 22: 989–996. [CrossRef] [PubMed]
8. NH and MRC Senior Principal Research Fellow, Cardiovascular Research Laboratory, The Royal Melbourne Hospital, Australia.