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Original Research Article

Effect of tobacco smoking on the enzymatic activity of serum gamma-glutamyltransferase

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ABSTRACT

Background : There have not been many studies evaluating the relationship of Gamma-glutamyltransferase (GGT) levels with former smoking and it is still not clear whether the effect is independent of alcohol drinking. This study was performed to evaluate the association between smoking status and serum GGT concentration.

Methodology : One hundred and twenty participants were incorporated in the research. All the subjects were separated into 2 groups. Group 1 consist of 60 volunteers with habit of smoking. Group 2 consist of 60 volunteers without the habit of smoking. Four to 6 ml venous blood was reserved from all character by disposable syringes. The samples were instantly centrifuged for (10) minutes at 3000 round per minute, and the serum gained was analysed straight.

Results: The findings specified that the smoker group classify as moderate smoker group. The findings acquired specified that the mean serum GGT activity was (23.49 ± 3.39 IU/L), in smokers group. This value was superior significantly to that acquired in non-smokers group (12.92 ± 2.73 IU/L) ($p<0.003$).

Conclusions : Significant augmented action of GGT in smokers appears to sustain the injurious effects of cigarette smoking. Supplementary findings are essential to explain the alliance among dietary and existence factors and serum GGT activity.

1. Introduction

Gamma-glutamyltransferase (GGT) is an enzyme that is establish in numerous organs during the body, with the maximum concentrations establish in the liver. GGT is superior in the blood in majority of the diseases that reasons hurt to the liver or bile ducts. This test calculates the level of GGT in a blood sample. Usually, GGT is there in small levels, although when the liver is indignant the GGT level can increase. GGT is typically the primary liver enzyme to increase in the blood when some of the bile ducts that take bile from the liver to the intestines become stymied. This creates it the mainly sensitive liver enzyme investigation for distinguishing bile duct problems.[1–3]

Clinical studies have revealed that GGT is extremely sensitive in acute and chronic liver disease. Increase in serum GGT activity can forecast morbidity and mortality of liver disease. This aspect may have supplementary responsibility in the aetiology or development of the hepatocellular carcinoma.[2,4]

Basic and clinical research suggests that cigarette smoking affects the liver with numerous toxins in cigarettes altering enzymatic and inflammatory pathways in hepatic physiology. Smoking, has been shown to increase risk of cirrhosis and may adversely affect the progress of chronic liver diseases. In addition, cigarette smoking may aggravate the pathogenic effects of alcohol on the liver.[5] The association between smoking and liver function in the general population is less clear. A few population studies have examined the

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relationship between smoking and enzymes measuring liver function such as gamma-glutamyltransferase (GGT), alanine aminotransferase (ALT), aspartate aminotransferase (AST) and alkaline phosphatase (ALP).[6,7]

GGT has also been introduced as a biomarker for oxidative stress by smoking as well as alcohol consumption. It is an emergent risk marker for a variety of common diseases such as diabetes and cancer, as well as for overall and cause-specific mortality.[8,9] improved considerate of things determining entity GGT levels therefore has turn out to be a pursuit of elevated significance to public health. However, there have not been many studies evaluating the relationship of GGT levels with former smoking and it is still not clear whether the effect is independent of alcohol drinking. This research was executed to assess the alliance amid smoking status and serum GGT concentration.

2. Materials and Methods

The present study was performed in the Department of Tuberculosis and Respiratory Medicine, GMERS Medical College, Dharpur, Patan for the duration of one year. This study was approved by the Human Research Ethics Committee of Hospital. Each participant received written informed consent. All results were anonymous.

One hundred and twenty subjects were incorporated in the study. All the contributors were separated into two groups. Group 1 consist of 60 volunteers who had the habit of smoking. They were taken as study group. Group 2 consist of 60 volunteers who did not have the habit of smoking. They were occupied as control group. In the group 1 there were 54 males and 6 females and in group 2 there were 58 males and 2 females.

Every subjects in the groups (1 and 2), were actually healthy, and informed -consent was obtain orally from all subjects and they were interviewed to acquire their smoking histories, with the quantity of cigarettes smoked/day and the integer of years of smoking. Inclusion criteria were as follows: subjects with age > 18 years containing the history of smoking 10-20 cigarettes /day accounted as moderate smoker. Exclusion criteria were chronic diseases, usual utilize of medicine, utilize of vitamins or previous dietary enhancements and non smokers. The data gathering in this study from female smokers was not simple and not there sufficiently, additional efforts to engage female applicants has unsuccessful, since they are embarrassed of take part in the study, hence the common of members were male smokers.

Four to 6 ml venous blood was reserved from every person utilizing disposable syringes. The samples were instantly centrifuged for (10) minutes at 3000 round per minute, and the serum acquired was analyzed directly. Serum GGT activity was resolute by kits for the 2 groups according to the process which is explained by Szasz, Rosalki and Tarlow process.

2.1. Statistical analysis

The statistical assessment of the outcomes was considered utilizing the SPSS software version 15 for windows. The dissimilar variables were evaluates to each other; and tested with the unpaired student test. Simply $p<0.05$ is observed as significant.

3. Results

The present study was performed to evaluate the association between smoking status and serum GGT concentration. Total of 120 participants were included in the study and were divided in two groups. One was taken as control group and other as study group.

The outcomes acquired designate that the smoker group classified as moderate smoker group. The mean S.GGT activity was 23.49 ± 3.39 IU/L in smokers group. This value was superior significantly to that acquired in non-smokers group (12.92 ± 2.73 IU/L) ($p<0.003$).

Table 1: Serum GammaGlutamyltransferase activity in smoker and non-smoker groups

Groups	No.	Serum Gamma Glutamyltransferase (IU/L)
Group 1	60	23.49 ± 3.39
Group 2	60	12.92 ± 2.73

4. Discussion

Gamma-glutamyltransferase (GGT) has also been introduced as a biomarker for oxidative stress by smoking as well as alcohol consumption. It is an emergent risk marker for a variety of common diseases such as diabetes and cancer, as well as for overall and cause-specific mortality. Improved accepting of factors influential person GGT levels therefore has turn out to be a pursuit of elevated significance to public health. However, there have not been many studies evaluating the relationship of GGT levels with former smoking.[10,11]

Many studies have shown that serum GGT is a biomarker of increased alcohol consumption, however, GGT is known to be affected beside previous condition, such as smoking, obesity, and hepatic steatosis.[12] Data is gathering that higher serum GGT levels may be associated with an increased incidence of cardiovascular events, metabolic syndrome and diabetes; therefore, more attention has been paid recently to this liver enzyme. It is possible that the association between GGT and various disorders observed in previous studies may be mediated, in part, by enhanced insulin resistance in subjects with increased GGT levels.[13]

In the present research, reveals an association of serum GGT to cigarette smoking. Preventative means should be exaggerate on all probable levels to support participants to abstain from this danger, this method dipping the probability

of diverse chronic diseases and transience. The mean action of serum GGT in cigarette smokers was significantly superior to that of non-smoker persons. Our findings are in harmony with those acquired by Gresnner et al., [14]

The increase of serum level of GGT has been accounted to be connected with liver diseases; these designate that liver function enzymes can be utilized as biomarkers for the evaluation of hepato-biliary disease. Mainly, GGT is accounted to have appeared as the clinically helpful diagnostic test. [14] The explanation made from the findings of this current researches a result provide a suggestion that cigarette smoking may be measured to be one of the prejudice existence risk factor for liver disorders.

5. Conclusions

Significant improved action of GGT in smokers appears to sustain the damaging things of cigarette smoking. Additional studies are essential to elucidate the alliance amid dietary and lifestyle factors and serum GGT activity.

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8. Conflict of Interest

The authors declare that they have no conflict of interest.

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