

Assessment of Liver Enzymes (ALT – AST) among Cigarette Male Smokers in River Nile State, Sudan

Mosab Nouraldein Mohammed Hamad* Hisham Abd alhameed Ibn Idris¹, Amna A. Alameen¹, Fatima A. Naser¹, Omnia M. Ahmed¹, Razan S. Abdulla¹, Sara M. Alhaj¹, Tibyan A. Shareef¹, Ghanem Mohammed Mahjaf², Mosab Nouraldein Mohammed Hamad³

¹Department of Histopathology, College of Health Sciences, Elsheikh Abdallah Elbadri University, Sudan.

²Department of Medical Microbiology, Faculty of Medical Laboratory Sciences, Shendi University, Shendi, Sudan.

³Department of Parasitology and Medical Entomology, College of Health Sciences, Elsheikh Abdallah Elbadri University, Sudan

***Corresponding Author:** Mosab Nouraldein Mohammed Hamad, Assistant professor, College of Health Sciences, Elsheikh Abdallah Elbadri University, Sudan

Received Date: February 16 2023; **Accepted Date:** April 10 2023; **Published date:** April 14 2023.

Citation: Mosab Nouraldein Mohammed Hamad, (2023). Assessment of Liver Enzymes (ALT – AST) among Cigarette Male Smokers in River Nile State, Sudan. Journal of Internal Medicine & Health Affairs. 2(1). DOI: 10.58489/2836-2411/019

Copyright: © 2023 Mosab Nouraldein Mohammed Hamad, this is an open-access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Abstract

Smoking use is widely spread throughout the world. The effect of smoking on human health are serious and, in many cases, deadly. This is a cross-sectional study conducted during the period from April 2018 to measure ALT & AST activities between smokers and nonsmokers. Thirty smokers were selected as the test group and thirty nonsmokers as the control group (age was matched (30-65)). Blood specimens were collected from both groups, and serum ALT & AST activities were determined by using an auto-analyzer (Mindary). Insignificant in means of serum AST & ALT activities in smokers when compared to the control group. The results also showed an insignificant correlation between age and serum AST&ALT activity. Statistical analysis also showed an insignificant correlation between the duration of smoking and serum AST&ALT activity. The result also showed an insignificant correlation between the number of cigarettes per day and serum AST & ALT. No correlation between AST & ALT activities with duration of smoking per year, no correlation between AST & ALT activities with age, and no correlation between AST & ALT activities with several cigarettes per day.

Keywords: Liver Enzymes, Cigarette, ALT, AST, Sudan

Introduction

Cigarette smoking is a major cause of preventable morbidity and mortality. Worldwide, more than 3 million people currently die each year from cigarette smoking [1]. The risk of death in smokers is measured by the number of cigarettes smoked daily, the duration of smoking, the degree of inhalation, and the age of initiation [2]. Cigarette smoke contains over 4000 different chemicals, 400 of which are proven to be carcinogenic; it also contains various oxidants such as oxygen free radicals and volatile aldehydes which are probably the major causes of damage to biomolecules [3]. The liver is a vital organ of vertebrates and some other animals. In the human, it is located in the upper right quadrant of the abdomen, below the diaphragm. The liver has a wide range of functions, including detoxification of various metabolites, protein synthesis, and the production of

biochemicals necessary for digestion. The liver is a gland and plays a major role in metabolism with numerous functions in the human body, including regulation of glycogen storage. Markers for hepatocellular necrosis (ALT; most specific for hepatocyte injury, AST; less specific than ALT significant presence in other tissues, LD least specific significant presence in other tissues). A marker that reflects cholestasis (Alkaline phosphatase, Gamma-glutamyl transferase). Tests to assess liver disorders (Total bilirubin, direct bilirubin (conjugated), indirect bilirubin (unconjugated), Albumin, Ammonia, Alph fetoprotein) [4]. Aspartate transaminase Enzyme code (EC2.6.1.1) Aspartate transaminase (AST) or aspartate amino transferase, also known as AspAT/ASAT/AAT or serum glutamic oxaloacetic transaminase (SGOT). Referencerange 5 to 30 U/L

(37C) [5]. Alanine transaminase(EC2.6.1.2), Alanine transaminase (ALT) is a transaminase enzyme. It is also called alanine aminotransferase (ALAT) and was formerly called serum glutamate-pyruvate transaminase (SGPT) or serum glutamic-pyruvic transaminase (SGPT). Reference

range of ALT 6-37 U/L (37C) [5]. The active substance in tobacco, especially cigarettes, is administered by burning the leaves and inhaling the vaporized gas that results. This quickly and effectively delivers substances into the bloodstream by absorption through the alveoli in the lung [6]. Smokers are more likely than non-smokers to develop heart disease, stroke, lung cancer, and cardiovascular disease. Smoking can cause lung disease by damaging airways and the small air sacs (alveoli). Smoking harms nearly every organ of the body and affect a person’s overall health [6].

Materials and methods

Study design

This is a cross-sectional study.

Study area

The study was conducted in River Nile State.

Study population

Thirty smokers were enrolled as the test group and thirtynonsmokers as the control group was enrolled in this study according to inclusion and exclusion criteria.

Inclusion Criteria

Healthy looking cigarettes male Smokers in River Nile State.

Exclusion Criteria

Cigarette male smokers with liver disease, alcohol abuse, bone disease, and cardiac disease were excluded.

Samples

Samples were collected under aseptic conditions and placed in sterile plain containers, and after clotting centrifuged for 3 minutes at 3000 RPM to obtain serum, then serum was kept at -20c till the time of analysis.

Ethical consideration

Smokers who voluntarily accepted to participate in the study were included.

Data Analysis

Data were analyzed by SPSS (Statistical Package for the Social Science).

Results

Table 1: Distribution of study group according to age

Age	Frequency	Percentage (%)
25 – 35 years	7	23.3%
36 – 45 years	9	30.0%
46 – 55 years	8	26.7%
More than 55 years	6	20.0%
Total	30	100%

Table-2: Distribution of study group according to duration of smoking

Duration of smoking	Frequency	Percentage (%)
Less than 10 years	14	46.7%
10 - 20 years	9	30.0%
21 - 30 years	4	13.3%
More than 30 years	3	10.0%
Total	30	100%

Table-3: Distribution of study group according to number of cigarettes smoke per day

Number of cigarette/ days	Frequency	Percentage (%)
Less than 5 cigarettes	1	3.3%
5 - 10 cigarettes	20	66.7%
11 - 15 cigarettes	3	10.0%
16 - 20 cigarettes	6	20.0%
Total	30	100%

Table-4: Distribution of study group according to type of smoking

Type of smoking	Frequency	Percentage (%)
Cigarette	30	100%
Others	0	0%
Total	30	100%

Table-5: Distribution of study group according to other hereditary disease among study group

Other disease	Frequency	Percentage (%)
Yes	0	0%
No	30	100%
Total	30	100%

Table-6: Distribution of study group according to AST

AST	Frequency	Percentage (%)
10 - 20	12	40.0%
21 - 30	14	46.7%
31 -40	4	13.3%
Total	30	100%

Table-7: Distribution of study group according to ALT

ALT	Frequency	Percentage (%)
< 10	10	33.3%
10 - 20	16	53.3%
21 - 30	2	6.7%
31 -40	2	6.7%
Total	30	100%

Discussion

Nicotine is the major component of cigarette smoke plays an important role in the development of many diseases. It causes oxidative damage to the kidney, lungs, liver, and heart. It is a potential oxidant, which is capable of producing free radicals and reactive oxygen species. Nicotine induces free radicals to react with bio membrane causing oxidative destruction of polyunsaturated fatty acid and forming cytotoxic aldehydes by lipid per-oxidation implicated in the pathogenesis of several diseases. This is a cross-sectional study aimed to study the effect of smoking on liver enzyme activities. 60 males (30 smokers and 30 nonsmokers) were enrolled in this study to study the effect of smoking on liver enzymes. After the evaluation of enzymes activities by the auto analyzer, the statistical analysis was done by using the SPSS computer program and the results showed that all liver enzyme levels were insignificantly in the smoker group when compared to the non-smoker group, with no increase in activity of AST & ALT in smokers indicate tissue damage due to loss of

functional integrity of cell membrane. This result disagrees with the results of a study conducted in El-beidia city, Libya done by Alsalhen to show the effect of cigarette smoking on liver function among smokers and non-smokers male, showed that the smokers had significantly higher than the non-smokers in AST, ALT,

Sources of Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Conflict of Interest

The author has declared that no competing interests exist.

References

1. Anna p.ciulla, Donald C.lehman (2002). Success in clinical laboratory science (4th ed.). Edited by Anna P.Ciulla, Donald C.lehman..
2. Armitage, A. K., & Turner, D. M. (1970). Absorption of nicotine in cigarette and cigar smoke through the oral

mucosa. *Nature*, 226(5252), 1231-1232.

3. Leone, A. (2005). Biochemical markers of cardiovascular damage from tobacco smoke. *Current pharmaceutical design*, 11(17), 2199-2208.
4. Zakim, David; Boyer, Thomas D. (2002). *Hepatology: A Textbook of Liver Disease* (4th ed).
5. Bates, C., McNeill, A., Jarvis, M., & Gray, N. (1999). The future of tobacco product regulation and labelling in Europe: implications for the forthcoming European Union directive. *Tobacco control*, 8(2), 225-235.
6. Benowitz, N. L., Hall, S. M., Stewart, S., Wilson, M., Dempsey, D., & Jacob III, P. (2007). Nicotine and carcinogen exposure with smoking of progressively reduced nicotine content cigarette. *Cancer Epidemiology Biomarkers & Prevention*, 16(11), 2479-2485.
7. Osifo J. Ehiozomwanogie, Okuonghae P. Osazee, Ibeh N. Isaiah, R. Omoregie, IdemiliNgozi, Akpata Chichi (2011). Serum Gamma- Glutamyl Transferase Level in Cigarette Smokers; Tanzania Journal of Natural and Applied Sciences, Vol, No2.