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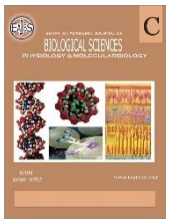

Measuring Some Vital Indicators in The Liver of People Without Breakfast Compared to The Control Group

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ABSTRACT

Breakfast is considered one of the necessary natural activities, as it works to relax the body, as the liver produces ketones in the body by using them as energy, and when you eat carbohydrates, your body will provide glucose and insulin. Glucose is the easiest atom for your body to diversify and use as a prebiotic, so it will be picked from a vital source of your body's energy.

The findings demonstrated that, as compared to the control group, there was no discernible variation in the LDL level in those who skipped breakfast. The findings also demonstrated a statistically significant variation in HDL levels between those who skipped breakfast and the control group.

The outcome showed that those who skipped breakfast had significantly lower haemoglobin levels "$P < 0.05$" than those in the control group. The outcome also showed that those who skipped breakfast had significantly lower platelet, red blood cell, and white blood cell counts "$P < 0.05$" than those in the control group. Additionally, the results showed that those who skipped breakfast had significantly lower AST and ALT levels "$P < 0.05$" than those in the control group.

Based on the study findings, we draw the conclusion that eating natural food at regular intervals has a noticeable physiological impact on those who skip breakfast in comparison to the control group, which is what caused harm to the liver and other bodily organs' levels and activities.

INTRODUCTION

In nutritional research, biomarkers are frequently employed to evaluate food consumption. Generally speaking, these markers could be able to assist in resolving some of the methodological issues that arise from the use of artificial meals in food science (Herrero *et al.*,2012). However, non-food variables such as genetic background, smoking, obesity, physical activity, and metabolism may have an impact on their capacity to reflect dietary consumption (Klein *et al.*,2004 and Zhu *et al.*, 2004). Due to the significant role fatty acids play in the onset of chronic illnesses, biomarkers of particular fatty acids have found widespread use (Simopoulos,1999 and Fritsche,2015). Since individual fatty acids may be tested in a variety of easily accessible tissues, such as red blood cells, plasma, and adipose tissue, evaluation in epidemiological research is made simpler (Hodson *et al.*, 2008). Triacylglycerols predominate in fatty acid measurements in lipids in these tissues, phospholipids are represented by red blood cells, and a combination of triacylglycerols, cholesterol esters, and phospholipids which are found in lipoproteins are represented by plasma (Ruiz-Gutiérrez *et al.*, 1992 andTholstrup *et al.*,2001).

The metabolic features of all these biological samples vary greatly, which is a significant disadvantage (Furtado *et al.*,2019). Certain tissues are more likely to represent physiological traits, whereas others are more likely to reflect dietary consumption. Interpreting the given data is challenging since there are few studies evaluating the capacity of various organs to predict nutrient intake (Karasov *et al.,* 2011) (Bearhop *et al.*,2006). Because of its slow turnover, adipose tissue is thought to be the best option for long-term studies of fatty acid intake (Arner *et al.*,2019). Liver function has to be prioritized since it is a vital organ in metabolism and has a significant role to play (Mazariegos *et al.*,2014). Because of the nature of body tissues and the difficulty of obtaining samples, adipose tissue biomarkers are used in epidemiological studies(Zaccherini *et al.*,2021). Fatty acids have been successfully evaluated in whole blood in relation to sudden death, but it is unknown if whole blood can accurately reflect intake for individual tissues in population studies (Mustieles *et al.*,2020). The liver function biomarkers "ALT, AST, and ALP" are utilized in the clinical diagnosis of a number of illnesses, including liver injury and malfunction (Xu *et al.*,2014). Prior case-control studies have demonstrated that elevated levels of certain combinations of these liver function biomarkers are independently linked to a number of diseases, such as hepatitis infection, cirrhosis, and bile duct obstruction (Hann *et al.*,2012 and Batta,2011). Approximately 90% of cases of diagnosed liver cancer also had elevated levels of liver-specific alkaline phosphatase (ALP) or bilirubin. Several liver enzymes, but not bilirubin, have been positively correlated with the likelihood of developing cirrhosis in other studies based on Asian populations with hepatitis (Žiberna *et al.*,2021 and Khan *et al.*,2023).

The aim of this study was to evaluate the effect of diet on the levels of some blood indicators in the liver of some people.

MATERIALS AND METHODS

Subjects:

Patients were chosen from Iraqi physical rehabilitation facilities located in the Najaf Governorate. 8/2016 to 2/2017 as dates.

Serum samples were taken from 60 patients with type 2 diabetes and 30 healthy individuals who served as controls. The age range of the research participants was 25–37 years old. Ninety samples in all were examined. All of the study's participants were willing participants who provided both verbal and written agreement.

Materials:

The immunological approach (enzyme-linked immunosorbent assay) was used to evaluate the levels of ALT, AST, HDL, and LDL cholesterol in the 90 samples using an ELISA reader (Huma is German in origin). Every biochemical test was carried out at the biology department's labs at the University of Kufa's College of Science and College of Biology.

RESULTS

The following figure discusses the findings of a study that examined the impact of breakfast consumption on high-density lipoprotein (HDL) levels in individuals (Fig. 1**).** The results indicated a significance "$P < 0.05$" in the HDL level in people without breakfast compared to the control group.

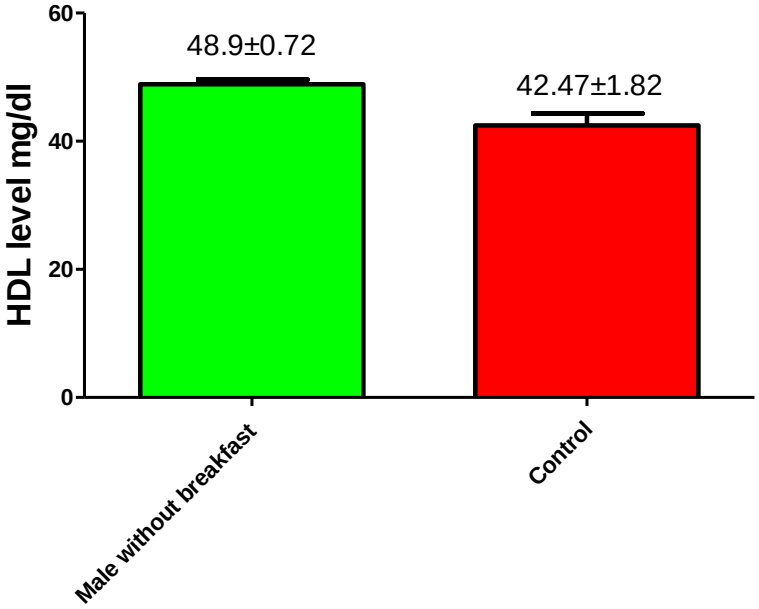

Fig.1: HDL level in control Group, people without breakfast compared to the control group significant "p<0.05".

The subsequent discourse delves into the outcomes of a study investigating the effect of breakfast omission on low-density lipoprotein (LDL) levels among individuals. Notably, the findings revealed a lack of statistical significance ($p < 0.05$) in LDL levels between individuals who skipped breakfast and those in the control group. This examination prompts further exploration into the nuanced relationship between breakfast habits and LDL cholesterol metabolism.The result indicated non-significant "p<0.05" in LDL in people without breakfast compared to the control group **(**Fig.2**)**.

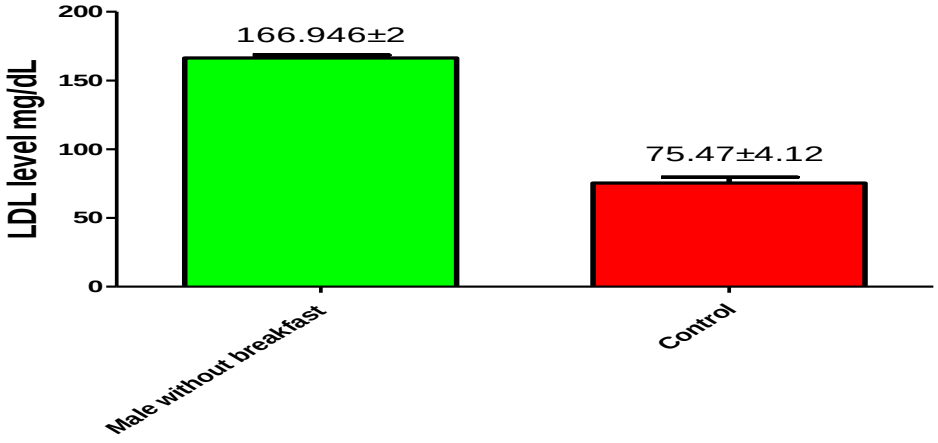

Fig. 2: LDL level in people without breakfast compared to the control group.

The following figure presents the findings of a study examining the impact of breakfast consumption on hemoglobin levels in individuals. Notably, the results revealed a statistically significant decrease ($p < 0.05$) in hemoglobin levels among participants who skipped breakfast compared to those in the control group. This observation underscores the potential influence of breakfast habits on hematological parameters and warrants further investigation into the relationship between breakfast skipping and hemoglobin

levels.The result indicated a significant decrease "p<0.05" in Hemoglobin levels in people without breakfast compared to the control group **(**Fig. 3**)**.

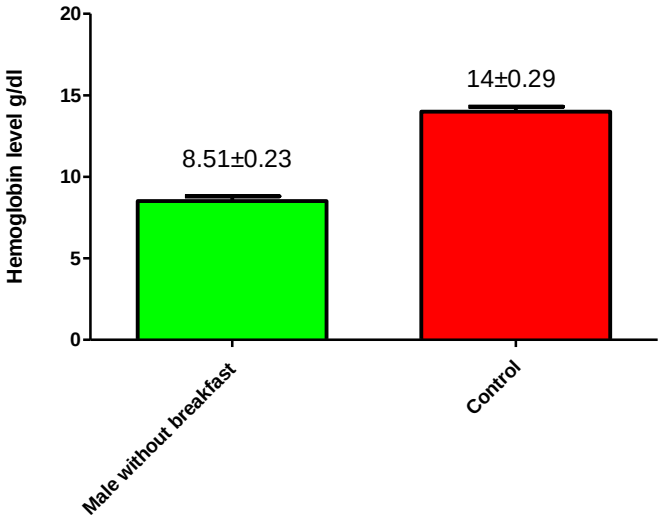

Fig. 3: Hemoglobin level in control Group, in people without breakfast compared to the control group.

The ensuing figure unveils the findings of a study probing into the influence of breakfast consumption on platelet counts among individuals. Notably, the results unveiled a notable statistical significance ($p < 0.05$) denoting a decrease in platelet count among individuals who skipped breakfast in comparison to those in the control group. This observation underscores the potential impact of breakfast habits on hematological parameters, particularly platelet count, prompting further exploration into the intricate relationship between breakfast omission and platelet levels.The result indicated a significant decrease "p<0.05" in platelets count in people without breakfast compared to the control group **(**Fig. 4**).**

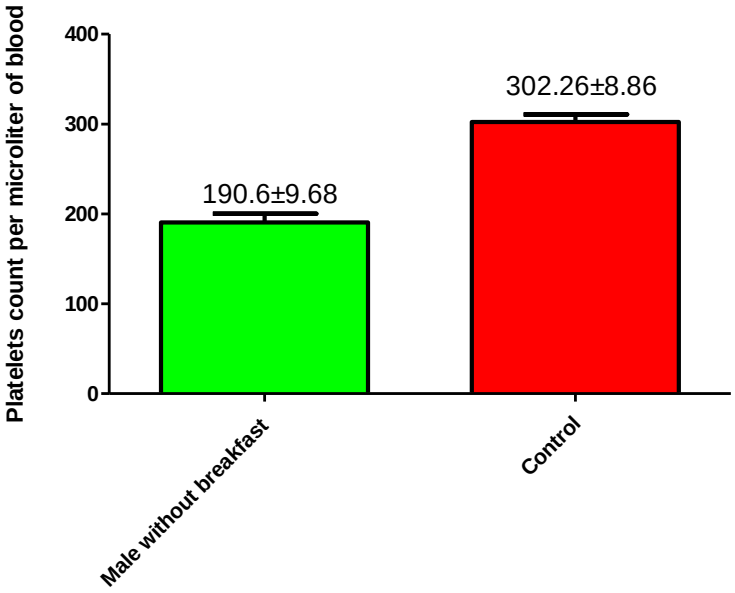

Fig.4: platelets count in control Group, in people without breakfast compared to the control group.

The forthcoming figure elucidates the outcomes of an investigation, as depicted in Figure 5, assessing the impact of breakfast omission on red blood cell (R.B.Cs) count among individuals. Notably, the findings unveil a substantial statistical decrease ($p < 0.05$) in R.B.Cs count among individuals who abstained from breakfast compared to those in the control group. This observation underscores the potential repercussions of breakfast habits on hematological parameters, specifically R.B.Cs count, prompting further inquiry into the intricate interplay between breakfast habits and red blood cell levels.The result (Fig. 5) indicated a significant decrease "p<0.05" in R.B.Cs count in people without breakfast compared to the control group.

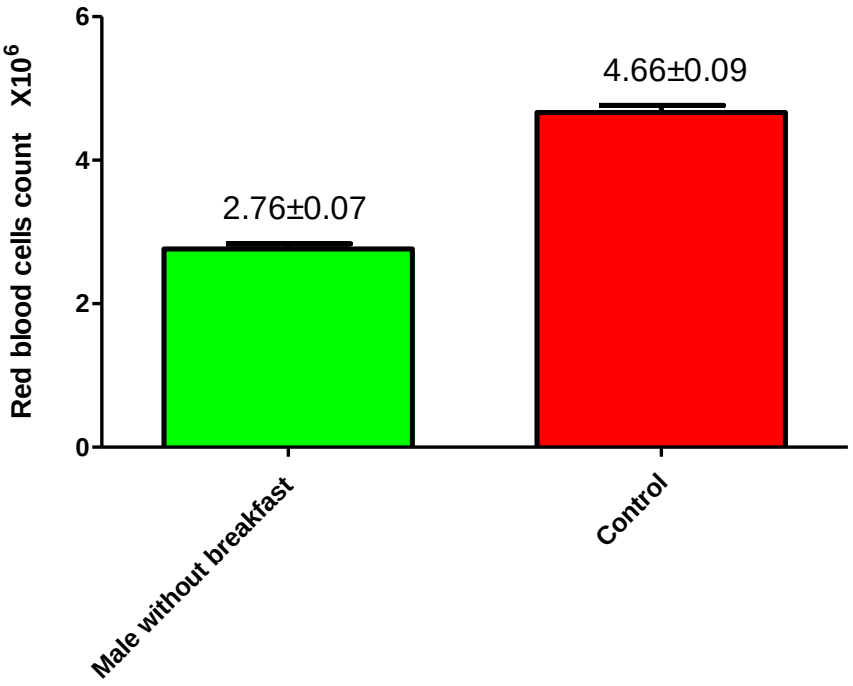

Fig. 5: R.B.Cs count in control Group in people without breakfast compared to the control group.

The following figuer delves into the findings of a study examining the impact of breakfast consumption on white blood cell (W.B.Cs) count among individuals. Notably, the results revealed a notable statistical decrease ($p < 0.05$) in W.B.Cs count among individuals who skipped breakfast compared to those in the control group. This observation highlights the potential influence of breakfast habits on immune parameters, specifically W.B.Cs count, prompting further investigation into the intricate relationship between breakfast omission and white blood cell levels.The result (Fig. 6**)** indicated a significant decrease "p<0.05" in W.B.Cs count in people without breakfast compared to the control group.

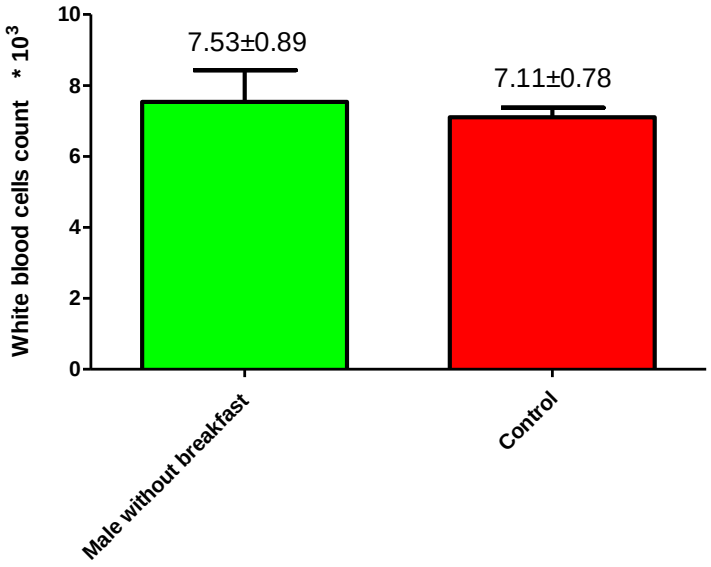

Fig. 6: W.B.Cs count in control Group in people without breakfast compared to the control group.

The subsequent figure delves into the outcomes of an investigation, as depicted in Figure 7, elucidating the impact of breakfast omission on alanine aminotransferase (ALT) levels among individuals. Notably, the results unveiled a significant statistical decrease ($p < 0.05$) in ALT levels among individuals who skipped breakfast compared to those in the control group. This observation underscores the potential influence of breakfast habits on hepatic parameters, specifically ALT levels, prompting further inquiry into the intricate relationship between breakfast omission and liver enzyme levels.The result (Fig.7) indicated a significant decrease "$p<0.05$" in ALT levels in people without breakfast compared to the control group

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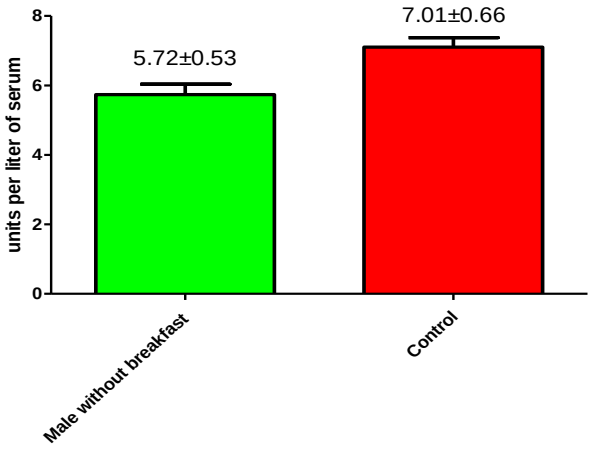

Fig.7: ALT level in control Group in people without breakfast compared to the control group

The forthcoming figure unveils the findings of a study examining the impact of breakfast consumption on aspartate aminotransferase (AST) levels among individuals. Notably, the results revealed a significant statistical decrease ($p < 0.05$) in AST levels among individuals who skipped breakfast compared to those in the control group. This observation highlights the potential influence of breakfast habits on

hepatic parameters, specifically AST levels, prompting further exploration into the intricate relationship between breakfast omission and liver enzyme levels.The result (Fig. 8**)** indicated a significant decrease "p<0.05" in AST level in people without breakfast compared to the control group.

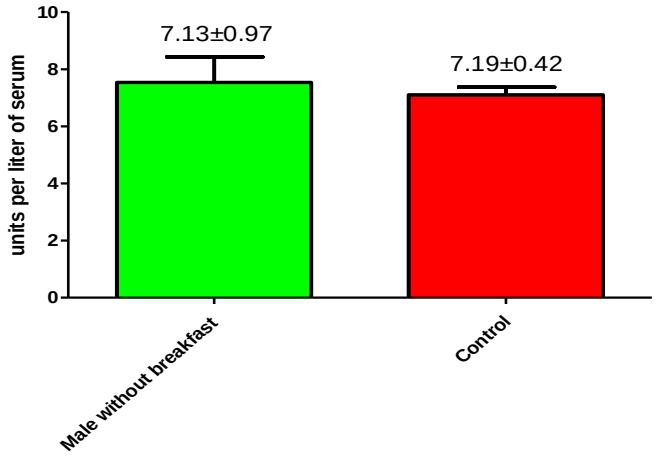

Fig. 8: AST level in control Group in people without breakfast compared to the control group

DISCUSSION

The findings indicate a noteworthy variation in LDL and HDL levels between the patients who skipped breakfast and the control group. This outcome is most likely The alterations might be caused by the metabolism increasing throughout the night or decreasing as a result of skipping breakfast (Lopez-Minguez *et al.*,2019).

In comparison to the control group, our current study's patients who skipped breakfast had lower levels of haemoglobin, white blood cells, and red blood cells. This finding suggests that dietary precautions taken by people may be the cause of these blood marker declines. Additionally, our investigation revealed that patients who skipped breakfast had lower blood values than those in the control group. It might be because of the detrimental impact on the rise in blood sugar levels. The impact of diet on the human body might potentially be the cause. (Thakur *et al.*,2021 and Anwar *et al.*,2021).

In contrast to the control group, our recent study revealed a drop in the AST and ALT in patients who skipped breakfast. This finding might be the result of These include a primary metabolic condition that results in steatosis, which is then followed by lipid peroxidation, oxidative stress, and the release of inflammatory cytokines that have a negative impact on liver function. (Fouda *et al.*,2021 and Behrouz *et al.*,2020).

Conclusions

It is concluded by the current study, that based on the findings of this study, patients with type 2 diabetes can benefit from a diet that has a good impact on their health when their levels of testosterone and vitamin D3 are normal compared to patients with the same condition who do not follow a ketogenic diet.

Recommendations

Through the results of our study, we recommend following the diet, and we advise researchers to measure several other parameters.

Declarations:

Ethical Approval: Protection of human and animal subjects. The authors declare that the procedures followed were in accordance with the regulations of the relevant clinical research ethics committee and with those of the Code of Ethics of the World Medical Association (Declaration of Helsinki).

Confidentiality of Data: The authors declare that they have followed the protocols of their work center on the publication of patient data.Right to privacy and informed consent. The authors have obtained the written

informed consent of the patients or subjects mentioned in the article. The corresponding author is in possession of this document.

Use of artificial intelligence for generating text. The authors declare that they have not used any type of generative artificial intelligence for the writing of this manuscript, nor for the creation of images, graphics, tables, or their corresponding captions.

Conflict of interests: The authors declare no conflict of interest.

Authors Contributions: I hereby verify that all authors mentioned on the title page have made substantial contributions to the conception and design of the study, have thoroughly reviewed the manuscript, confirm the accuracy and authenticity of the data and its interpretation, and consent to its submission.

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Availability of Data and Materials: All datasets analysed and described during the present study are available from the corresponding author upon reasonable request.

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