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Research article

Effects of sunflower seeds on LFT levels of patients with fatty liver (grade 1)

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Abstract

Objective: The present study was conducted with the aim to assess and analyse the effect of sunflower seeds on the serum LFT (Liver Function Tests). **Methods:** 60 patients were selected for the study (29 females and 31 males). The patients selected were divided into the case and the control group respectively. Various anthropometric measurements as like Height, Weight, Blood pressure and biochemical parameters as like LFTs (SGOT, SGPT) for these patients were recorded for 6 months pre and post supplementation of the sunflower seeds. **Results:** The patients that were being fed on the sunflower seeds showed a positive and a faster decrease in their LFT levels (both SGOT and SGPT). The SGOT AND SGPT levels were found to be decreased from 89.7 mg/dl to 38.4 mg/dl in the Case group and 37.6 mg/dl to 40.5 mg/dl in Control group. **Conclusion:** Sunflower seeds can be well recommended as a household and natural remedy to render control over the raised Liver enzyme levels in the blood serum which could otherwise lead Fatty Liver followed by Liver Damage.

Introduction

Fatty liver disease which is commonly known as fatty liver is a health condition that can be reversed, if in its initial stages. In this condition molecules of triglyceride or fat get deposited in the cells of liver as a result of steatosis, a process which includes abnormal deposition of fats in the cell. In simpler terms, fatty liver is a condition in which abnormally increased amounts of fat gets accumulated or deposited in the cells of liver. Fatty liver is considered to be the only health condition occurring in obese patients all around the world (without or with the effects of insulin resistance), especially in patients who are alcoholic. The condition also relatively influences the metabolism of fat in the body. Whenever the metabolism of fat is disturbed, accumulation fat takes place in the liver cells in large quantities, thus resulting in the health condition called fatty liver [1].

As a result of fat deposition in the liver a condition known as steatohepatitis occurs in some patient's i.e. relative inflammation of the liver (hepatitis). In cases where fatty liver occurs as a result of alcohol intake, the health condition is known as alcoholic fatty liver disease (AFLD) or steatosis. The other forms of fatty liver are termed as Non-alcoholic steatohepatitis (NASH) (if it is not due to alcohol) or alcoholic steatohepatitis [1].

The early symptoms of fatty liver include: fatigue, anorexia, loss of weight, weakness, lethargy, nausea, poor concentration and confusion. If not taken care on time it may proceed to critical conditions like cirrhosis of liver, Hepatic Coma, Hepatic Encephalopathy etc. These diseases possess clusters of fatal symptoms in it as it is [2].

Crunchy, Nutty and sweet, sunflower seeds prove to be an incredible source of calories, minerals, vitamins and essential fatty acids. The seeds are most commonly utilized in the extraction of edible oil at a commercial scale throughout the world. The seeds of sunflower can be consumed as a delicious snack [3].

Sunflower plant is an erect, herbaceous, tall annual plant belonging to the family of Asteraceae of the genus, *Helianthus*. The botanical name of the sunflower seeds is *Helianthus annuus*. The seeds first originated in the Middle American region. It is from this place that it escalated as an important commercial crop all over the world [3].

Delicious and crunchy sunflower seeds are widely appraised as great health food. They are high in calories and also an impressive source of health benefiting nutrients, vitamins, minerals, and antioxidants. A good amount of their calories come from the fatty acids. The seeds are specifically rich in PUFA i.e. poly-unsaturated fatty acid mainly linoleic acid, which contribute around 50% fatty acids in them. Oleic acid, a mono-unsaturated fatty acid (MUFA) is also found in good amounts in the seeds. Research studies suggest daily diet schedule with good amounts of MUFA prevent cardiac disorders and stroke by maintaining a healthy lipid profile [4].

Sunflower seeds like other nuts are also a rich source of proteins with high quality of amino acids such as tryptophan present in it. Tryptophan is essential for growth, especially in children. In addition to this, these seeds contain

health promoting poly-phenol compounds such as quinic acid, caffeic acid and chlorogenic acid. These contain certain natural anti-oxidants in it that help discard harmful oxidant molecules (in simpler terms toxins) from the body [4] [5].
Sunflower kernels are one of the richest sources of B-complex vitamins. Very precisely these are very good sources of niacin, folic acid, thiamin (vitamin B1), pyridoxine (vitamin B6), pantothenic acid, and riboflavin [6]. The seeds are also incredibly rich sources of many essential minerals. Iron, Zinc, Manganese, Copper, Selenium and Calcium are especially concentrated in sunflower. Many of these minerals play a vital role in hormone production, enzyme synthesis, red blood cell production, bone mineralization, as well as regulation of metabolic, cardiac and skeletal muscle activities [7].
In this study, the effects of sunflower seeds were studied on the LFT levels of patients with Fatty Liver Grade 1. The LFT evaluation includes – SGOT, SGPT Tests.

Experimental

Material and Methods

The sample of about 60 people (31 males and 29 females) was selected from Fortis Hospital Amritsar from the state of Punjab. The consent of the patients as well as the hospital authority was taken for the respective study. The age of the sample patients varied from 45-55yrs (sample patients selected under the knowledge of the administration). The sample was divided into two groups- control and case group (30 people in each group); where the control group was only given the required diet counseling whereas the case group was fed on 2 gm sunflower seeds per day along with the required diet counseling [8].
The pre- supplementation data in both the cases was collected with the help of a dietary survey, anthropometric measurements, biochemical testing which comprised of their diet history, diabetes history, height chart, BMI, FBS [9].
The sunflower seeds slightly roasted for about 2 minutes were fed to the control group for a period of 6 months. The pre and post supplementation data was recorded and the various biochemical parameters were checked at each month's end. The data collected was put to statistical analysis using SPSS software and unpaired t-test to find out the result [10].

Result and Discussion

Closely observing the graphs attached at the end it gives a view how the case group (the ones being fed with sunflower seeds) shows a better decrease in the levels of SGOT (Control group 76.2 mg/dl to 43.7 mg/dl; Case group 89.7 mg/dl to 38.4 mg/dl) as shown in Figure 1. And observing Figure 2 it is showed that a even a better decrease in the levels of SGPT (Control group 137.7 mg/dl to 57.2 mg/dl; Case group 139.9 mg/dl to 49.4 mg/dl) occurs in the Case group than as compared to the control group

Applying the simple paired t-test using SPSS Software the following results were achieved.

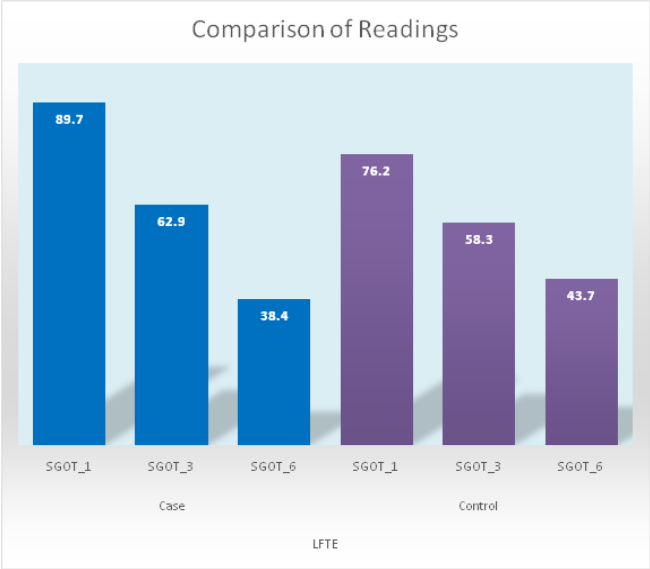

Figure 1. The comparison between the control and case group showing the mean of the values of SGOT

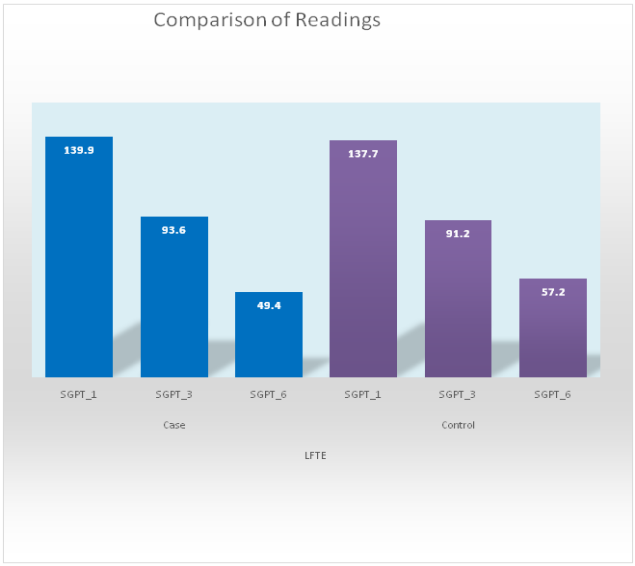

Figure 2. The comparison between the control and case group showing the mean of the values of SGPT

In table 1 (Case group), as per attached to the end of the manuscript for SGOT the p-value comes out to be 0.000 (< 0.05), for SGPT it comes out to be 0.009 (< 0.05) making these values significant. In table 2 (Control group) for SGOT and SGPT the p-value comes out to be 0.000 (< 0.05), hence making it significant.
However, the result of decrease in the SGOT and SGPT levels in both males and females was also recorded separately. Applying the simple arithmetic mean the average of decrease in SGOT levels in males was 32.6 gm/dl and in females was 31.5 gm/dl, which is quite close. And the average decrease in the SGPT value came out to be 82.8 gm/dl in males, whereas in females it came out to be 76.6

gm/dl respectively. Here, the value of the mean decrease in SGOT comes out to be quite close in both males and females but better decease in the SGOT values is found in males as compared to the females.

As per the results the sunflower seeds have proved to show a positive and a better effect in reducing the Liver Function Tests in patients with Fatty Liver grade-1. Just half a spoon of sunflower seeds every day provides the recommended level of proteins, vitamins, minerals and phenolic anti-oxidants [5].

Table 1. The case and control group with the relative readings

Group	Experiment		Experiment	
Variable	SGOT		SGPT	
PRE/POST	Pre	Post	Pre	Post
Mean	89.73	38.43	139.90	49.40
Mean Height	Males			
Mean Weight				
Mean Blood Pressure				
S.D.*	18.160	3.245	33.816	3.480
Mean Difference	51.30		90.50	
Number	30	30	30	30
SE**	3.043		5.761	
T Paired Test	16.859		15.710	
P value	0.000		0.000	
Table Value at 0.05 df 29	2.05		2.05	
Result	Significant		Significant	

Table 2. The case and control group with the relative readings

Group	Control		Control	
Variable	SGOT		SGPT	
PRE/POST	Pre	Post	Pre	Post
Mean	76.23	43.73	137.73	57.20
S.D.*	18.311	3.796	34.673	4.089
Mean Difference	32.50		80.53	
Number	30	30	30	30
SE**	2.920		5.819	
T Paired Test	11.129		13.840	
P value	0.000		0.000	
Table Value at 0.05 df 29	2.05		2.05	
Result	Significant		Significant	

NOTE: S.D= Standard Deviation, *- Significant, **- Non Significant, n=60 (30 case, 30 control)

SGOT: Serum Glutamic Oxaloacetate Transaminase, SGPT: Serum Glutamic Pyruvate Transaminase

Table 3. Mean Height, Weight and Blood Pressure of the sample patients

	Males	Females
Mean Height	172.4	155.3
Mean Weight	82.5	65.9
Mean Blood Pressure	120.5/97.6	128.1/87.2

The quantity of sunflower seeds used in the present study (2gm). Sunflower seeds have about 3 grams of fiber and 5 grams of protein in an ounce of kernels apart from the other benefits [7]. Thus, a small amount of sunflower seeds taken on a regular basis say being added on top of salads, in the vegetable mixtures, in oats or other cereals or can be taken as it is as a health snack (in moderation).

Conclusion

The crunchy, nutty and delicious sunflower seeds are highly considered to be a great health food. They are energy dense seeds; 100 g seeds provide about 584 calories. Along with this, they are phenomenal source of health benefiting antioxidants, minerals, vitamins and nutrients. Sunflower Seeds with a mild nutty taste and a wide range of the above mentioned nutrients can serve as a filling as well as a nutritious food. With respect to the gathered results in the study, sunflower seeds can be recommended as a great household and a natural remedy to render control over the Liver Enzymes: SGOT and SGPT and thus help in progression of Fatty Liver Grade1 to Grade 2.

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