

# Flaxseeds: Impact on Biochemical Parameters of Diabetic and Hyperlipidemic Patients

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## ABSTRACT

Diabetes is a chronic illness and hyperlipidemia can be a complication of disease that requires a combination of pharmacological and nutritional measures for better glycemic control (American Diabetes Association, 2009). Patient's adherence to medication and lifestyle modification plays an important role in diabetes and hyperlipidemia management.

This study was conducted on the patients suffering from diabetes as well as hyperlipidemia, to assess the impact of flaxseed consumption. The sample consisted of 50 patients (suffering from both diseases).

An estimation of lipid profile and blood sugar level of the patients before and after consuming the raw flaxseed powder (10 gms) early morning once a day for 45 days was done. The pre and post trial data was compared for cholesterol, HDL, VLDL, LDL, triglycerides, fasting and post-prandial blood sugar.

The result revealed that consumption of flaxseeds significantly reduced the total cholesterol levels and increased the HDL levels of the patients.

## Introduction

India leads the world with largest number of diabetic subjects and is known as "Diabetes Capital of World" (Rakesh Malik, 2016). Diabetes is the condition where the amount of glucose in the blood is too high because pancreas does not produce enough insulin to help glucose enter the body cells or the insulin that is produced does not work properly (Insulin resistance).

Another major problem the world is suffering is *Hyperlipidemia* (Diabetes & Endocrinology Center, 2012). Hyperlipidemia is a family of disorders that is characterized by abnormally high levels of lipids (fats) in the blood. While fats play a vital role in the body's metabolic processes, high blood levels of fats increase the risk of coronary heart disease (Michael A. Chen, 2016).

Many researches highlight that flaxseeds helps in lowering the cholesterol levels (Pan A. et al., 2009). It is a product with high fiber and is rich in variety of nutrients. One of these +nutrients is, *Alpha-linolenic Acid*, which is a type of polyunsaturated fat. Specifically, it belongs to the omega-3 fatty acids, found in fish and is cited very high in promoting heart health through lowering cholesterol levels and reducing blood clotting. It

also contains substances called *Lignans*, which are antioxidants that may help in the prevention of atherosclerosis induced by oxidative stress (Kailash Prasad, 2009).

## Objectives

- To study the impact of flaxseed on the blood sugar profile of hyperlipidemic and diabetic patients.

## Hypothesis

Ho1 No significant differences will be observed in the blood sugar profile of patients before and after consumption of flax seeds.

## Methodology

**Sampling Design-** Purposive sampling method was used in the study to select the sample from the patients (hyperlipidemics and diabetics) so as to identify the patients interested in consumption of flaxseeds.

**Locale-** The data was gathered from many hospitals and clinics of UP district, of India.

**Data collection-** The values of all biochemical parameters were recorded before and after intervention with the consent of the patients.

- Collection of baseline data from the sample- biochemical parameters.
- 10g of freshly ground flaxseeds, was provided to consume empty stomach daily, with a glass of water.
- Comparing the biochemical parameters of the respondents, after 45 days of consumption.

## Results

**Mean values of Blood Sugar levels and Cholesterol levels (increase/ decrease after intervention)**

Parameters	Pre-test value	Post-test values	Reduction/ Increase (in %)
FPG (mg/dl)	472.05	363.59	22.9
PPG (mg/dl)	577.59	451.05	21.9
Total Cholesterol (mg/dl)	504.28	437.41	13.2
LDL (mg/dl)	213.46	202.37	5.1
VLDL(mg/dl)	115.45	149.61	29.58
HDL(mg/dl)	78.3	88.74	13.3
Triglycerides (mg/dl)	276.53	339.49	22.76

A reduction of 23 percent was observed in Post-test FPG values and 22 percent Post-test PPBS values post consumption of flaxseeds. Similarly, the total cholesterol, VLDL, LDL, triglycerides levels reduced by 30%, 5% and 23% post consumption of flaxseeds. On the other hand, the HDL levels increased by 13 % post consumption of flaxseeds.

## Conclusion

It is hence concluded that flaxseeds reduce the bad cholesterol and increase the good cholesterol. It helps in maintaining the blood sugar levels. Continuous education programs and counseling should be conducted for diabetic and hyperlipidemic patients. Inclusion of flaxseeds in the diet of patients is very beneficial so as to manage the blood sugar levels, as well as, to maintain the cholesterol levels.

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