

# Research on ProPection effect on patients with Diabetes type 2

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## Introduction

High blood levels of glucose, cholesterol and lipid disbalance present the highest risk factor for cardiovascular disease, diabetes, malignancy, indigestion and other diseases.

Each year the number of people suffering from Diabetes Type 2 increase and the disease causes 3 000 000 deaths every year. Bulgaria is also affected by this tendency.

Changes in the diet and way of life may prevent diabetes type 2 or alleviate the condition of people that already suffer the disease. Pectin is naturally distributed polysaccharide that in recent years has gained a broad application and importance due to its qualities as a bio-regulator.

The purpose of this study is to follow the effect of ProPectin on volunteers with different blood levels of glucose and cholesterol. The volunteers were administered Propectin for 16 weeks.

## Materials and Dosage

The study participants were administered 3 times per day ProPectin (a solution containing highly esterified apple pectin) over a course of 112 days.

## Protocol of the study

The research was conducted on two stages on 15 volunteers divided into 3 groups.

The first group consisted of 5 people (3 women and 2 men) with cholesterol levels above 6 mmol/ l., and blood glucose  $\geq 7,3$  mmol/ l/. One of the volunteers is a smoker,

The second group had normal cholesterol levels ( to 4,9 mmol/ and blood glucose  $\leq 5.6$ mmol/l /. This group consisted of 5 healthy volunteers (3 women and 2 men). Two are smokers.

The third group consisted of 5 volunteers / 3 women and 2 men/ with cholesterol levels upon 6,2 mmol/ l and blood glucose  $\geq 7$  mmol/. One of the volunteers is a smoker.

All volunteers were at age between 45 and 75. All volunteers were over weight.

## Method

The first stage continued 8 weeks. All volunteers were placed on the same diet regime done according d-r Fedon Lindberg diet, Norway. This is balanced diet with low glycemic index food with low glucose level and up to 330 mg. cholesterol. ProPectin was not administered. The diet was followed through all stages.

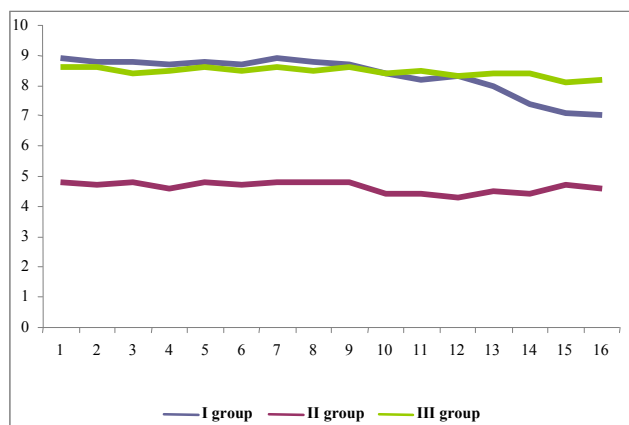
The second stage continued 8 weeks. Only the first two groups were administered 3 times per day ProPectin.

Volunteers from the third group were not administered ProPectin.

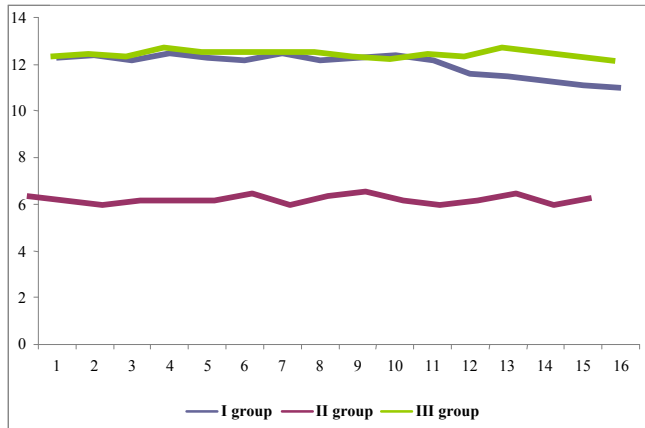
## Analysis of the Data and Results

ProPectin Effectiveness was traced by monitoring blood glucose levels and HbA1c.

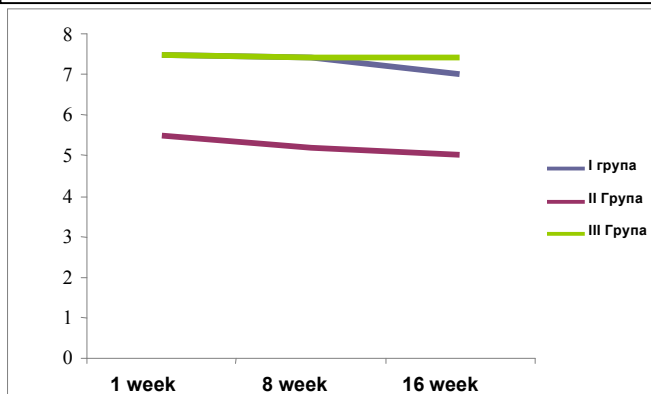
Figure 1 Average blood glucose level (tested at hungry)



**Figure 2 Average blood glucose level (tested 2 hours after meal)**



**Figure 3 Average HbA1 level tested in %**



It was reported that at the first 8 weeks there was no significant change in blood glucose levels, HbA1c, cholesterol, LDL, HDL and triglycerides. At some of the volunteers blood glucose levels under 2.3 mmol/l were inspected – cases of hypoglycemia. After ProPectin was administered at the second stages there were no hypoglycemia cases registered. At the group that was not administered ProPectin there was no significant change at the levels of blood glucose and HbA1. That assured ProPectin effectiveness.

Only 4 months after ProPectin was administered a reduction with 0.5 % of HbA1c was reported.

With the same diet and medicamentation treatment a serious diminish of levels of blood glucose, cholesterol, LDL and tryglycerides was registered after the ninth week in the first group. The reason was ProPectin treatment. The diminish of cholesterol in the first group was higher within women.

Within the end of week 9 a diminish of the blood pressure level was registered at part of the volunteers from the first group that suffered high blood pressure. At all volunteers from the first group a diminish of cholesterol levels was registered.

**Table 1**

Period	Cholesterol		LDL		Triglycerides	
	First group	Control	First group	Control	First group	Control
beginning	6,7 mmol/ l	4,2 mmol/ l	5,1 mmol/ l	2,7 mmol/ l	2,6 mmol/ l	1,8 mmol/ l
8 th week	6,6 mmol/ l	4,1 mmol/ l	4,9 mmol/ l	2,6 mmol/ l	2,6mmol/ l	1,8 mmol/ l
12 th week	6,2 mmol/ l	4,1 mmol/ l	4,6 mmol/ l	2,6 mmol/ l	2,5 mmol/ l	1,8 mmol/ l
16 th week	6,0 mmol/ l	4 mmol/ l	4,2 mmol/ l	2,5 mmol/ l	2,4 mmol/ l	1,8 mmol/ l

\*The amounts for the individual groups are averaged.

At the time of the study, a biochemical analysis of the electrolytes in the blood was conducted and no significant changes were reported in their values.

**Table 2**

Period	Cholesterol		LDL		Triglycerides	
	First group	Third group	First group	Third group	First group	Third group
beginning	6,7 mmol/ l	6,4 mmol/ l	5,1 mmol/ l	5,0 mmol/ l	2,6 mmol/ l	2,4mmol/ l
8 th week	6,6 mmol/ l	6,3 mmol/l	4,9 mmol/ l	4,9 mmol/ l	2,6mmol/ l	2,3 mmol/ l
12 th week	6,2 mmol/ l	6,4 mmol/ l	4,6 mmol/ l	5,0 mmol/ l	2,5 mmol/ l	2,4mmol/ l
16 th week	6,0 mmol/ l	6,4 mmol/ l	4,2 mmol/ l	5,0 mmol/ l	2,4 mmol/ l	2,4mmol/ l

\* The amounts for the individual groups are averaged.

Based on the diet all 3 groups registered weight reduction. In the first two groups who were administered ProPectin the reduction was higher.

**Conclusion:**

Combining ProPectin and comprehensive diet regime in the therapy for Diabetes Type 2 will diminish the complications of the disease. ProPectin use leads to reduction in blood glucose levels, HbA1c, cholesterol and LDL.

Combining ProPectin and a diet regime in the therapy for Diabetes Type 2 leads to a healing effect in human body.

Based on the conducted study ProPectin can be used for prevention purposes also.

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