https://doi.org/10.37723/jumdc.v15i4.1072

J. Univ. Med. Dent. Coll.2024;Vol.15(4): 959-961
ISSN (Print) 2221-7827, ISSN (Online) 2310-5542
https://www.jumdc.com

Case Report

Open Access

Effect of the synthesit dietary supplement on serum cholesterol levels

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ABSTRACT

The present case report investigates the influence of Synthesit dietary supplements on serum cholesterol levels in a 69-year-old male patient with dyslipidemia from Sevastopol, Russia. During the observation period, the patient's cholesterol levels initially decreased after he began taking Synthesit. However, this was followed by a slight increase in cholesterol levels as the supplement regimen continued. The results indicate that Synthesit has an inconsistent effect on cholesterol; it lowers it at first and then causes a small increase over time. This case underlines the need for further studies to explore the long-term effects of Synthesit on cholesterol management and its possible implications for dyslipidemia treatment strategies.

KEYWORDS: Dietary Supplement, Synthesit, Serum Cholesterol, Clinical Significance, Cholesterol Balance.

INTRODUCTION

Cardiovascular diseases are the most common cause of death, thereby having significant impacts on public health as well as the global economy [1]. The primary cause of fatalities worldwide is cardiovascular disease, which was responsible for 32% of all deaths globally in 2019 equivalent to an estimated 17.9 million lives lost. In these cases, heart attacks and strokes accounted for over 85% of such deaths. Additionally, more than three-quarters of CVD-induced fatalities are observed within low- and middle-income countries [2].

The role iron plays in lipid reduction is complex and involves intricate connections between iron metabolism and lipid pathways. Cellular health relies on appropriate quantities of iron since it is harmful when present in excessive or insufficient amounts. Iron is associated with lipid pathways, thus an imbalance in iron levels may greatly impair lipid metabolism. Furthermore, this points out that systemic iron dysregulation leads to altered lipogenic pathways resulting in diseases like neurodegeneration [3]. When too much iron accumulates, it triggers the synthesis of cholesterol and boosts programmed cell death susceptibility that consequently establishes connections between lipid metabolism and the level of iron in the body [4].

The interaction of these processes demonstrates links between iron, glucose, fat metabolism, and obesity meaning that increased or decreased deposition of irons is related to metabolic disorders such as type 2 diabetes and hyperlipidemia [5].

Lipid metabolism is changed by iron and it also reduces oxidative stress that neutralizes them. At Imperial College London, a study was conducted that revealed an association between elevated levels of ferritin in the blood with reduced chances of suffering from conditions associated with high cholesterol levels and low likelihood of developing atherosclerosis. Blood gets oxygen from the lungs through arteries' endothelial walls which need appropriate amounts so it can pass across capillary walls into tissues; this makes it important for blood vessels supplying oxygen-carrying red cells called erythrocytes to be healthy.

It is also a catalytic or an oxidative event, which could damage cells by developing free radicals. When iron is absorbed from the gut, it is then released into blood bloodstream via transferrin which transfers it to the systemic circulation. Excessive iron goes into ferritin as storage. Serum ferritin is a useful clinical marker for determining iron levels and therefore plays a vital role in iron homeostasis. Abnormally high SF levels have been associated with dyslipidemia according to studies. Increased inflammatory cytokines are produced by lipid peroxidation and these interact with insulin resistance leading to changes in cholesterol metabolism which result in the growth of several chronic diseases including type 2 diabetes. Therefore, excessive accumulation of this element may increase cardiovascular disease risk, a major cause of hyperlipidemia [6].

How to cite this: *Kusnir P, Baig S .Effect of the synthesit dietary supplement on serum cholesterol levels. Journal of University Medical & Dental College. 2024;15(4):959-961.*

However, iron deficiency lowers the concentration of iron and ferritin in the blood and hinders the production of red blood cells [7]. Multiple investigations, conducted on both animals and people, have shown a connection between iron deficiency anemia and changes in the composition of blood. Following iron treatment, there was a notable reduction in serum triacylglycerols and very low-density lipoproteins. Anemia is linked to a higher likelihood of long-term consequences such as cardiovascular events and mortality in overweight and obese people. Both excessive bodily iron levels and iron deficiency have detrimental effects on health [8].

Increased amounts of lipids in the bloodstream heighten the likelihood of developing atherosclerosis and coronary heart disease. Lipids are hydrophobic organic molecules that have low solubility in water but high solubility in organic solvents [9]. These compounds are fatty acid esters that often lack alcohol or phosphate functional groups. They include triglycerides, phospholipids, and steroids. The human body needs a variety of beneficial lipid fats to sustain the proper functioning of its components. Consequently, significant emphasis is placed on aberrant lipid levels and the variables related to it [10]. This study intends to explore the correlation between dietary iron supplementation and serum lipid profiles, considering the limited amount of literature available on this topic.

CASE REPORT

Mr. Ivan Petrov, a 69-year-old male from Sevastopol, Russia, presented with dyslipidemia, marked by elevated serum cholesterol levels. Dyslipidemia is a common metabolic disorder associated with an increased risk of cardiovascular diseases, making its management crucial for overall health.

In September 2022, Mr. Petrov's cholesterol level was measured at 6.7 mmol/l, surpassing the normal range. Concerned about his health, Mr. Petrov sought interventions to address his dyslipidemia. In November 2022, he initiated the consumption of synthesit, a dietary supplement, intending to manage his condition. He adhered to the supplement regimen for one month before discontinuing its use.

Upon initial assessment, the General physical examination indicates that Mr. Petrov has typical signs associated with dyslipidemia such as obesity, especially central adiposity. As a result, his pulse, blood pressure, and respiratory rate were all within normal limits and he did not manifest any sign of peripheral vascular disease or other cardiovascular complications.

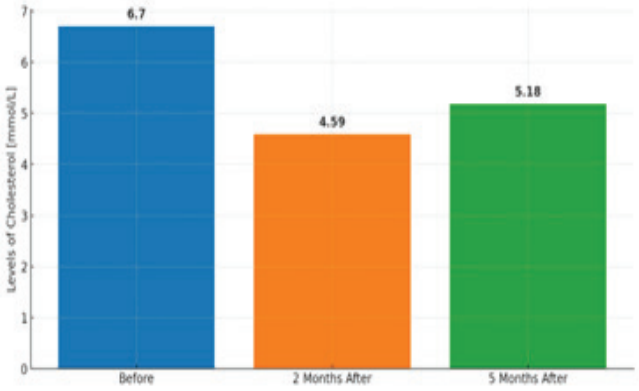
By February 2023, after cessation of synthesit use Mr. Petrov went for another check-up where his serum cholesterol was re-evaluated. The analysis revealed a significant decline in his cholesterol levels which had dropped to 4.59 mmol/l falling within the normal range. Interestingly, no major changes were made in factors concerning Mr. Petrov's lifestyle during this time suggesting that it could only be accounted for by the synthesit dietary supplement in relation to the reduction observed in serum cholesterol levels.

Figure-I illustrates the changes in Mr. Petrov's cholesterol levels before and after taking synthesit. The x-axis represents the time points of cholesterol measurements: "Before," "2 Months After," and "5 Months After" initiating synthesit. The y-axis indicates cholesterol levels measured in millimoles per liter (mmol/l). The plot demonstrates a reduction in cholesterol levels from 6.7 mmol/l before taking synthesit to 4.59 mmol/l two months after starting the supplement.

However, by the five-month mark after discontinuing synthesit, cholesterol levels slightly increased to 5.18 mmol/l. This figure visually depicts the impact of synthesit on cholesterol levels, showing an initial significant reduction followed by a slight increase over time. The exact mechanism that makes synthesit effective in treating dyslipidemia still remains unknown although some people have suggested that its citrate iron component might have something to do with controlling cholesterol levels.

This case study on Mr. Petrov further shows how important synthesit as a supplement is in managing dyslipidemia. That there was a significant drop in serum cholesterol following its consumption speaks volumes about its potentiality when it comes to therapeutic remedies for individuals who are affected by exaggerated high cholesterol cases though more studies should be conducted to affirm this and establish how exactly it works. The purpose of this study is to give synthesit dietary supplements to patients with dyslipidemia and observe the changes that will occur in the levels of serum cholesterol during a certain period.

Figure-I: Cholesterol changes before and after taking synthesit.



DISCUSSION

The effects of synthesit on cholesterol levels over time show an initial decrease from 6.7 mmol/l to 4.59 mmol/l after 2 months, followed by a slight increase to 5.18 mmol/l at the 5-month mark. Similar results are shown in another study indicating balancing cholesterol synthesis and absorption is crucial for maintaining optimal levels. Inhibitors of synthesis and absorption, like statins and ezetimibe, effectively lower LDL cholesterol concentrations by different mechanisms,

contributing to overall cholesterol balance [11]. Additional research indicates that patients who have elevated levels of cholesterol production and absorption have a more favorable response to statins.

This underscores the possible need for combination treatment using cholesterol absorption inhibitors in certain instances. This would also inform the development of personalized approaches to controlling cholesterol levels by understanding the relationship between cholesterol production, absorption indicators, and lifestyle variables. Furthermore, dietary factors like the consumption of cholesterol may affect cholesterol levels and how the body responds to treatment [12].

ACKNOWLEDGEMENT: We would like to, in particular, express our gratitude and appreciation to all those who took part in this research. Invaluable help and consideration received from them have added to the counting effectiveness of this particular study.

CONFLICT OF INTEREST: None.

GRANT SUPPORT AND FINANCIAL DISCLOSURE: None.

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Authors' Contribution:

Patrik Kusnir : Designed the study and collected the data.
Shahbaz Baig : Analysis and interpretation of data for the work.

Submitted for publication: 30-07-2024
Accepted after revision: 01-10-2024