

Effect and Tolerability of a Nutraceutical Supplement Based on Synergic Effect of Plants, Vitamins and Mineral for the Maintenance of Normal Cholesterol Levels: A Multicentric, Observational, Case Series

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Abstract

Background: Hypercholesterolemia remains a major risk factor for cardiovascular disease, which continues to represent one of the leading causes of mortality worldwide. Although statins are the first-line pharmacological therapy, nutraceutical formulations containing plant extracts combined with vitamins and minerals are increasingly used as complementary strategies for lipid profile modulation. This case series investigates the effects of the nutraceutical supplement IMOpro Cholequil® on cholesterol modulation in a small cohort of patients. **Methods:** This case series included 8 adults (four men, four women; age range 38 - 82 years) with abnormal total cholesterol levels at baseline (day 0) who presented to a pharmacy or their primary care physician. All subjects were recommended one nutraceutical supplement tablet once a day for a period of 90 days. Total cholesterol, HDL, and LDL levels were assessed at baseline, day 30, and day 90. **Results:** All patients showed a clinically relevant improvement in total cholesterol levels after 30 and 90 days of nutraceutical supplementation. **Conclusion:** Supplementation with a nutraceutical formulation containing synergistic plant extracts, vitamins, and minerals was associated with normalization or improvement of total cholesterol, LDL cholesterol, and triglyceride levels. Larger controlled studies are warranted to confirm these findings.

Keywords

Total Cholesterol, IMOpro Cholequil®, Synergic Effects, Plants, Vitamins, Minerals

1. Introduction

The modern nutraceutical approach to cardiovascular and metabolic health no longer relies solely on single isolated compounds but instead exploits the synergistic interaction between phytocomplexes, vitamins, and minerals to provide multidimensional metabolic support [1].

Several medicinal plants, such as berberine and bergamot, act directly on biological pathways involved in lipid synthesis and intestinal lipid absorption, while vitamins and minerals function as essential metabolic cofactors and antioxidant protectants [2]. B-complex vitamins and antioxidant molecules such as coenzyme Q10 may enhance the biological activity of plant extracts by stabilizing cell membranes and preventing lipid oxidation, whereas minerals such as chromium contribute to the optimization of energy metabolism [3].

This integrated formulation does not simply combine the effects of individual components; rather, it creates a coordinated metabolic network capable of modulating lipid profiles in an effective and well-tolerated manner. Such synergy may allow the use of lower doses of individual compounds while improving the overall metabolic response [4].

Hypercholesterolemia, defined as elevated circulating cholesterol levels, represents one of the major risk factors for cardiovascular disease. When total cholesterol and low-density lipoprotein (LDL) cholesterol exceed recommended levels, therapeutic intervention becomes necessary to reduce the risk of atherosclerosis and its complications [5].

In addition to lifestyle modification, balanced nutrition, and pharmacological therapy, supplementation with plant-derived compounds, vitamins, and minerals has been proposed as a complementary strategy for lipid profile improvement, as reported in the scientific literature [6].

Statins remain the primary pharmacological treatment for dyslipidemia. However, some patients are unable or unwilling to use statins because of intolerance, concerns about adverse effects, potential drug interactions, or reluctance toward long-term pharmacological therapy [7] [8].

The clinical rationale for multi-component nutraceutical supplements lies in the synergistic action of their ingredients, which target different pathways involved in lipid metabolism [9]. Monacolin K exerts an effect similar to statins by inhibiting endogenous cholesterol synthesis, whereas compounds such as policosanols and plant sterols may reduce intestinal cholesterol absorption and enhance bile acid excretion.

This pleiotropic mechanism can result in significant reductions in total and LDL cholesterol levels using relatively low doses of individual components, po-

tentially minimizing adverse effects such as myopathy or liver enzyme elevation that may occur with high-dose pharmacological therapy. Furthermore, antioxidant compounds such as polyphenol-rich extracts may play a crucial role in preventing LDL oxidation [10].

Oxidized LDL particles are strongly implicated in endothelial dysfunction and foam cell formation; therefore, limiting LDL oxidation represents an important therapeutic target in slowing the progression of atherosclerotic plaque formation.

2. Methods

The subjects included in this clinical observation consulted their physicians because their total cholesterol levels were above the recommended range, but they preferred not to initiate pharmacological lipid-lowering therapy. Their concerns included possible adverse effects, drug-drug interactions, and uncertainty regarding long-term pharmacological treatment.

The patients included in this observational cohort did not present with significant comorbidities and were not receiving concomitant treatments for other pathological conditions or other lipid-lowering measures during follow-up. Instead, they requested an integrative therapeutic approach capable of modulating cholesterol and triglyceride levels while minimizing the risk of treatment-related adverse reactions.

During the 90-day observation period, any potential concomitant treatments were monitored. In this cohort, no additional lipid-lowering medications were required, as the primary nutraceutical intervention was sufficient to maintain lipid profile stability throughout the study period.

Observation of these outcomes in a real-world clinical setting, as described in this case series, highlights the importance of a patient-centered therapeutic approach. Collaboration with general practitioners facilitates a structured transition from diagnosis to management, ensuring that patients receive supervised treatment and appropriate follow-up. Such an integrated model may improve clinical outcomes, enhance health literacy, and increase treatment adherence [11].

In an era characterized by increasing “statin hesitancy”, the availability of well-formulated nutraceutical alternatives may represent a valuable tool for cardiovascular risk reduction in primary prevention.

Participants were instructed to take one tablet daily for at least 90 consecutive days of the nutraceutical supplement IMOpro Cholequil® containing the following components: Bergamot dry extract 300 mg, Berberine 85% 176.47 mg, Fenugreek dry extract 100 mg, AmaChol® 100 mg, Monacolins (titrated to 5%) 2.99 mg, Moradyn® 50 mg, Coenzyme Q10 10 mg, Policosanol 90% 10 mg, Astaxanthin 5% 10 mg, Vitamin B6 1.6 mg, Folic Acid 400 µg, Chromium 40 µg, and Vitamin B12 2.5 µg.

3. Results

The data demonstrate promising results in terms of total cholesterol reduction after

90 days of treatment with IMOpro Cholequil® (one tablet daily for 90 consecutive days).

Analysis of Treatment Results

The mean values for the sample of eight patients (four men and four women; mean age 61 years) were as follows:

Measurement 1 (V1)—Day 0 (Baseline): 242.25 mg/dL;

Measurement 3 (V3)—Day 90 (Post-treatment): 189.00 mg/dL.

Cholesterol Reduction

Absolute mean reduction: 53.25 mg/dL.

Percentage mean reduction: approximately 22% compared with baseline values.

Clinical Interpretation

Baseline (Day 0): The mean baseline value of 242.25 mg/dL falls within the “high” cholesterol category and is associated with increased cardiovascular risk according to commonly used clinical benchmarks.

Post-treatment (Day 90): The post-treatment mean value of 189.00 mg/dL falls within the “desirable” range (<200 mg/dL), representing a clinically meaningful improvement.

Individual Responses

Most participants demonstrated a substantial reduction between V1 and V3. For example, patient 68F, who presented with the highest baseline value (279 mg/dL), showed a reduction to 197 mg/dL. Nearly all individuals reached or approached levels below 200 mg/dL.

These results suggest that the nutraceutical supplement IMOpro Cholequil® exerted a measurable lipid-lowering effect in this small cohort. Nevertheless, statistical tests such as the t-test generally require larger sample sizes to generate robust conclusions. Despite this limitation, the data indicate a relevant short-term effect, shifting the mean total cholesterol level from a high-risk value (242.25 mg/dL) to a desirable value (189.00 mg/dL) within 90 days.

The observed reduction of approximately 22% is comparable to results reported for structured dietary interventions or nutraceutical formulations containing monocolins and phytosterols, as described in the guidelines of the Italian Society of Diabetology (SID).

Moving below the critical threshold of 200 mg/dL for most participants suggests that the product may be useful for individuals with mild-to-moderate hypercholesterolemia.

4. Discussions

All eight subjects demonstrated a reduction in total cholesterol levels between Day 0 and Day 90. (**Figure 1**). High Average Reduction: The mean reduction in total cholesterol was approximately 22%, which is consistent with reductions typically observed with nutraceutical formulations containing red yeast rice and berberine, two key active components of IMOpro Cholequil®. However, the effect varied among individuals. Subject 55M showed the greatest reduction (−42.1%), whereas sub-

jects 38M and 59M exhibited smaller reductions (approximately –11% to –12%). An improvement was observed both between Day 0 and Day 30 and between Day 30 and Day 90, suggesting a progressive effect of the treatment over time.

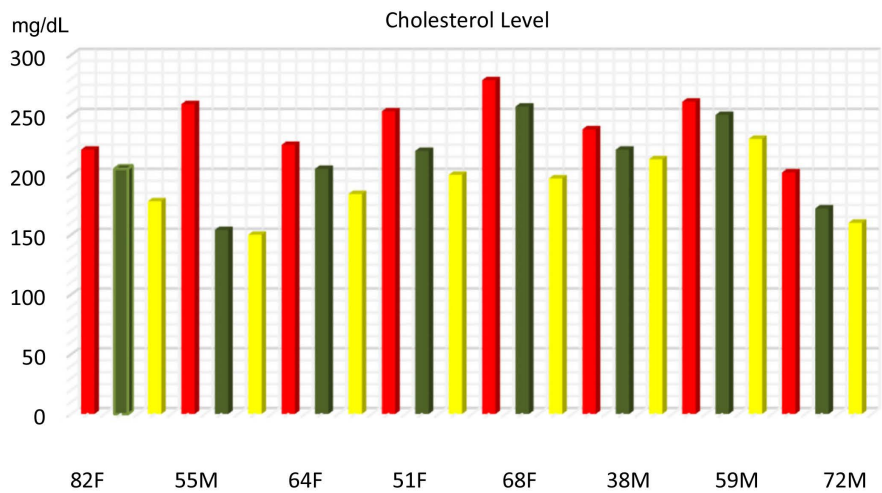


Figure 1. Cholesterol level: red T0, green T30, and yellow T90.

LDL Cholesterol Trends

The chart illustrating LDL cholesterol levels over the 90-day period demonstrates a consistent reduction across the patient cohort. LDL cholesterol is a critical biomarker for cardiovascular risk, with values below 100 mg/dL generally considered optimal for adults. Across all individuals, LDL levels progressively decreased from T0 to T60 and subsequently to T90, suggesting that the intervention was effective in reducing atherogenic cholesterol within three months (**Figure 2**).

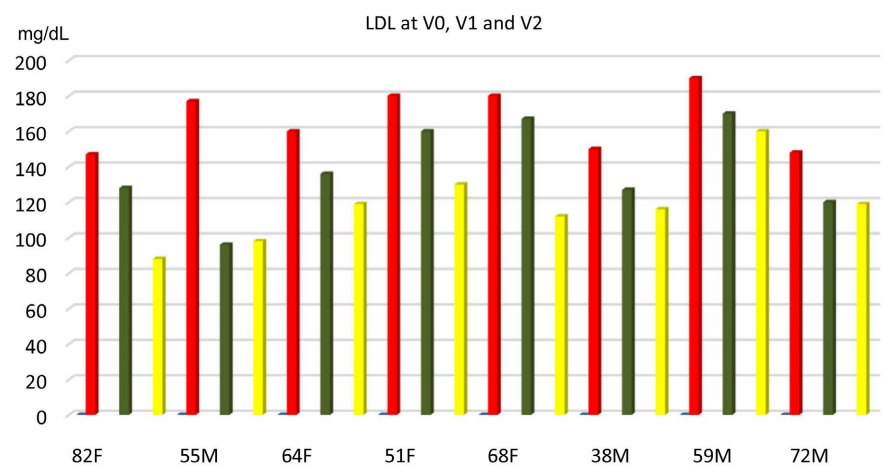


Figure 2. LDL level: red T0, green T30, and yellow T90.

Notably, significant improvements were already observable by Day 60, indicating an early metabolic response to the treatment. Active components such as monacolin K and berberine likely contribute to this rapid modulation of lipid metabolism.

By Day 90, several participants achieved clinically meaningful outcomes. For instance, patients 82F and 55M reduced their LDL levels below the 100 mg/dL threshold, transitioning from a borderline or high-risk category to an optimal range. Patient 68F, who initially presented with one of the highest LDL values (approximately 180 mg/dL), experienced a substantial reduction, reaching approximately 130 mg/dL.

Although the overall trend was positive, the magnitude of reduction varied across individuals. Patient 55M showed one of the most pronounced responses, nearly halving the baseline LDL value. Such “high responders” illustrate how nutraceutical interventions may, in certain individuals, approach the effectiveness of low-dose pharmacological therapy.

Importantly, LDL levels continued to decline between Day 60 and Day 90, suggesting that the effect does not immediately plateau but may continue to improve with sustained supplementation. From a clinical perspective, maintaining reduced LDL levels may significantly decrease the risk of atherosclerotic plaque formation and associated cardiovascular events.

HDL Cholesterol

HDL cholesterol responses were more variable among the eight patients. Some individuals, such as patients 38M and 51F, showed modest increases in HDL levels, whereas others, including patients 82F and 68F, exhibited slight decreases (Figure 3).

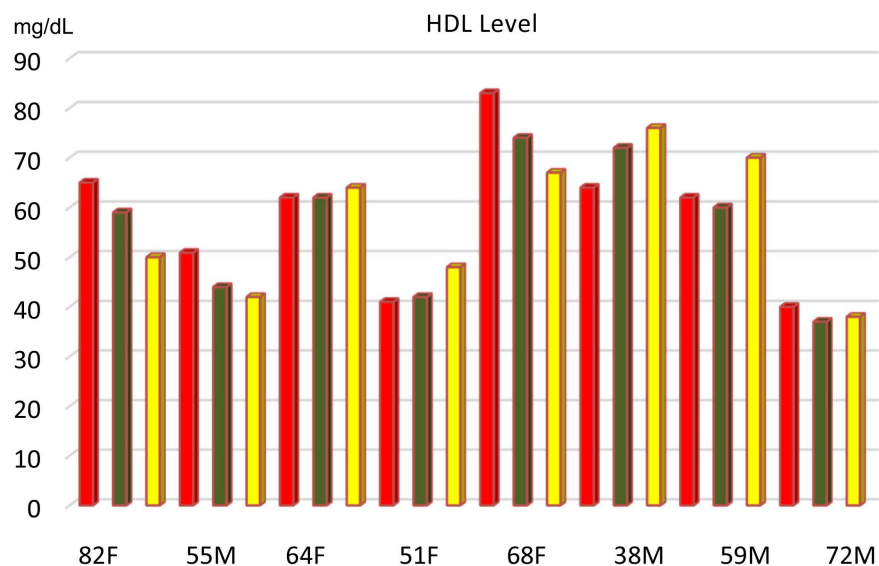


Figure 3. HDL level: red T0, green T30, and yellow T90.

Overall, HDL values remained relatively stable throughout the observation period. This finding can be considered clinically neutral, as the primary objective of lipid-lowering strategies is typically the reduction of LDL cholesterol rather than substantial modification of HDL levels.

Most participants maintained HDL concentrations within healthy ranges, gen-

erally above the clinically relevant threshold of 40 - 50 mg/dL. Variations may reflect individual differences, dietary patterns, or physical activity levels.

Triglycerides Levels

Triglyceride trends over the 90-day period showed a general reduction across most participants. At baseline, several individuals, including patients 51F and 72M, exhibited triglyceride levels above the optimal threshold of 150 mg/dL, a value associated with increased cardiovascular risk (Figure 4).

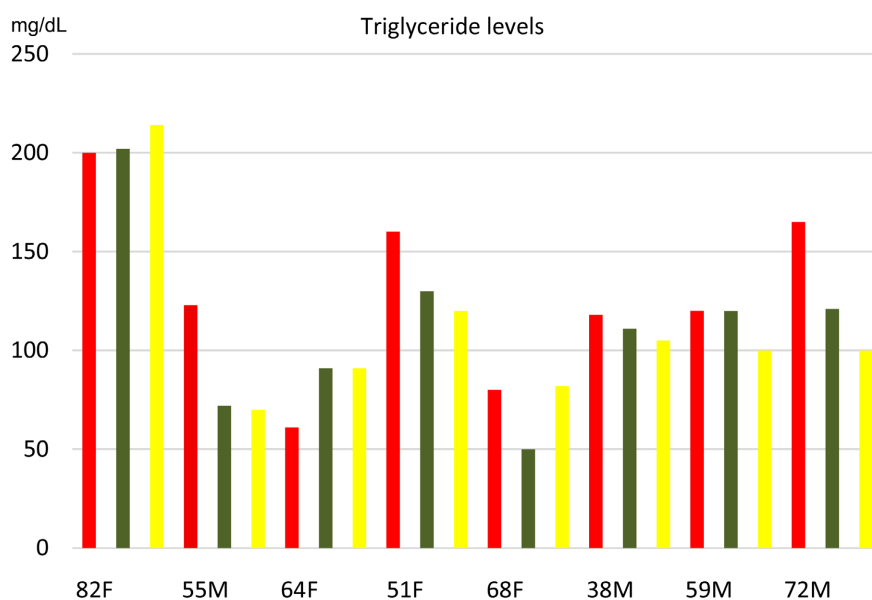


Figure 4. Triglyceride level: red T0, green T30, and yellow T90.

By Day 60, a clear downward trend was observed in the majority of patients, indicating an early response to the intervention. This improvement continued through Day 90. For example, patient 72M experienced one of the most pronounced reductions, reaching values close to 100 mg/dL.

Some variability remained within the dataset. Patient 82F showed a slight increase at Day 90, whereas patients 64F and 68F maintained relatively stable and low triglyceride levels throughout the study.

Overall, most participants shifted from “borderline high” values toward the normal range (<150 mg/dL).

5. Conclusion

The results obtained from this cohort of subjects suggest that the nutraceutical supplement IMOpro Cholequil® is capable of modulating lipid metabolism and reducing blood fat concentrations within a three-month period, considering treatment compliance and the reported absence of adverse reactions to the integrated treatment. Stabilizing triglycerides is a key clinical outcome for long-term metabolic health and arterial protection. Further randomized, controlled studies are needed to evaluate the promising effect of this nutraceutical supplement.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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