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**RESEARCH ARTICLE**

# HOW DO VITAMIN AND PLANT SEEDS WORK AS HYPOLIPIDEMIC AGENTS?

**Azmat Ali[1], Hina Aslam[2], Shah Murad[2], Khalid Niaz[2]**
*[1]Department of pharmacology, Alnafees Medical College, ISD, Pakistan.*
*[2]Department of pharmacology, IMDC, Pakistan.*

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***Address for Correspondence:**
**Dr. Shah Murad**, Head of Pharmacology Department, Islamabad Medical and Dental College, Main Murree road, Islamabad Pakistan. Mobile: +923142243415.
E-mail: *shahhmurad65@gmail.com*

## Abstract

**Objectives:** Cardiovascular diseases are leading cause of death in western and eastern countries of the world. Hyperlipidemia is one of the strong risk fractions for heart diseases. Purpose of current study was to estimate Kalonji and vitamin B-3 affects on LDL-cholesterol.
**Methods:** To evaluate hypolipidemic drugs efficacy, the study was conducted at National hospital, Lahore Pakistan from January 2016 to August 2016. Ninety hyperlipidemic patients were selected from cardiology and medical wards of the hospital. They were divided in three groups, one at placebo therapy, another on Kalonji and third one on Vitamin B3.
**Results:** After one and half month, significant changes (*p* value ranging from <0.05 to <0.001) were observed in their LDL and HDL-cholesterol. Conclusion of the study was to recommend use of herbal medicine and vitamin B3 for prevention of any heart diseases with good patient compliance.
**Conclusion:** Study concludes that Kalonji and vitamin B-3 affects LDL-cholesterol potently and these hypolipidemic agents increase HDL-cholesterol moderately.
**Keywords**：Cardiovascular diseases, Kalonji, Hyperlipidemia, vitamin.

## INTRODUCTION

Coronary artery disease (CAD) occurs when the inside (the lumen) of one or more coronary arteries narrows, limiting the flow of oxygen-rich blood to surrounding heart muscle tissue. Atherosclerosis is the process that causes the artery wall to get thick and stiff. It can lead to complete blockage of the artery, which can cause a heart attack[1]. The disease process begins when LDL deposits cholesterol in the artery wall. The body has an immune response to protect itself and sends white blood cells called macrophages to engulf the invading cholesterol in the artery wall. When the macrophages are full of cholesterol, they are called foam cells because of their appearance. If the process is not stopped, the fatty streak becomes a plaque, which pushes the intima into the lumen, narrowing the blood flow[2-6]. With few exceptions, low HDL is an independent risk factor for CAD in case-control and prospective observational studies[7]. In contrast, high HDL levels are associated with longevity and are protective against the development of atherosclerotic disease[8]. In the Framingham Study, risk for CAD increases sharply as HDL levels fall progressively below 40 mg/dl[9,10]. In the Quebec Cardiovascular Study, for every 10% reduction in HDL, risk for CAD increased 13% [2].

Many clinicians believe that low HDL is associated with increased CAD risk because it is a marker for hypertriglyceridemia and elevated remnant particle concentrations. The Prospective Cardiovascular Münster study, however, demonstrated that the increased risk associated with low HDL is independent of serum triglyceride levels[11]. There is considerable controversy about whether one HDL sub fraction is more antiatherogenic than others. At the present time, the preponderance of evidence favors increasing total HDL mass, rather than any one sub fraction of this lipoprotein [12].

## MATERIALS AND METHODS

The study was conducted at National hospital, Lahore Pakistan from January 2016 to August 2016. Ninety patients were selected for study. Consent was taken from all participants. Inclusion criteria was primary

and secondary hyperlipidemic patients. An exclusion criterion was patients suffering from any kidney, liver and thyroid related disease. Name, age, gender, occupation, residential address, phone/contact number, previous medical history, disease in family history, drug history were recorded in specific Performa. Three groups I, II, and III were made (30 patients in each group). Group-I was allocated for placebo, to take placebo capsule once daily, after breakfast for six weeks. Group -II was advised to take 2 tea spoons of kalonji after breakfast for the period of six weeks. Group-III was on Niacin 2 grams in divided doses, after breakfast, lunch and dinner for 6 weeks. Data were expressed as the mean±SD and 't' test was applied to determine statistical difference in results. A $p>0.05$ was considered as non-significance and $p<0.001$ was considered as highly significant change in the differences. Serum LDL-cholesterol was calculated by formula (LDL-Cholesterol=Total Cholesterol-(Triglycerides/5+HDL-Cholesterol). Serum HDL-cholesterol was determined by using kit Cat. #3022899 by Eli Tech Diagnostic, France.

## RESULTS

Numerical values and results of all parameters of participated patients were analyzed biostatistically. In placebo group, LDL-cholesterol decreased from 189.15 ±3.90 mg/dl to 186.75±2.08 mg/dl, change in the parameter is 2.40 mg/dl. This difference in pre-treatment and post treatment value is non-significant, ie; $p>0.05$. HDL-cholesterol in placebo group increased from 36.11±2.11 mg/dl to 37.17±1.51 mg/dl. The difference in parameter was 1.06 mg/dl. Statistically this change in parameter was non significant, i.e.; $p>0.05$. In *N. sativa* group, out of 30 hyperlipidemic patients, 27 patients completed over all study period. LDL-cholesterol in this group decreased from 202.45±1.54 mg/dl to 189.52±2.21 mg/dl. The difference in pretreatment and postreatment mean values is 12.93 mg/dl.

**Table 1: LDL, HDL's basic values (pre and after treatment) and their bio statistical significance.**

| No. of patients | Day-0 values | Day-45 values | Change in basic values | Statistical significance |
|---|---|---|---|---|
| Placebo (30 pts) | LDL-c=189.15±3.90 | LDL=186.75±2.08 | 2.40 | > 0.05 |
| | HDL-c=36.11±2.11 | HDL=37.17±1.51 | 1.06 | > 0.05 |
| Kalonji (27 pts) | LDL-c=202.45±1.54 | LDL=189.52±2.21 | 12.93 | < 0.001 |
| | HDL-c=38.81±3.90 | HDL=42.19±3.32 | 3.38 | < 0.01 |
| Vit B3 (28 pts) | LDL-c=212.65±2.32 | LDL=185.61±3.43 | 27.04 | < 0.001 |
| | HDL-c=39.19±2.01 | HDL=43.00±3.07 | 3.49 | < 0.01 |

HDL and LDL are measured in mg/dl, n stands for sample size, $p>0.05$ indicate non-significant, <0.01 indicate significant and <0.001 indicate highly significant change in basic value

Statistically this change in two mean values is highly significant, with $p<0.001$. HDL-cholesterol in this group increased from 38.81±3.90 42.19±3.32 mg/dl. Change in two mean values was 3.38 mg/dl. Statistically this change is significant, with $p<0.01$. In group III, 28 patients completed the research. LDL-cholesterol in this group decreased from 212.65±2.32 to 185.61±3.43 mg/dl in six weeks treatment. Change in pre and post treatment mean values is 27.04 mg/dl. Statistically this change is highly significant, i.e., $p<0.001$. HDL-cholesterol increased from 39.19±2.01 to 43.00±3.07 mg/dl in six weeks. Change in two parallel values is 3.49 mg/dl, which is significant with $p<0.01$.

## DISCUSSION

There are new guidelines recommended by WHO for treatment of hypertension, hyperglycemia, and hyperlipidemia. In current study results, treatment with three weeks, Kalonji decreased LDL-cholesterol 12.93 mg/dl by six weeks of treatment. HDL-cholesterol increased 3.38 mg/dl by taking this drug for six weeks. The change in both parameters were significant. In placebo group, LDL-C reduction was 2.40 mg/dl and increase in HDL-C was 1.06 mg/dl with $p>0.05$, which proves non-significant change in results. These results match with Akhondian *et al*.,[13] who did prove that *N. sativa* is very effective hypolipidemic drug. He tested the drug on 120 hyperlipidemic and diabetic patients by using *N. sativa* for one month. Their results were highly significant when compared with placebo-controlled group. Current results also match with results of Gillani AH *et al.*,[14] who proved LDL-Cholesterol reduction from 201.61±3.11 mg/dl to 187.16±2.10 mg/dl in fourty hyperlipidemic patients. Their HDL-C increase was 3.98 mg/dl which also matches with current results. Results of current study are in contrast with results of research work conducted by AH BH and Blunden G[15]. Their results showed only 2.11 mg/dl change in LDL-C and 0.92 mg/dl increase in HDL-C of 38 rats. Difference in results may be genetic variants of human and rats. Brown BG *et al.*,[16] also described phenomenon of genetic variation in pharmacological effects of *N. sativa*. Burits M and Bucar F [17] have also mentioned wide variety effects of *N. sativa* with different genetic make ups. Current results also match with results of research work of Dehkordi FR and Kamkhah AF[18] and El-Dakhakhany M[19]. Same mechanism of action of drug *N. sativa* is described by El-Din K *et al.*,[20]. In current research Niacin reduced LDL-Cholesterol from 212.65±1.19 mg/dl to 185.61±1.65 mg/dl in six weeks. This reduction in LDL-C was 27.04 mg/dl. These results match with results of research work conducted by Afilalo J *et al.*,[21] who proved almost same change in LDL-C in 32 hyperlipidemic patients who were cases of secondary hyperlipidemia and used Niacin 2 grams daily for two months. In current results HDL-C increase was 3.81 mg/dl in six weeks use of Niacin. Current results also match with results of research conducted by Whitney EJ *et al.*,[22] who proved 27.77

mg/dl reduction in LDL-C in 19 hyperlipidemic patients. Ginsberg HN *et al.*,[23] also support current results, as they proved 4.00 mg/dl increase in HDL-C when two grams of Niacin was used in 34 hyperlipidemic patients for six weeks. Current results do not match with results of research conducted by Boden WE *et al.*,[24] who proved that 2.5 grams Niacin decreased 10.99 mg/dl LDL-Cholesterol.

## CONCLUSION

It was concluded from the research study that Kalonji and vitamin B-3 affects LDL-cholesterol potently and these hypolipidemic agents increase HDL-cholesterol moderately. These hypolipidemic agents may be used as alternative medications with good patient compliance.

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## AUTHOR'S CONTRIBUTION

**Ali A:** writing, review, and editing. **Aslam H:** writing, review and editing. **Murad S:** formal analysis, writing, review, and editing. **Niaz K:** writing, review, and editing, investigation, conceptualization. Final version of manuscript is approved by all authors.

## DATA AVAILABILITY

The data and material are available from the corresponding author on reasonable request.

## CONFLICT OF INTEREST

No conflict of interest is associated with this work.

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