World Applied Sciences Journal 6 (8): 1053-1057, 2009
ISSN 1818-4952


# Effect of Prophetic Medicine *Kalonji* (*Nigella sativa* L.) On Lipid Profile of Human Beings: An *In Vivo* Approach

[1]*Inayat Ullah Bhatti*, [1]*Fazal Ur Rehman*,
[2]*Muhammad Aslam Khan and* [3]*Sarfaraz Khan Marwat*

[1]Faculty of Pharmacy, Gomal University D.I.Khan (NWFP), Pakistan
[2]Department of Arabic and Islamic Research Gomal University D.I.Khan (NWFP), Pakistan
[3]University Wensam College, Gomal University D.I.Khan (NWFP), Pakistan

**Abstract:** Seeds of *Nigella sativa* L. (Kalonji), also known as "seeds of blessing" were evaluated for their effects on lipid profile in human beings. The powder of seeds of *Nigella Sativa*, were orally administered to hypercholesterolemic patients (n=10) at the dose of 1 g before break fast for two months and was found to reduce total cholesterol (p=0.002), triglycerides (p=0.0001), HDL-cholesterol (p=0.0003) and LDL-cholesterol level (p=0.002) to a highly significant extent. This study demonstrates that the seeds of *Nigella Sativa* favourably modify the plasma lipid profile in hypercholesterolemic patients.

**Key words:** Nigella Sativa, Lipid profile, Hypercholesterolemia

## INTRODUCTION

Total lipid profile of an individual is a contributive principle resulting from blood cholesterol along with its associated varieties of lipoproteins i.e., high-density lipoproteins (HDL, or β-lipoproteins), low-density lipoproteins (LDL, or β-lipoproteins), very-low density lipoproteins (VLDL, or pre-β-lipoproteins) and Triglycerides. Disposition of blood pressure and coronary heart disease has been found to be in strong correlation with lipid profile particularly with blood cholesterol level [1]. Atherosclerotic cardiovascular and cerebrovascular diseases are the major cause of disability in western as well as in developing countries [2]. Coronary heart disease (CHD) has been a global problem since long. It prevails in high class society to low class society and affects all ages specially the middle age group. It is the cause of 25-30% of deaths in most industrialized countries [3]. The major cause of CHD is atherosclerosis with reference to major and minor etiological and pathogenetic factors associated with atherosclerosis, hyperlipidemic states especially hypercholesterolemia have been under consideration on a large scale [4].

Natural product medicines from plant sources of wide diversity have long been used effectively in the treatment of blood pressure and higher lipid level [5-12].

*Nigella Sativa* belongs to family Ranunculaceae. It is an annual, erect herb, 30-40 cm high. Leaves: lamina multifid, puberulous, Flowers solitary terminal, blue. It is distributed in S.W. Asia, S.Europe and N. Africa [13]. Seeds of *Nigella Sativa* are commonly known as kalonji which are triangular in shape, black in colour and possess a severe pungent smell. Its chemical composition is moisture 7.43, ash 4.14, fixed oil 37, volatile oil 1.64, albumin 8.2, mucilage1.9%, organic acid precipitated by copper 0.38,metarabin 1.36, melanthin 1.4, cellulose 8.32, sugar 2.75, Arabic acid 3.41 and other substances dissolved by soda 9.38% [14].

*Nigella Sativa* seeds are the common drug used in Tibbe-Nabvi (Prophet's Medicine) through out the world. Since, Prophet Muhammad (PBUH) mentioned its therapeutic efficacy and potential of cure. It is stated in books of Seerat that Prophet Muhammad (PBUH), himself used to take these seeds with the syrup of Honey for therapeutic purpose. The Holy Prophet Muhammad (PBUH) said, "The black seed (Kalonji) is the remedy for every disease except death."[15]. Hazrat Abu Hurairah (Radi Allaho Anho) narrates, "I have heard from

**Corresponding Author:** Dr. Sarfaraz Khan Marwat, University Wensam College,
Gomal University D.I. Khan (NWFP), Pakistan

Rasulullah (PBUH) that there is cure for every disease in black seeds except death and black seeds are shooneez (kalonji)"[15]. The same narration is found in Musnad-e-Ahmed from Hazrat Aisha (Radi Allaho Anha), in Ibn-Al-Jozi and Tirmizi from Abu Hurairah (Radi Allaho Anho) and Hazrat Buraida (Radi Allaho Anho) respectively.

*Nigella sativa* seeds are also used in Ayurvedic system of medicine all over the world. It was used as powder and ethanolic extracts in children under 12 years of age for antinematodal and anticestodal effects and observed significant antinematodal and anticestodal effects [16].Its ethanolic extract was used in malignant ulcers of cheek in hospitalized patients and it healed ulcers. The extract was also used to observe cytotoxic effect in albino mice and was found as effective cytotoxic agent [17]. Its different fractions (extracts) were used in Rabbits to observe its effects in whole blood clotting and plasma clot time. In vitro it significantly shortened both and bleeding time, partial thromboplastin time, prothrombin time and thrombin time. In vivo it shortened bleeding time and partial thromboplastin time but prothrombin time and thrombin time remained unaffected [18]. Its active principles thymoquinone and polythymoquinone were used in rats, dogs and guinea pigs to observe its uricosuric, antihistamine and choleratic activity and it was concluded that it is good uricosuric, strong antihistamine and increased bile excretion [19].

In this research, the effect of seeds of *Nigella sativa* on serum cholesterol, HDL-and LDL-cholesterol and triglycerides have been studied in human models to look for their possible cholesterol lowering activity in the light of sayings of Holy Prophet Muhammad (PBUH) that "The black seed (Kalonji) is the remedy for every disease except death."

## MATERIAL AND METHODS

**Tested Material:** Seeds of *Nigella sativa* (Kalonji) were purchased from the local market at D.I.Khan and identified by the Department of Pharmacognosy, Faculty of Pharmacy Gomal University D.I.Khan, N.W.F.P., Pakistan.

**Chemicals:** All chemicals used in this study were of analytical grade. They were products of Merck, Darmstadt, Germany. Reagents used for all the assays were commercial kits and products of Randox, USA.

**Study Subjects and Protocol:** In a clinical trial planned to evaluate the hypercholesterolemic activity of *Nigella sativa* (Kalonji) in hypercholesterolemic patients. Ten male with hypercholesterolemia (n=10) were chosen within the age limit of 50-55. The physical and pathological histories of these subjects were recorded. All subjects maintained their regular lifestyles, especially their physical activity. Powder of seeds of *Nigella sativa* (Kalonji) was orally administered at a dose of 1g before break fast to each of the subjects (n=10) for 2 months.

Venous blood was collected from the subjects before and after treatment and Serum total cholesterol was determined by standard procedures [20, 21]. and triglycerides was determined by enzymatic method [22] using a commercially available reagent kit (Randox laboratories Ltd., United Kingdom).In order to determine the HDL-cholesterol and LDL-cholesterol standard procedure using cholesterol kit was used [23, 24].

**Statistical Analysis:** Statistical analysis was performed using SPSS windows version 11.5. All values are expressed as mean±SEM. For all generated data statistical differences were assessed by two-tailed, paired Student's *t* test to assess the effect of drug. P values of = 0.05 were considered significant.

## RESULT

This study was attempted to identify the effect of *seeds* of *Nigella Sativa* (Kalonji) on total cholesterol, HDL-cholesterol, LDL-cholesterol and triglycerides. These parameters were measured before and after the treatment. The serum cholesterol, triglycerides and HDL were determined with in 24 hours in fasting state.

Total blood cholesterol level was significantly reduced from 261.8 mg/dl to 216.3mg/dl after administration of *Nigella Sativa* (Kalonji) powder with a P=0.002. Table-1 presents the data of total cholesterol. Again, *Nigella Sativa* (Kalonji) significantly lowered the LDL-cholesterol from 238.8mg/dl to 188.0mg/dl (Table-2) with a P-value of 0.002. Kalonji was found to increase the serum HDL cholesterol from 43.2 to 54.4mg/dl with a p-value of 0.0003. The data serum HDL cholesterol is presented in Table-3. It was also observed that, after oral administration of *Nigella Sativa* (Kalonji) powder, there was a significant decrease in triglyceride level in blood from 275.9mg/dl to 235.5mg/dl with a p-value of 0.0001 (Table-4). The overall result has been shown in Table-5 and Fig-1.

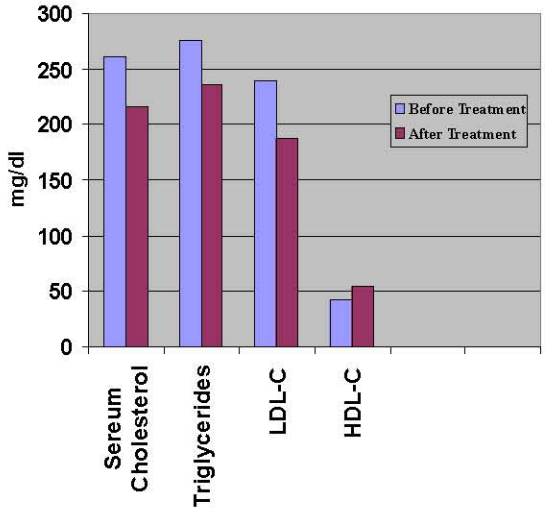


Fig. 1: Graphical representation of overall results

Table 1: Showing the data of total cholesterol.

| | Serum Cholesterol (mg/dl) | |
|---|---|---|
| No. of Observations | Before Treatment | After Treatment |
| 1 | 291 | 266 |
| 2 | 285 | 235 |
| 3 | 280 | 255 |
| 4 | 275 | 236 |
| 5 | 273 | 250 |
| 6 | 270 | 247 |
| 7 | 260 | 245 |
| 8 | 241 | 200 |
| 9 | 230 | 119 |
| 10 | 213 | 110 |
| Mean | 261.8 | 216.3 |

Table 2: Showing the data of LDL-Cholesterol

| | LDL-Cholesterol(mg/dl) | |
|---|---|---|
| No. of Observations | Before Treatment | After Treatment |
| 1 | 266 | 240 |
| 2 | 260 | 245 |
| 3 | 260 | 240 |
| 4 | 245 | 160 |
| 5 | 265 | 230 |
| 6 | 250 | 160 |
| 7 | 250 | 160 |
| 8 | 255 | 150 |
| 9 | 173 | 160 |
| 10 | 164 | 135 |
| Mean | 238.8 | 188.00 |

## DISCUSSION

Hypercholesterolemia is a major risk factor for coronary artery disease; a reducing plasma cholesterol level, particularly LDL cholesterol, reduces the risk of this disease.

*Nigella Sativa* seeds are the common drug used in Ayurvedic system of medicine and Tibbe-Nabvi (Prophet's Medicine) through out the world. The data generated in this study indicates that, *Nigella Sativa* (Kalonji) seeds have a diversified effect on total lipid profile. It was found to impart a significant impact in lowering total cholesterol level and LDL-cholesterol level, which is also known as 'bad cholesterol' in body.

Table 3: Showing the data of HDL-Cholesterol

| | HDL-Cholesterol (mg/dl) | |
|---|---|---|
| No. of Observations | Before Treatment | After Treatment |
| 1 | 45 | 65 |
| 2 | 45 | 65 |
| 3 | 47 | 60 |
| 4 | 45 | 64 |
| 5 | 40 | 45 |
| 6 | 40 | 45 |
| 7 | 44 | 50 |
| 8 | 40 | 45 |
| 9 | 42 | 50 |
| 10 | 44 | 55 |
| Mean | 43.2 | 54.4 |

Table: 4 Showing the data of Triglycerides

| | Triglycerides (mg/dl) | |
|---|---|---|
| No. of Observations | Before Treatment | After Treatment |
| 1 | 328 | 260 |
| 2 | 275 | 250 |
| 3 | 270 | 245 |
| 4 | 275 | 250 |
| 5 | 265 | 200 |
| 6 | 260 | 200 |
| 7 | 260 | 200 |
| 8 | 260 | 250 |
| 9 | 273 | 250 |
| 10 | 293 | 250 |
| Mean | 275.9 | 235.5 |

Table 5: Tabulated Results

| | Before Treatment(n=10) | After Treatment(n=10) | | |
|---|---|---|---|---|
| Name of parameter | Mean±SEM | Mean±SEM | P-value | Results |
| Cholesterol(mg/dl) | 261.8±8.1087 | 216.3±17.8388 | 0.002 | Highly Significant |
| Triglycerides(mg/dl) | 275.9±6.6071 | 235.5±7.8333 | 0.0001 | Highly Significant |
| LDL-Cholesterol(mg/dl) | 238.8±11.9264 | 188.0±14.0672 | 0.002 | Highly Significant |
| HDL-Cholesterol(mg/dl) | 43.2±0.8 | 54.4±2.6923 | 0.0003 | Highly Significant |

LDL-cholesterol is taken up by the cells via LDL-receptors. LDL-receptor is a transmembrane glycoprotein that recognizes apoB-100, the exclusive apoprotein of LDLs and takes up LDL molecules through receptor mediated endocytosis. The endocytosed membrane vesicles fuse with lysosomes and, in which the apoproteins are degraded and the cholesterol esters are hydrolyzed to yield free cholesterol. The cholesterol is then incorporated into plasma membrane as necessary.

Since *Nigella sativa* (Kalonji) reduced the total cholesterol level, there is probably a decrease in intracellular cholesterol and it is known that a decrease in intracellular cholesterol level causes an upregulation of LDL-receptor. These results suggest that Nigella sativa (Kalonji) has a protective role in atherosclerosis and that is due to its hypolipidemic activity. This has been obtained previously in other studies like in a study conducted in Canada to see the effect of Petroleum ether extract of Nigella Sativa (Kalonji) exert lipid lowering and insulin sensitizing action in the rats. At the end of four weeks of treatment *Nigella Sativa* (Kalonji) treated rats had lowered Triglycerides and higher HDL cholesterol [25]. In other study conducted at Egypt to see the influence of Thymoquinone (Active ingredient of *Nigella Sativa* (Kalonji) seeds) on Doxorubicin-induced hyperlipidemic nephropathy in rats, results showed rats treated with Thymoquinone (10mg/kg/day) for five days significantly lowered serum urea, Triglycerides and total cholesterol [26]. In an other study conducted at Egypt, the *Nigella Sativa* (Kalonji) oil was administered (800mg/kg) for four weeks and showed significant decrease in serum total cholesterol, low density lipoprotein cholesterol, triglycerides and significant elevation of serum high density lipoprotein level [27]. Several other studies conducted at different places on the rats showed the same pattern of results.

The experiment, though confirms the potentiality of *Nigella sativa* (Kalonji) seeds on lowering cholesterol and LDL-cholesterol level, however further investigation is required on larger population to quantify and qualify this issue.

## CONCLUSION

On the basis of these findings it is concluded that *Nigella Sativa* produces antiatherogenic effect by decreasing low density lipoprotein cholesterol level significantly. It also increases high density lipoprotein cholesterol level. Thus *Nigella Sativa* prevents atherogenesis by decreasing LDL-c and is in accordance with Tibbe-Nabvi (prophetic medicine) to reflect on the insight of the comments of Hazrat Mohammad (PBUH), "The black seed is a remedy for everything but death."

## REFERENCES


1. Cotran, K.C., 1999. Cellular Pathology. Robbins Pathologic basis of disease, Fifth Edition, Elsvier, UK, pp: 40.
2. Aqil, S., A. Jaleel, F. Jaleel and F. Basir, 2008. Comparison of adiponectin in ischemic heart disease versus ischemic stroke in diabetic patients. World Applied Sci. J., 3(5): 759-762.
3. Park, K., 2004. Parks text book of preventive and social medicine. 24th ed. Jabalpur India: Banarasi Das Bhanot, pp: 272-73.
4. Ahmed, M.M., K. Jeyalingam, A.M. Hassan and T. Marinah, 1992. Dietary fats and hypercholestrolemia in an experimental model of Macaca Fascilaris. Pak. Pathol., 3: 5-10.
5. Anderson, J.W., B.M. Johnstone and M.E. Cook-Newell, 1995. Meta-analysis of the effects of soy protein on serum lipids. N. Engl. J. Med., 332: 276.
6. Koscielny, J., D. Klussendorf and R. Latza, 1999. The antiatherosclerotic effect of Allium sativum. *Atherosclerosis*, 144: 237.
7. Anderson, J.W., M.H. Davidson and L. Blonde, 2000. Long term cholesterol-lowering effects as an adjunct to diet therapy in the treatment of hypercholesterolemia. Am. J. Clin. Nutr., 71: 1433.
8. Castano, G., R. Mas, J.C. Fernandez, J. Illnait, L. Fernandez and E. Alvarez, 2001. Effect of policasanol in older patients with type II hepercholesterolemia and high coronary risk. J. Gerontol. A. Biol. Sci. Med. Sci., 56: 186.
9. Debourdeau, P.M., S. Djezzar and J.L. Estival, 2001. Lifethreatening cosinophlic pleuropericardial effusion related to vitamin B5 and h. Ann. Pharmacother., 35:424.
10. Quiles, J.L., M.D. Mesa, C.L. Ramirez-Tortosa, C.M. Aguilera, M. Battino, A. Gil and M.C. Ramirez-Tortosa, 2002. Curcuma longa extract supplemenatation reduces oxidative stress and attenuates aortic fatty streak development in rabbits. Arterioscler Thromb. Vasc Biol., 22: 1225.
11. Ros, E., I. Nunez, A. Perez-Heras, M. Serra, R. Gilabert, E. Casals and R.A. Deulofeu, 2004. Walnut Diet Improves Endothelial Function in Hypercholesterolemic Subjects:A Randomized Crossover Trail. Circulation, 109: 1609.

12. Delaney, B., R.J. Nicolosi, T.A. Wilson, T. Carlson, S. Frazer, G.H. Zheng, R. Hess, K. Ostergren, J. Haworth and N. Knutson, 2003. Beta-glucan fractions from barley and oats are similarly antiatherogenic effect of Allim sativum. J. Nutr., 133: 468.
13. Qureshi, R.A. and M.N. Chaudhri, 1988. The Ranunculaceae of Pakistan. Pak. System. Bulletin of the Herbarium, Quid-i-Azam University, Islamabad, pp: 31-32.
14. Saeed, H.M., 1972. Pharmacography Indica Hamdard, 15:28-29.
15. Ghaznavi, K.M., 1991. Tibb-e-Nabvi aur Jadid Science, Al-Faisal Nasheeran Wa Tajeeran-e-Kutab. Urdu Bazar Lahore, Pakistan. 1: 228-236.
16. Akhtar, M.S. and S. Riffat, 1991. Field Trail of saussurea lappa roots against nematodes and Nigella sativa seed against cestides in children. J. Pak. Med. Assoc., 41: 185-7.
17. Panikar, K.R., M.J. Salomi, M. Kesven, S.R. Dorata and K. Rajgopalam, 1989. Anticancer activity of *Nigella sativa*. Ancient Science of life, 8: 262-78.
18. Ghoneim, M.T., El-Ginly, R. El-Aami, R.E. Shouky and S. Yaseen, 1982. Possible effects of some extracts of *Negilla sativa* seed on blood coagulation system and Fibrinolytic activity. Proceeding of 2nd International Conference on Islamic medicine, Kuwait, pp: 528-35.
19. El-Dakhakhany, M., 1982. Some pharmacological properties of some constituents of Nigella sativa seed. Planta Med., pp: 426-8.
20. Richmond, W., 1973. Preparation and properties of a cholesterol oxidase from Nocradia sp. and its application to the enzymatic assay to total cholesterol in serum. Clin.Chem., 18: 1350.
21. Roeschlau, P., E. Bernt and W. Gruber, 1974. Enzymatic determination of total cholesterol in serum. J. Clin.Chem. Clin. Biochem., 12: 227.
22. Nagele, U., E.O. Hagele, G. Sauer, E. Wiedemann, P. Lehmann, A.W. Aahlefeld and W.J. Gruber, 1984. Reagent for the enzymatic determination of serum total triglycerides with improved lipolytic efficiency. J. Clin. Chem. Clin. Biochem., 22: 165-174.
23. Wieland, H. and D.A. Seidel, 1999. A simple specific method for precipitation of low density lipoproteins. J. Lipid Res., 24: 904.
24. Lopes-Virella, M.F., P. Stone, S. Ellis and J.A. Colwell, 1977. Cholesterol Determination in high-density lipoproteins separated by three different methods. Clin. Chem., 23: 882-884.
25. Le, P.M., A. Benhaddou-Andaloussi, A. Settaf, Y. Cherrah, P.S. Haddad, 2004. The petroleum ether extract of Nigella sativa exerts lipid powering actom in the rats. J Ethanopharmacol, 94(2-3): 251-9.
26. Badary, O.A., A.B. Abdel Nain, M.H. Abdel Wahab and F.M. Hamada, 2000. Induced hyperlipidermic nephropathy in rats: Toxicol., 143(3): 219-26.
27. El Dakha Khani, M., N.L. Mady and M.A. Halim, 2000. *Nigella sativa* L. oil protects Against induced hepatotoxicity and improves serum lipid profile in rats. Arzneimittelforschung, 50(9): 832-6.