

ORIGINAL ARTICLE

Anti-Hypertensive Effect of Nigella Sativa Seeds in patients with Hypertension

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ABSTRACT

Background: Hypertension (HTN) is an important public health problem. Antihypertensive drugs lead to side effects, possibly leading to non-compliance, thus uncontrolled hypertension as well as cardiovascular morbidity enhanced risk and death.

Aim: To determine the effect of nigella sativa seeds in patients with hypertension at 0, 6 and 12 weeks; and to compare these effects with control patients on standard hypertension therapy.

Study Design: Experimental study.

Methodology: Present study enrolled 200 patients with hypertension (100 cases and 100 controls) visiting Services Hospital Lahore. Nigella sativa seeds were administered to 100 hypertensive patients who were on standard therapy in a dose of 1.5gms (once daily) orally for 12 weeks. Their blood pressure was recorded and compared to the 100 patients in control group taking standard therapy only at 0, 6, 12 weeks. Data was collected through questionnaire which was entered in computer using SPSS

Results: Among cases, mean age was 45.16±10.544 years while in controls was 41.61±10.971 years. In case group, at 0 week, 6 weeks and 12 weeks, the mean systolic blood pressure (mmHg) was 139.49±6.337, 137.87±5.829 and 132.66±5.887 while mean diastolic blood pressure was 102.32±6.135, 100.58±6.081 and 95.26±6.594, respectively. In control group at 0 week, 6 weeks and 12 weeks, the mean systolic blood pressure (mmHg) was 139.07±6.307, 138.93±6.961 and 133.37±5.836 while mean diastolic blood pressure was 102.85±5.844, 102.75±5.518 and 95.64±6.850, respectively. **Conclusion:** We concluded that Nigella Sativa seeds have anti-hypertensive effect and significantly reduce the blood pressure among patients with hypertension.

Keywords: Nigella Sativa, Seed, Effect, Patients and Hypertension

INTRODUCTION

Hypertension is an important public health problem.¹ It is described as an ongoing increase in systolic blood pressure (SBP) of ≥140mmHg and diastolic blood pressure (DBP) of ≥90mmHg^{2,3}. Also, the hypertension is documented like a global chronic, nontransferable disease and as “silent killer” because of its elevated death rates as well as lack of hypertension early symptoms. Among adult populace of the world, one-quarter has hypertension and it is anticipated that during 2025, this figure will probably enhance to 29%. As per estimation of Pakistan National Health Survey, virtually 18.9% people in Pakistan aged ≥15 were hypertensive. In both developing and industrialized country, hypertension elevated prevalence makes it an important cause for death and morbidity. Regrettably, the hypertension incidence is rapidly increasing among developing states which are experiencing epidemiological changes, urbanization, economic progress and increased life expectancy⁴.

Hypertension is believed a leading risk determinant regarding renal, cerebrovascular and cardiovascular diseases⁵. Hypertension has ability to strain heart, enhance heart attack risk, damage the blood vessels, renal problem, stroke and eventually death⁶. At present, hypertension available treatments comprise several antihypertensive drugs classes namely angiotensin II receptor blockers, angiotensin-converting enzyme inhibitors, thiazide-type diuretics and calcium channel blockers. Antihypertensive drugs lead to side effects, possibly leading to non-compliance, thus uncontrolled hypertension as well as cardiovascular morbidity enhanced risk and death. Hence, there has been growing interest in pharmacological alternative treatments regarding hypertension⁷.

During ancient time plants were used by human as medications⁸. Herbal plants, in modern world, are still getting significant attention as shown by yearly growth of industry that use herbal plants in industrialized countries which is rising at 7-15% rate per annum⁹.

Nigella sativa Linn is from Ranunculaceae family. It is recognized as “Kalonji” in the south Asian countries while in Arabic it is called “Habatul Sauda”. Among western countries it is recognized with the name of Black cumin¹⁰. The NS is a plant which is cultivated globally, mostly in Pakistan, Middle East, India, South Europe, Mediterranean regions, Turkey, Saudi Arabia and Syria¹¹. It is one of the flowering plants which has 20 to 30CM height with dietary composition comprising of protein 16-19.9%, oil 31-35.5%, fiber 4.5- 6.5%, carbohydrates 33-34% moisture 5-7%, saponins 0.013 and ash 3.7 to 7%¹².

Nigella sativa is an important and most revered therapeutic seed in the history¹³. Its oil and seeds both have extensively been utilized to manage various diseases and considered a significant medicine in conventional medical system in the Middle East and Asian countries (Arabic, Unani, Chinese and Ayurveda medicines) and recommended for frequent usage in the Tibb-e-Nabwi as well^{9,14}. The seeds of Nigella Sativa have been utilized like a natural medicine for various illnesses¹⁵, such as diabetes, inflammation, gastrointestinal problems, hypercholesterolemia, tumour, and hypertension¹⁶.

The objective of the study was to determine the effect of nigella sativa seeds in patients with hypertension at 0, 6 and 12 weeks and to compare these effects with control patients on standard hypertension therapy.

METHODOLOGY

It was an experimental study in which 200 patients (100 cases and 100 controls) visiting Services Hospital Lahore were included after permission from IRB. Convenient purposive sampling technique was used. The duration of study was 12 weeks. Study included both male and female patients aged 18 to 60 years with hypertension (above 140 systolic/diastolic above 90mmHg). Patients with hypo lipidemic therapy, with any other co-morbidity or taking any other alternative medication were excluded from study.

Nigella sativa seeds were obtained from local herb market and administered to 100 hypertensive patients (cases) who were on standard therapy plus a dose of 1.5gms (once daily) orally for 12 weeks. The patients were advised not to alter their food habits

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during the period of study. Their blood pressure was recorded and compared to the 100 patients in control group (controls) taking standard therapy only at 0, 6, 12 weeks. It is important to mention that previous studies have been done on 500mg Nigella Sativa extract but in our study 1.5gm Nigella Sativa seeds were utilized which are equal to 500mg extract. Blood pressure was measured with mercury sphygmomanometer on week zero as baseline, week 6 and week 12 at the end of the study. Blood pressure 3 readings were taken on each occasion with 5 minutes difference. Average of these readings was taken as the final reading for analysis. Informed written consent was taken from respondents. Confidentiality of data was ensured.

Data was collected through questionnaire which was entered into computer using SPSS 25. Quantitative data was presented as mean \pm SD with necessary graphic representation. In case of normal distribution t-test was applied to determine difference between the two groups. P-value of ≤ 0.05 was taken as significant.

RESULTS

Among 100 patients in case group, 13(13%) were upto 30 years old and 17(17%) were 31-40 years old while 70(70%) were 41-60

years old. The mean age of the patient was 45.16 ± 10.544 years. Other demographic data was concluded in table-1.

Among 100 patients in case group, 31(31%) were literate and 69(69%) were illiterate. Likewise, among 100 patients in control group, 38(38%) were literate and 62(62%) were illiterate. Among 100 patients in case group, 87(87%) were employed and 13(13%) were unemployed. Among 100 patients in control group, 81(81%) were employed and 19(19%) were unemployed. Other socio-economic parameters were given in table-2.

Table-3 indicated that in case group, 42(42%) patients had weight <60 kg and 58(58%) had ≥ 60 kg while 82(82%) patients height was <5.6 feet and 18(18%) patients height was ≥ 5.6 feet.

Table-4 confirmed that in both groups all (100%) patients were taking allopathic medication. The regularity in taking medication in case group was 95% while in control group was 90%.

Table-5 showed that in case group at 0 week, 6 weeks and 12 weeks, the mean systolic blood pressure (mmHg) was 139.49 ± 6.337 , 137.87 ± 5.829 and 132.66 ± 5.887 while mean diastolic blood pressure was 102.32 ± 6.135 , 100.58 ± 6.081 and 95.26 ± 6.594 , respectively.

Table-1: Demographic data of patients

	Case Group		Control Group		P-value
	N	%	N	%	
Age (years)					
≤ 30	13	13.0	17	17.0	0.021
31-40	17	17.0	31	31.0	
41-60	70	70.0	52	52.0	
Total	100	100.0	100	100.0	
Mean \pm SD	45.16 ± 10.544		41.61 ± 10.971		
Gender					
Male	67	67.0	61	61.0	0.379
Female	33	33.0	39	39.0	
Total	100	100.0	100	100.0	

Table 2: Socio-economic Data of Patients

	Case Group		Control Group		P-value
	N	%	N	%	
Education					
Literate	31	31.0	38	38.0	0.300
Illiterate	69	69.0	62	62.0	
Total	100	100.0	100	100.0	
Occupation					
Employed	87	87.0	81	81.0	0.249
Unemployed	13	13.0	19	19.0	
Total	100	100.0	100	100.0	
Income					
$<25,000$	45	45.0	50	50.0	0.629
$\geq 25,000$	55	55.0	50	50.0	
Total	100	100.0	100	100.0	
Mean \pm SD	29000.4 ± 99.08		28000.7 ± 10.26		
Spouse's education					
Literate	19	19.0	25	25.0	0.308
Illiterate	81	81.0	75	75.0	
Total	100	100.0	100	100.0	
Spouse's occupation					
Employed	11	11.0	14	14.0	0.524
Unemployed	89	89.0	86	86.0	
Total	100	100.0	100	100.0	

Table-3: Weight and Height of Patients

	Case Group		Control Group		P-value
	N	%	N	%	
Weight (kg)					0.475
<60	42	42.0	37	37.0	
>60	58	58.0	63	63.0	
Total	100	100.0	100	100.0	
Mean±SD	61.85±6.661		62.51±6.375		
Height (ft)					0.675
<5.6	82	82.0	83	83.0	
≥5.6	18	18.0	17	17.0	
Total	100	100.0	100	100.0	
	5.436±0.2653		5.420±0.2734		

Table 4: History of medication among patients

	Case Group		Control Group		P-value
	N	%	N	%	
Type of medication					
Allopathic	100	100.0	100	100.0	--
Others	0	0.0	0	0.0	
Total	100	100.0	100	100.0	
Regularity in taking medication					
Yes	95	95.0	90	90.0	0.181
No	5	5.0	10	10.0	
Total	100	100.0	100	100.0	

Table-5: Anti-hypertensive effect of nigella sativa seeds when compared with standard hypertension therapy

	0 week				6 weeks				12 weeks			
	Systolic (mmHg)		Diastolic(mmHg)		Systolic (mmHg)		Diastolic(mmHg)		Systolic (mmHg)		Diastolic(mmHg)	
	130-140	>140	90-100	>100	130-140	>140	90-100	>100	125-135	>135	85-95	>95
Case group												
N (%)	66 (%)	34 (%)	35 (%)	65 (%)	76 (%)	24 (%)	47 (%)	53 (%)	79 (%)	21 (%)	51 (%)	49 (%)
Mean±SD	139.49±6.337		102.32±6.135		137.87±5.829		100.58±6.081		132.66±5.887		95.26±6.594	
Control group												
N (%)	71 (%)	29 (%)	27 (%)	73 (%)	70 (%)	30 (%)	27 (%)	73 (%)	71 (%)	29 (%)	48 (%)	52 (%)
Mean±SD	139.07±6.307		102.85±5.844		138.93±6.961		102.75±5.518		133.37±5.836		95.64±6.850	
P-value	0.639		0.532		0.244		0.009*		0.393		0.690	

*Statistically significant

DISCUSSION

Hypertension is believed a leading health issue worldwide and a significant risk factor regarding cardiovascular, renal and cerebrovascular diseases. For hypertension management, the medicinal plants usage has been increased for several decades. Nigella sativa seeds have been utilized like a natural medicine for various illnesses such as diabetes, inflammation, gastrointestinal problems and has also been shown to have antihypertensive properties among humans. Present study was carried out at Services Hospital Lahore to determine the antihypertensive effect of Nigella Sativa seeds in patients with hypertension. To acquire appropriate outcomes, 200 patients (100 cases and 100 controls) were included in the study and found that majority of the patients in both groups (67% cases and 61% controls) were males and rest of them were female patients. But a study performed by Rizka and coworkers (2017) reported that among patients, only 34% in case and 21% in control groups were male and remaining significant proportion of patients in both groups were male.¹⁷ In our study mean age of the patients in case group was 45.16±10.544 years while in control groups was 41.61±10.971 years. The findings of our study are comparable but exhibited better scenario than the study carried out by Badar and associates (2017) who asserted that mean age of patients in cases was 46.82±8.63 years while in controls was 46.12±6.41 years¹⁸.

Education, occupation and income are the leading factors that play considerable roles in treatment seeking behavior of patients regarding their diseases. Study showed very discouraging results that most of the patients in case and control groups were illiterate but employed with monthly income above 25000 rupees. However, majority of their spouses were also illiterate and unemployed. In both groups, all patients were taking allopathic medicine but regularity in taking medicine was 95.0% and 90.0% in case and control groups, respectively.

When the effect of nigella sativa seeds was assessed among patients with hypertension, study highlighted that patient who were using nigella sativa seeds had better outcome than their controls. Study revealed that in case group, mean SBP and DBP at baseline were 139.49±6.337 and 102.32±6.135 which decreased to 132.66±5.887 and 95.26±6.594 after treatment, respectively. In control group, mean SBP and DBP at baseline were 139.07±6.307 and 102.85±5.844 which reduced to 133.37±5.836 and 95.64±6.850 after treatment, respectively, indicating the anti-hypertensive effect of nigella sativa seeds among patients. A study undertaken by Rizka and coworkers (2017) also confirmed the anti-hypertensive effect of nigella sativa and found that among cases, mean SBP and DBP at baseline were 160.4±15.7 and

78.3±11.9 which reduced to 145.8±19.8 and 74.4±8.2 after treatment, respectively. Among controls, mean SBP and DBP at baseline were 160.9±16.3 and 79.0±12.4 which reduced to 147.53±22.0 and 78.2±8.9 after treatment, respectively.¹⁷ A study conducted by Dehkordi and Kamkhah (2008) reported that nigella sativa intake for two months reduced the both SBP and DBP among hypertensive patients when compared with baseline and control group values⁵. Huseini and colleagues (2013) also asserted in their study usage of NS for eight weeks significantly reduced the SBP and DBP among patients when compared with control groups and baseline values¹⁹. A study done by Shah and teammates (2012) also showed the usefulness of nigella sativa and reported that in case group, mean SBP and DBP at baseline were 157.8959±22.9762 and 89.0364±12.5166 which decreased to 131.9648±9.6993 and 84.959±10.8278 after treatment, respectively. In control group, mean SBP and DBP at baseline were 153.9667±20.7025 and 89.7452±11.5329 which reduced to 133.5987±8.8952 and 85.8428±9.4259 after treatment, respectively²⁰. But a study done by Qidwai and fellows (2009) offered almost same results between cases and controls²¹. The findings of a study performed by Saumi and Bukhari (2015) also confirmed that after treatment with NS, the SBP and DBP were significantly reduced among patients when compared with baseline²².

CONCLUSION

We concluded that Nigella Sativa seeds have anti-hypertensive effect and significantly reduce the blood pressure among patients with hypertension. Further studies are required to be conducted on vast level to know the antihypertensive effect of Nigella Sativa seeds among patients with hypertension.

Authors' Contribution: AHS&NK: Conceptualized the study, analyzed the data, and formulated the initial draft, SN&AM: Contributed to the histomorphological evaluation, SAK&IA: Contributed to the analysis of data and proofread the draft, TL: Contributed to the proofreading the manuscript for intellectual content.

Limitations: Our study had limitations like financial constraints, lack of resources and lack of genetic workup.

Conflict of Interest: None to declare

Financial Disclosure: None

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