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Original Research

EFFECT OF *NIGELLA SATIVA* OIL ON BLOOD PRESSURE IN ADULTS WITH HYPERTENSION IN KENDARI INDONESIA

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ABSTRACT
Background: Hypertension remains a big challenge for people in Indonesia, especially in adults. Therefore, an effort to reduce high blood pressure is needed. *Nigella sativa* or known as *habbatussauda* is one of herbs that is assumed to be able to reduce high blood pressure.
Objective: This study aims to determine the effect of *nigella sativa* oil on blood pressure in hypertensive adults.
Method: A quasi-experimental research design with pretest-posttest with control group design. A total of 60 respondents were selected using simple random sampling technique, which 30 were randomly assigned in an intervention and a control group. *Nigella sativa* oil was given every day for three months. Data were analyzed using descriptive statistics and ANOVA.
Results: There was a significant effect *of nigella sativa* oil on changes in systolic and diastolic blood pressure (p<0.001).
Conclusion: *Nigella sativa* oil is significantly reducing blood pressure among adults with hypertension. Therefore, *nigella sativa* oil can be used as an alternative therapy for hypertension.

Keywords: *nigella sativa* oil, blood pressure, hypertension

BACKGROUND

Hypertension is defined as blood pressure ≥140 / 90 millimeters of mercury (mmHg) (Bell, Twiggs, Olin, & Date, 2015). The exact cause of this disease is not yet known with certainty but indirectly the factors that play a role in hypertension are intake of salt, potassium, calcium and magnesium, obesity, alcohol, stress, exercise, and other dietary factors (Beevers, Lip, & O'Brien, 2014). Increased blood pressure is a major cardiovascular risk factor. Until now, hypertension still a big challenge in Indonesia and often found in primary health care services (Kementerian Kesehatan RI, 2013; World Health Organization, 2014). In Southeast Sulawesi, hypertension was the most common disease in 2016, amounting to 18,054 cases, while for Kendari it was 9,542 cases (Dinas Kesehatan Sultra, 2017). Likewise, in Poasia Health Center, hypertension is the most degenerative disease in the top 20 diseases. The visit of hypertension sufferers in 2017 was 1600 cases (Puskesmas Poasia, 2018).

Uncontrolled hypertension will cause new problems such as heart disease, chest pain, stroke (World Health Organization, 2019). Pharmacological therapy currently given only control the incidence of transient hypertension.

However, this therapy causes side effects. Thus, we need an alternative therapy that can control hypertension without causing side effects. Modification of effective non-pharmacological lifestyle can reduce blood pressure and antihypertensive drugs. The combination of two or more lifestyle modifications produces better results (O'Brien, Beevers, & Marshall, 1995).

In recent years, there has been a lot of interest in developing herbs to deal with cardiovascular diseases such as hypertension. One of the herbs that has the property to reduce high blood pressure is *nigella sativa* or commonly called *black seed*. In Indonesia this herb is called *black cumin* which is a flowering plant that grows with a height of 20-30 cm with a nutritional composition consisting of oil 31-35.5%, protein 16-19.9%, carbohydrates 33-34%, fiber 4.5 -6.5%, ash 3.7-7%, *saponins* 0.013, moisture 5-7% (Sharif, 2013). *Nigella sativa* containing fixed oil, *thymoquinone, nigelleon*, vitamins A, B, C and niacin which have antioxidant, anti-inflammatory, anti-histamine and anti-tumor properties (Sharif, 2013). There are good antioxidant effects for sufferers of cardiovascular disease. Nigella sativa superoxide dismutase (SOD), catalase (CAT), glutathione-peroxidase (GPx), glutathione reductase (GR) and glutathione transferase (GST) which are known as protective elements to remove reactive free radicals (Sultan et al., 2015). One form of *nigella sativa* extract which has properties in reducing blood pressure is *nigella sativa* oil.

The purpose of this study was to determine the effect of *nigella sativa* oil in reducing blood pressure in hypertensive adults in Poasia Health Center, Kendari City, Indonesia.

METHODS

Study Design
The research design used in this study was quasi-experimental research with the pretest-posttest with control group design.

Participants
The total population of hypertensive patients was 1600 patients with hypertension. Using Jacob Cohen standard, the sample for this study should be at least 25 samples per group. To increase the power, 30 participants per group were recruited (Cohen, 1992). A simple random sampling technique was used to select the participants. Inclusion criteria of the participants were hypertensive adults (19-40 years old) without any complications in the working area of Poasia Health Center in Kendari.

Instrument
A sphygmomanometer and a stethoscope were used to measure blood pressure.

Data Collection
Data were collected from July until October 2019. The experimental group was given nigella sativa oil as much as 500 mg a day for three months, while the control group was not given any interventions. Blood pressure was measured before and after intervention.

Data Analysis
Data were analyzed using descriptive statistics and ANOVA to examine the effect of intervention.

Ethical Considerations
This study was approved by the IAKMI health research ethics committee with No. 002 / KEPK-IAKMI / V / 2019. Signs of verbal agreement were also obtained from respondents who participated in the study that the research conducted did not cause harm or harm to respondents.

RESULTS

Table 1 illustrates that respondents in both control and intervention groups were dominated by female respondents (85%) with an average age of 37.32 years.

Table 2 shows that the there was a significant effect of *nigella sativa* oil on changes in systolic blood pressure in hypertensive patients with a *p* value of <0.001. And Table 3 shows that there was a significant effect of *nigella sativa* oil on changes in diastolic blood pressure in patients with hypertension with a *p* value of <0.001.

Table 1 Characteristics of Respondents

Characteristics of Respondents	Frequency	Percentage
Gender		
Male	9	15
Female	51	85
Age	Mean	SD
	37.32	3.977

Table 2 Systolic Blood pressure Analysis of *Nigella Sativa* Oil

Systole Analysis	Type III Sum of Squared	df	Mean Square	F	Sig.
Time x Group	2083.333	1	2083.333	24.394	<0.001

Table 3 Diastolic Blood Pressure Analysis of *Nigella Sativa* Oil

Diastole Analysis	Type III Sum of Squared	df	Mean Square	F	Sig.
Time x Group	1.203.333	1	1.203.333	22.333	<0.001

DISCUSSION

Findings of this study indicated that there was a significant effect of *nigella sativa* in reducing blood pressure among adults with hypertension. It is believed that *nigella sativa* has a vasorelieve effect on blood pressure. A previous study revealed that vasorelaxant effect of *nigella sativa* induces relaxation depending on concentration in the aortic ring precontracted by PE and KCl. *Nigella sativa* seed extracts give rise to relaxation in the aortic ring contracted by KCl and PE. Vasocontraction or vasorelaxation depends on endothelium production. PE, an adrenoreceptor agonist, causes contraction of the aorta by Ca2 + entering via ROCC and release by Ca2 + from the sarcoplasmic reticulum. *Nigella sativa* inhibits aortic ring contraction caused by PE. *Nigella sativa* also reduces aortic contraction when PE is produced by stable contractions followed by Ca2 + and gradually entering Ca2 +, nigella sativa seeds block ROCC to reduce extracellular Ca2 + entry which is an important mechanism in aortic relaxation. Therefore, *nigella sativa* reduces hypertension (Niazmand, Fereidouni, Mahmoudabady, & Mousavi, 2014).

Black cumin seeds can traditionally be used as an antihypertensive including several other health problems such as digestive disorders and skin diseases (Gilani, Jabeen, & Khan, 2004). A study concluded that strong and beneficial activity in *nigella sativa* oil and protein components has a positive role on antioxidants in brain development and has been widely used as an antihypertensive (Gilani et al., 2004). Similar with a previous study that *nigella sativa* seed extract 100 mg and 200 mg could reduce blood pressure significantly (Dehkordi & Kamkhah, 2008).

It is also in line with a study conducted by Ramadan, Asker, and Tadros (2012), which aims to determine the antiradical and antimicrobial properties of cold black cumin oil extracts and cumin oil extracts that its results indicated that cold-pressed black cumin seed oil (BCSO) and cumin seed oil (CSO) have PUFA content of 37.6 and 58.7 g / 100g total fatty acids and MUFA, 24.1 and 47.5g / 100g total fatty acid could reduce

cardiovascular disease, inflammation, atherosclerosis, autoimmune disorders, diabetes and other diseases (Ramadan et al., 2012). This study is in line with the research conducted by Rezq (2014), which used *nigella sativa* oil combined with vitamin E on oxidative stress in rats conducted on 49 adult male rats for 8 weeks divided into the results that the group given NSE and NSO, which significantly decreased serum AST, ALT, TC and TG levels (Rezq, 2014).

CONCLUSION

There is a significant effect of *nigella sativa* oil in reducing blood pressure in hypertensive adults. This study provides an input specifically for the Poasia Health Center and the people in Kendari in general. Adult patients with hypertension are recommended to consume *nigella sativa* oil as an alternative therapy to control blood pressure without side effects.

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