Effect of administering black cumin (*Nigella sativa*) toward postpartum mice (*Mus Musculus L.*)

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**Abstract.** The period of childbirth is a period that is risky for the health provider monitoring that less monitoring can cause the mother to suffer a variety of problems and complications during childbirth such as post-partum infections. This type of research was an experimental group P0: control group, treatment groups by administering *Nigella sativa* P1: 2.6mg/day, P2: 3.9mg/day, P3: 5.2mg/day, and P4: 6.5mg/day, which each group 5 samples. The average amount of leukocytes after given *Nigella sativa* 2.6mg/day for seven days (P1) which was $7.10 \pm 0.57 \times 10^3$ cells/mm$^3$, and at least in female mice after given *Nigella sativa* 6.5mg/day for sevendays (P4) which was $6.62 \pm 0.52 \times 10^3$ cells/mm$^3$. The average amount lymphocytes after given *Nigella sativa* 2.6mg/day for seven days (P1) which was $63.40 \pm 4.77 \times 10^3$ cells/mm$^3$, and least in female mice after given *Nigella sativa* 3.9mg/day for seven days (P3) which was $47.00 \pm 14.58 \times 10^3$ cells/mm$^3$. Amount of monocytes after given *Nigella sativa* 5.2mg/day for seven days (P3) which was $5.40 \pm 0.55 \times 10^3$ cells/mm$^3$, and least in female mice after given *Nigella sativa* 2.6mg/day for seven days (P1) which was $4.80 \pm 1.30 \times 10^3$ cells/mm$^3$.

1. Introduction

The period of childbirth is a period that is risky for the health provider monitoring that less monitoring can cause the mother to suffer a variety of problems and complications during childbirth such as post-partum infections. This type of research was an experimental group P0: control group, treatment groups by administering *Nigella sativa* P1: 2.6mg/day, P2: 3.9mg/day, P3: 5.2mg/day, and P4: 6.5mg/day, which each group 5 samples. The average amount of leukocytes after given *Nigella sativa* 2.6mg/day for seven days (P1) which was $7.10 \pm 0.57 \times 10^3$ cells/mm$^3$, and at least in female mice after given *Nigella sativa* 6.5mg/day for sevendays (P4) which was $6.62 \pm 0.52 \times 10^3$ cells/mm$^3$. The average amount lymphocytes after given *Nigella sativa* 2.6mg/day for seven days (P1) which was $63.40 \pm 4.77 \times 10^3$ cells/mm$^3$, and least in female mice after given *Nigella sativa* 3.9mg/day for seven days (P3) which was $47.00 \pm 14.58 \times 10^3$ cells/mm$^3$. Amount of monocytes after given *Nigella sativa* 5.2mg/day for seven days (P3) which was $5.40 \pm 0.55 \times 10^3$ cells/mm$^3$, and least in female mice after given *Nigella sativa* 2.6mg/day for seven days (P1) which was $4.80 \pm 1.30 \times 10^3$ cells/mm$^3$.

One of the plants that can be used to boost the immune system is *Nigella sativa* (black cumin) that inhibit apoptosis by inhibiting viral replication, with a decrease in lymphocytes, this process inhibits viral replication in target cells.[5] *Nigella sativa* also known as black cumin, kalonji, habitus cauda, black seed, love in the mist, fitches, black caraway, black onion seed. Charnushka has a therapeutic effect broad and significant to many diseases such as skin diseases, jaundice, indigestion, anorexia, conjunctivitis, dyspepsia, rheumatism, diabetes, hypertension, intrinsic bleeding, paralysis, amenorrhea, asthma cough, bronchitis, headache, fever, influenza, and eczema.[6]
Active substance contents: *thymoquinone, dithymoquinone, thymohydroquinone,* and *thymol.*

*Thymoquinone* active substances principal of volatile oil (essential oil) but it is also made up of amino acids, proteins, carbohydrates, alkaloids, saponins, fatty acids, especially fatty acids essential unsaturated namely *alpha-linolenic* acid (Omega-3) and *linoleic* acid (Omega-6) as forming cells.[7] *Thymoquinone* (TQ) effects the antimicrobial, has a broad antimicrobial spectrum, including gram-negative, gram-positive bacteria, viruses, parasites and fungi Schistosoma [8], by inhibiting inflammator. The result scientific studies extracts seed *Nigella sativa* shown to improve the function of polymorphonuclear cells (PMN), cytokines stimulate Macrophage Activating Factor (MAF) thereby improving the function of macrophages, which play a role in the immune system mobile.[9] *Nigella sativa* has activity as anti-inflammatory and bronchodilation through the mechanism of reduction in eosinophil, IgG1, and IgG2a, inhibition of the enzyme cyclooxygenase (COX) and lipoxygenase. As well as, the inhibition of prostaglandin D2 and activity immunomodulator which plays an important role in the stabilization of Th1 and Th2 closely related to the reaction inflammation.[10] Methanol extracts of *Nigella sativa* seed effectively used in in-vitro assays and in vivo against the bacterium that causes mastitis in cows injected with the bacteria that cause mastitis.[11]

2. Methods

This study had 25 adult female mice (*musculus L*) after giving birth to determine infection prevention management post-partum with alternative methods administering *Nigella sativa.*

Rate incidence of infection through total levels of leukocytes, lymphocyte, and monocytes mice adult female postpartum (*musculus L*) after administering *Nigella sativa* in the control group and the intervention group with P1 dose: 2.6mg/day, P2: 3.9mg/day, P3: 5.2mg/day, P4: 6.5mg/day.

Implementation of extraction *Nigella sativa* held for one week. Its activities consist of refining cumin in a blender, the determination of the amount of the judgment, and then soaked with ethanol for 24 hours. Then the material is filtered or passed through the refining process (filtration). The next process material extract obtained was concentrated using a rotary evaporator at 70% according to the boiling point of ethanol to obtain a thick extract is used for the sample.

3. Results

3.1. Amount of leukocytes

The average amount of leukocytes of female mice after childbirth of each treatment found to be most numerous in the group after getting treatment given *Nigella sativa* 2.6mg/day for 7 days (P1) which is 7:10±0.57 (x10^3 cells/mm^3), and at least in female mice after getting treatment given *Nigella sativa* 6.5mg/day for 7 days (P4) which is 6.62±0.52 (x10^3 cells/mm^3). Both results respectively compared to the control results found no real difference. Similarly, between each treatment when compared to one another with the treatment they found no significant difference.

| Treatment | Leukocytes (x10^3 cells/mm^3) |
|-----------|-------------------------------|
| P0        | 6.00 ± 1.06                   |
| P1        | 7.10 ± 0.57                   |
| P2        | 6.58 ± 0.35                   |
| P3        | 6.34 ± 0.44                   |
| P4        | 6.62 ± 0.52                   |

3.2. Amount of lymphocytes

After an assessment of the amount lymphocytes female mice after childbirth and given *Nigella sativa* in each group showed the average amount of lymphocytes female mice after give birth of each treatment was found to be most numerous in the group after getting treatment given *Nigella*
sativa 2.6mg/day for 7 days (P1) which is 63.40±4.77 \(\times 10^3\) cells/mm\(^3\), but in female mice after getting treatment given *Nigella sativa* 3.9mg/day for 7 days (P3) which is 47.00±14.58 \(\times 10^3\) cells/mm\(^3\). But both the results compared with the respective control results found no real difference. Results between each treatment compared with other treatments one still found no real difference.

### Table 2. The average amount of lymphocytes.

| Treatment | Lymphocytes \(\times 10^3\) cells/mm\(^3\) |
|-----------|------------------------------------------|
| P0        | 59.40 ± 8.29                             |
| P1        | 63.40 ± 4.77                             |
| P2        | 58.80 ± 2.59                             |
| P3        | 47.00 ± 14.58                            |
| P4        | 53.40 ± 8.32                             |

#### 3.3. Amount of monocytes

After an assessment of the amount of monocytes female mice after childbirth and given *Nigella sativa* in each group showed the most numerous in the group after getting treatment given *Nigella sativa* 5.2mg/day for 7 days (P3) which is 5.40±0.55 \(\times 10^3\) cells/mm\(^3\), but in female mice after getting treatment given *Nigella sativa* 2.6mg/day for 7 days (P1) which is 4.80±1.30 \(\times 10^3\) cells/mm\(^3\), but both results when respectively compared to the control results found no real difference. For results of each treatment compared with other treatments one not found a noticeable difference.

### Table 3. The average amount of monocytes.

| Treatment | Monocytes \(\times 10^3\) cells/mm\(^3\) |
|-----------|---------------------------------------|
| P0        | 6.40 ± 0.89                           |
| P1        | 4.80 ± 1.30                           |
| P2        | 5.20 ± 1.10                           |
| P3        | 5.40 ± 0.55                           |
| P4        | 5.00 ± 0.71                           |

#### 4. Discussion

In this study found the average amount of leukocytes, lymphocytes, and monocytes show the change in the direction of normal but showed no real difference in either the control group or an intervention group. Levels of leukocytes, lymphocytes, and monocytes were found on average showed normal values. It ensures that *Nigella sativa* influence to increase and decrease the levels of leukocytes. Increased levels of leukocytes to the condition after childbirth due to the resistance to the possibility of infection that can be from the birth way of body defense mediated effector mechanisms of innate immunity and adaptive immunity. Innate Immunity consists of cellular and biochemical defense mechanisms that have been formed even before the infection. Innate immunity is also called non-specific immunity. In contrast to innate immunity, adaptive immunity is an immune response that is stimulated by the entry of infectious agents and adapt to such infections. Adaptive immunity have extra capacity of distinguishing assortment of microbes and molecules are very similar, so it is also called specific immunity.

Hexane extracts of black cumin seeds (Nigella sativalour) can enhance the activity of macrophage female mice strains.[12] Other benefits also can strengthen the immune system against viruses and bacteria. One of the properties tested for the immune system is black cumin can increase the number of lymphocytes and monocytes. Black cumin can increase the ratio of T helper cells to suppressor T-cells by 72% which means increasing the functional activity of immune cells.[13]

The results of this study different from the results of research Zikria who found that the ethanol extract of black cumin in mice was able to influence the amount of total leukocyte and lymphocyte...
percentage with results significantly different (p<0.05) but not able to affect the percentage of monocytes.[14]

Monocytes are one of the nucleated leukocytes with the double size larger than erythrocytes red blood cells. Levels also the largest in the blood circulation and lymphatic tissue produced. The normal value in the body:2-8% of all leukocytes. The increase in monocytes present in viral infections, parasites (e.g., worms), cancer, etc. While the decline in monocytes present in lymphocyte leukemia and aplastic anemia. For lymphocyte, this is one of the leukocytes that play a role in immune processes and the formation of antibodies. The normal value:20-35% of all leukocytes. Increased lymphocyte leukemia contained in lymphocytic, viral infections, chronic infections, etc. The decrease in lymphocytes occurs in patients with cancer, aplastic anemia, kidney failure, etc.[15]

5. Conclusions
Based on the results and the above discussion, it can be a conclusion that provision of Nigella sativa did not affect the average number of leukocytes, lymphocytes, and monocytes in adult female mice (musculus L.) after childbirth.

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