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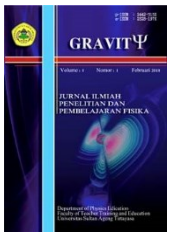

The effect of black cumin extract (*Nigella sativa*) on the liver SPGT levels of rats (*Rattus norvegicus*) induced by Piroxicam

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ABSTRACT

Piroxicam is a non-steroidal anti-inflammatory drug (NSAID) that can cause side effects on the liver. If the liver is affected by side effects from using Piroxicam, it can cause cell damage so that the hepatic organs' function and work are disturbed. The biomarker of liver damage is the SGPT level. An increase in the SGPT ratio indicates great liver damage. One way to minimize liver damage is by giving antioxidants. One of the many herbal plants used to prevent or treat various diseases is black cumin (*Nigella sativa*). This study aimed to analyze the effect of black cumin extract on the liver SGPT levels of Piroxicam-induced rats. 80 male mice were used in this study and were divided into 3 groups, namely the negative control group (K-), Piroxicam non-extract (P-), and Piroxicam plus extract (P+). Black cumin extract is given orally at a dose of 2 g/kgBW; 3 g/kgBW; 4 g/kgBW; 5 g/kgBW and 6 g/kgBW, while the Piroxicam dosage given is 1 g/kgBW and 3 g/kgBW. The results showed that the more Piroxicam doses were given, the higher the SGPT level. Along with the increase in the dose of black cumin extract, the SGPT level is reduced.

Keywords: black cumin, liver, piroxicam,

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INTRODUCTION

Piroxicam is a non-steroidal anti-inflammatory drug (NSAID) with a new structure, namely oxicam, an enolic acid derivative. In general, NSAIDs can cause side effects in three organs, including the digestive tract, liver, and kidneys (Pairul, 2018). The longer the half-life of NSAIDs, such as Piroxicam, the easier it will be accumulation (buildup) in a person's body, which will cause toxic effects (Ramadhan, 2015).

The liver, as a detoxification organ, can neutralize all toxins in the body. However, if the liver is affected by side effects from using Piroxicam, it can cause cell damage so that the hepatic organs' function and work are disturbed. The biomarker of liver damage is the SGPT level. An increase in the SGPT ratio indicates high liver damage (Hidayat, Christijanti & Marianti, 2013).

One way to minimize liver damage is by giving antioxidants. One of the many herbal plants used to prevent or treat various diseases is black cumin. Black cumin (Nigella sativa) contains main components, including timokinones, fatty substances, protein, potassium, melantin (saponins), nigellin (bitter substances), nigelon, and tanning substances (Himawan, et al., 2016).

Timoquinone substances have antibacterial, antioxidant, antihistamine, anti-inflammatory, antidiabetic, analgesic, antipyretic, and antineoplastic effects. Black cumin also contains high fatty acids, namely linoleic acid or omega 6, in fixed oil as other active substances besides timoquinone (Diana, 2016). Black cumin therapy from Habasyah 2000 mg/ day for 50 days can significantly reduce systolic and diastolic blood pressure before and after treatment (Saumi, 2011). Black cumin oil is very influential in the process of reducing the scale of pain, exudate, and malodor in cancer wounds (Yulistiani & Dedy, 2016).

Black cumin has antiviral, antifungal, antibacterial, antihypertensive, and antiparasitic properties. Black cumin extract has also been shown to increase the non-specific and specific immune system (Novisa, Tarsim & Harpeni, 2015). Black cumin contains an active ingredient in the form of nigelon, which functions as a stabilizer in the immune system during growth and functions to suppress antihistamines that cause asthma, bronchitis, neurodermatitis, and allergies (Ningtyas, 2012).

Black cumin seed extract with thymoquinone as the primary active substance has a cytotoxic effect on human cancer cell lines, liver anticancer, immunomodulation (increased cell function (T and B lymphocytes, NK cells, macrophage cells, CTL cells, IL-2 and 3 production, TNF-β4) and induces apoptosis Thymoquinone is also known to inhibit cancer cells that have been resistant to previous anticancer treatments such as cisplatin and doxorubicin. 50% against liver cancers Ehrilch Ascites Carcinoma (EAC), DSPGTon's Lymphoma Ascites (DLA), and cancer cells Sarcoma-180 and in vivo can completely inhibit the development of EAC (Putri, Mirani & Mashoedi, 2011).

Black cumin has antioxidant potential by having radical scavenging abilities, which are effective in nonenzymatic lipid peroxidation and deoxyribose degradation. Another study explains that giving rats 1-2 g / KgBW / day of black cumin extract for 10 days can show a therapeutic effect (Sirait, Tjahjono & Setyawati, 2016).

RESEARCH METHODS

This study used 80 male rats with an average body weight of 180-200 gram. The mice were grouped into 3 groups, namely K- (without Piroxicam and extract), P- (Piroxicam without extract), and P+ (given Piroxicam then extract). The doses of Piroxicam used were 1 g/kgBW and 3 g/kgBW, while the black cumin extract was given in five dose variations, namely 2 g/kgBW; 3 g/kgBW; 4 g/kgBW; 5 g/ kgBW and 6 g/kgBW.

Giving of Piroxicam. Piroxicam given to mice is a finished powder that has been packaged and sold in the market, taking into account the composition contained therein. One Piroxicam capsule contains 10 mg. The dose of Piroxicam given to mice was calculated based on the bodyweight of each rat. Piroxicam was given once a day for 7 days before the rats were given black cumin extract by force-feeding them using a gastric swab.

Giving of Black Cumin Extract. Black cumin extract given to mice is a finished powder that has been packaged and sold in the market, taking into account the composition contained in it. One black cumin extract capsule contains 600 mg. The dose of black cumin extract given to mice was calculated based on the bodyweight of each rat. The black cumin extract was shown once a day for 7 days after the rats were given Piroxicam by force-feeding the rats using a gastric swab.

Preparation of Histology. The rats that had been operated on had their hepatic organs removed. The rats' livers were dehydrated and then cut with a microtome. Pieces of the liver were rehydrated, and HE stained. Furthermore, it can be observed under a microscope.

RESULTS AND DISCUSSION

The parameter that indicates liver damage is the level of the SGPT enzyme in the blood. If the liver cells are damaged, it will cause an increase in SPGT levels in the blood serum.

Figure 1 shows a graph of the relationship between the number of Piroxicam doses on the

liver SPGT levels in rats. The amount of Piroxicam in mice with 2 variations of the quantity, namely 1 g / kg BW and 3 g / kg BW, showed that the more Piroxicam doses were given, the higher the SGPT level.

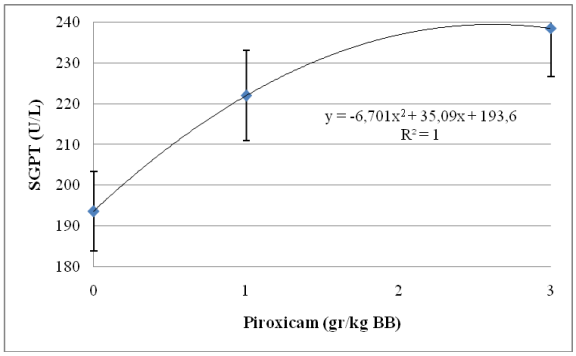

Figure 1. The relationship between the number of Piroxicam doses and the SPGT levels in the rat liver

This indicates that the liver damage of the mice is getting worse. In the adverse control treatment, the level of SGPT in the blood was 193.62 U/L. In the Piroxicam treatment of 1 g/ kgBW and 3 g/kgBW, the levels of SGPT in the blood were 222.01 U/L and 238.58 U/L, respectively. SGPT is a biomarker of liver damage. If the liver cells are damaged, it will cause an increase in SGPT levels in blood serum (Sari, Widodo & Juswono, 2015). If the liver cells are normal, SPGT remains in the cells. SPGThough some leave the cells and enter the blood vessels, the amount or level is only tiny. If the liver cells are damaged, and the walls are broken, the SGPT will leave the cells and enter the bloodstream, resulting in high levels (Candra, 2013).

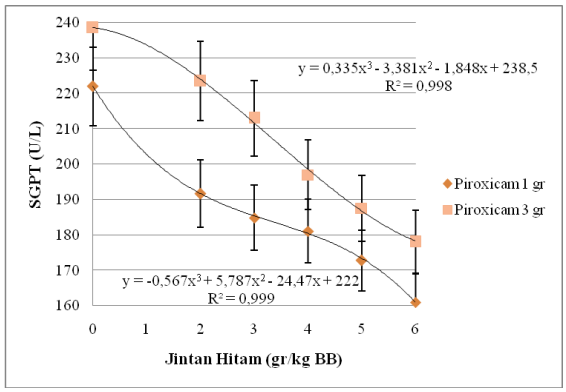

Figure 2. The relationship between the number of doses of black cumin extract on the liver SGPT levels in rats

Figure 2 shows the relationship between the number of doses of black cumin extract given to the liver SGPT levels in rats. There was a significant decrease between the rats that were given only Piroxicam and the rats that were given Piroxicam and then given the black cumin extract, namely from 222.01 U/L decreased to 160.99 U/L in the Piroxicam treatment 1 g/kgBW, and 238,58 U/L decreased to 178.08 U/L in the Piroxicam 3 g/ kgBW treatment. This is because black cumin is an antioxidant that can prevent or ward off free radicals caused by excessive Piroxicam doses.

The toxic effect is due to the presence of lipid peroxidation. Lipid peroxidation causes hepatic cell necrosis. The necrosis causes the nucleus to swell. The cytoplasm becomes ruptured so that the cell's contents, such as the SGPT enzyme, enter the extracellular tissue due to interference with the sodium pump caused by a deficiency of ATP. ATP plays an essential role in the integrity of hepatocyte cells. If the ATP level is low, the intracellular enzymes will come out of the blood, causing damage to the liver (Fajaryah, 2010).

From the SGPT results, it appears that black cumin can prevent the increase in SGPT levels due to Piroxicam administration. Black cumin inhibits the breakdown of hepatic cells due to the presence of free radicals (ROS). Several chemical compounds in black cumin act as antioxidants that can ward off free radicals (Febrina, 2012).

CONCLUSION

Piroxicam has side effects, especially on the liver. The black cumin extract given as a treatment for the effects of Piroxicam was able to reduce the liver SGPT levels of rats from 222.01 U/L to 160.99 U/L in Piroxicam 1 g/ kgBW treatment, and 238.58 U / L decreased to 178,08 U/L in Piroxicam treatment 3 g/ kgBW. Black cumin extract contains bioactive antioxidant compounds that can inhibit the breakdown of liver cells due to free radicals (ROS).

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