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VARITIONS IN BODY WEIGH AND BONY LENGTH OF THE FETUS RATTUS NORVEGICUS ALBINO WISTAR STAIN GIVEN COFFEE WITH INCREASED LEVELS

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ABSTRACT

The fetus gets everything it needs through the bloodstream including nutrition, oxygenation, if it is blocked the fetus will lack all that is needed for growth and development. As a result, the narrowing of the blood vessels may be able to result in impaired growth and developmental disorders can occur. The caffeine in coffee during pregnancy crosses the placenta and reaches the baby, thereby reducing blood flow to the placenta, thus endangering the baby. Food and drag administration in 1980, found that caffeine crosses the brain and blood barrier and it is thought that the fetus may not have the enzymes needed to detoxify itself from caffeine through a process known as demethylation. Some scientists also try to determine how caffeine interferes with cell growth and fetal development. Various epidemiological studies show that there is a strong relationship of the effects of caffeine. The risk of miscarriage in pregnant women who consume a cup or more of coffee per day was shown in a 1998 study. Other studies have shown that coffee can cause weight loss in babies for children and also an increased rate of abortion spontaneous. This type of research is an experiment with a post test only control group design research design that is a design used to measure the effect of treatment in the experimental group by comparing treatment results with the control group ending the treatment period. The study was conducted at the Anatomy Stikes Cup of Sakti Pariaman Cup. The extraction was carried out in the L2DIKTI SUMBAR RIAU JAMBI Laboratory. This research was conducted from March-November 2019. The total number of mice during the study were 32 individuals. The results of this study were tabulated data and analyzed data using SPSS 2007 with the Anova test of 95% confidence level. From the Anova test results it was found that there was a significant relationship between caffeine on body weight and fetal body length of experimental animals with a p value of 0.00.

Keywords: **Body Weight, Body Length, Caffeine**

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INTRODUCTION

The World Health Organization (WHO) and the United States Center for Disease Control and Prevention (CDC) encourage pregnant women not to consume even a single drop of alcohol or caffeine. This is because alcohol consumption during pregnancy can increase the risk of miscarriage and premature birth (WHO, 2012; Aprihatin *et al*., 2020; Arlym *et al*., 2020; Armaita., 2020; Asman *et al*., 2020). Caffeine can cross the placenta thereby increasing heart rate and also fetal respiration. One thing that is of concern is caffeine can reduce the absorption of iron in the mother which theoretically can trigger anemia.

Pregnant women are prone to anemia, so consuming caffeine can have adverse effects and worsen conditions such as dizziness, fatigue and irregular heartbeat. Consuming coffee has become a hereditary tradition in the community (Indika *et al*., 2020; Oktorie and Bert, 2020; Yanti *et al*., 2020; Yuniarti *et al*., 2020), especially in rural areas, including pregnant women, and pregnant women do not care about health. This is due to the lack of knowledge of mothers about the adverse effects of consuming coffee and the absence of counseling about coffee consumption in pregnant women.

Caffeine is a xanthine derivative, has the ability to cross the placental defenses. OTC drugs that contain caffeine and are widely consumed by pregnant women include fever medicines, allergy medications, and headache medications (Samamoto *et al*., 1993; Hermon 2020). Pharmacologically caffeine has the ability to stimulate the central nervous system, increase the resistance of cerebral vascularization, dilate peripheral blood vessels, increase the working capacity of skeletal muscles, gastric acid secretion, cardiac output and stroke volume, moderate diuresis, and cause relaxation of bronchi smooth muscle. At the cellular level, caffeine will decrease DNA polymerase activity and inhibit phosphodiesterase activity.

METHOD

Test Animal Preparation

Choose 28 test animals, age 2-3 months, healthy body weight 18-40 grams. Prepare a mouse cage complete with a feed and drinking water container. Pad cages of

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rice powder are replaced every three days. Test animals that will be used are acclimatized in the cage for 1 week. 28 mice were divided into four groups. The first group is the group without treatment (control), the second group is the group that is given coffee at a dose of 100g / ml, the third group with 200g / ml, and the last group at a dose of 300g / ml.

Caffeine Making (coffee)

Coffee is roasted with a temperature of 1490-2130C. The roasting is stopped when the coffee is easy to solve. This shows that the roasted coffee is ready to be ground to get ground coffee. Coffee powder is put into a measuring cup, then brewed with ethanol water then macerated (soaking) for 24 hours, then filtrated (filtering) separates the water with its pulp, then evaporation (heated) to produce extracts from the coffee. the volume of coffee solution used is as follows: conversion of experimental animals × coffee solution calculation.

RESULTS AND DISCUSSION

Before conducting the test using the Anova test, the normality test is done using the saphirowilk test where data are found to be normally distributed with a P value> 0.00. Statistical analysis with ANOVA test ($\alpha = 0.05$) showed that there was a significant difference between birth weight in the control and treatment groups I, II, III, with a p value of 0,000. From the post hoct test further tests there was a significant difference between body weight the control group for all treatment groups, the same thing was also known in the body length variable that was known to have significant differences between the control group and the treatment group. Significant differences were also found between the first treatment group for the second and third treatments for the weight variable, whereas for the body length variable the difference was seen only in the first treatment group for the third treatment group.

From this study it was found that there were significant differences between the variation in body weight and length of the fetus of experimental animals given multilevel doses of coffee. Daily caffeine consumption research conducted by Martin et al (1987) found that coffee consumption of 150 mg during pregnancy was associated with low birth

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weight at term. There is an increased risk of spontaneous abortion and low birth weight in women who consume more than 150 mg of caffeine per day, or the equivalent of 2 cups of coffee a day. Another study conducted by Eskenazi (1999) found that in addition to weight loss caffeine consumption in pregnancy was associated with spontaneous abortion, prematurity and teratogenicity.

According to Samamoto et al. (1993), the negative effects that appear on the fetus occur because caffeine that crosses the placenta and enters the fetus's circulation extended its half-life. This extended half-life occurs because the fetus does not have enzymes that are essential for caffeine metabolism, so it is likely that caffeine is embryotoxic or teratogenic in the fetus. The same study was reported by Beck and Urbano (1991), which stated that the half-life of caffeine in pregnant women was extended from the usual half-life of 5.3 hours to 18.1 hours. The extended half-life will return to normal immediately after delivery. The extended period of caffeine half-life in pregnant women coincides with the period of fetal development, so that the accumulation of this substance has quite a potential risk to the fetus and placenta responsible for nutrient transfer.

CONCLUSION

Laboratory studies in experimental animals have shown teratogenic effects if caffeine is given at very high doses (equivalent to 12-24 cups of coffee per day in humans). In humans, epidemiological data show that at doses of more than 300 mg of caffeine per day (equivalent to caffeine found in 2-3 cups of coffee) can cause spontaneous abortion or interference with the rhythm of a baby's heart rate. Pregnant women who consume more than 300 mg of caffeine a day during pregnancy have a tendency to give birth to babies with low birth weight. The risk increases with higher consumption. There is a relationship between the occurrence of Suddent Infant Death Syndrome (SIDS) with large doses of caffeine during pregnancy. From this study it is hoped that the effects of caffeine on birth weight and histological features of the white rat as a confirmation of the available data have been obtained which have been obtained mostly through epidemiological studies.

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