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The Effect of Brown Rice Consumption on Blood Sugar Levels in Menopause in Tamanan Village, Kediri City in 2022

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ABSTRACT

Increased blood sugar occurs at menopause age because at the age of menopause there is an increase in blood components which results in blood sugar levels being higher and difficult to reduce if not with regular injections of the hormone insulin. Blood sugar disease occurs due to disorders of the pancreas gland which can disrupt the production of the hormone insulin. Based on a preliminary study in Tamanan Village on 30 menopausal women respondents, 20 of them (66.67%) suffered from increased blood sugar levels. The purpose of this study was to determine the effect of brown rice consumption on blood sugar levels in menopause. The research design used was a pre-experimental study with a one-group pretest-posttest design. The population in this study were all postmenopausal women who experienced an increase in blood sugar levels in Tamanan village. By purposive sampling, a sample of 16 people was obtained. The research instrument used was an observation sheet. Data were analyzed using *paired t-test*. The results showed that the average blood sugar level before giving brown rice was 131.94 mg/dl. The average blood sugar level after being given brown rice was 123.56 mg/dl. From the results of statistical tests with = 0.05 obtained p value = 0.000 so that p-value < then H0 is rejected and H1 is accepted. This study concludes that there is an effect of the consumption of brown rice on blood sugar levels during menopause. Based on the research results, postmenopausal women should consume brown rice and pay attention to the consumption of balanced nutrition, so that blood sugar levels are controlled and health status can be optimal.

Keywords: Blood sugar levels, Brown rice, Menopause

INTRODUCTION

Menopause is the permanent cessation of menstruation for 12 months due to estrogen deficiency and is not associated with pathology. The median age of menopause is 51 years. Most women experience vasomotor symptoms, but menopause affects many other areas of the body such as urogenital. psychogenic, and cardiovascular (Soares CN, 2019; Vishwakarma et al, 2019). The hormones estrogen and progesterone affect how the body's cells respond to insulin. After menopause, changes in the body's hormone levels can trigger fluctuations in blood sugar levels. This causes blood sugar levels to be more difficult to predict than in the pre-menopausal period. If blood sugar levels are not controlled, they will have a higher risk of diabetes complications.

After menopause, changes in the body's hormone levels can trigger fluctuations in blood sugar levels. This causes blood sugar levels to be more difficult to predict than in the pre-menopausal period. If blood sugar levels are not controlled, they will have a higher risk of diabetes complications. Increased blood sugar occurs at menopause age because at the age of menopause there is an increase in blood components which results in blood sugar levels being higher and difficult to reduce if not with regular injections of the hormone insulin. Blood sugar disease occurs due to disorders of the pancreas gland which can cause disruption of the production of the hormone insulin. If the production of this hormone is disturbed, it will cause diabetes. This diabetes is indicated by a lack or no formation of the hormone insulin, if the insulin hormone produced by the pancreas is no longer sufficient in number for the normal carbohydrate metabolism process, as a result most of the glucose consumed cannot be converted into glycogen so that blood sugar in postmenopausal women increases. hyperglycemia). While some of the excess glucose in the blood will be excreted through the urine (Nathan, 2010).

Causes of high blood sugar levels, namely causes that come from within the human body itself (damage to the pancreas, insulin resistance, decreased insulin quality, genetic or hereditary factors) and causes that come from outside the body itself (irregular diet, obesity). Obesity, a side effect of using chemical drugs (Kilvert, 2017).The treatment effort that can be done is to live a healthy life, namely by consuming healthy food, drinks, adequate nutrition, especially by consuming foods containing brown rice, corn, exercise, lifestyle live a healthy life by not smoking and not drinking alcohol. Foodstuffs that can be used as an alternative in controlling blood sugar are brown rice. Brown rice has a glycemic index content of below 50 which is moderate. In addition to the glycemic index, fiber is also one of the nutrients superior brown rice. Fiber is important for diabetics because of fiber intake enough will help the body control blood sugar and increase satiety (Malik VS et al, 2019).

The results of a previous study conducted by BUI TN et al (2014) showed that replacing white rice with brown rice for 4 months can lose weight and control blood glucose levels. Research conducted by Wirstrom et al (2013) showed that consuming 370 grams of brown rice per day can reduce blood glucose in people with Diabetes Mellitus. Furthermore, research conducted by Hu et al (2012) showed that consuming 59.1 grams of whole grain per day for 8-10 years had a 22% lower risk of glucose metabolism disorders than those who ate less than 30.6 grams a day. This study aims to determine the effect of brown rice consumption on blood sugar levels in menopause. This study used a pre-experimental design with one group pretest-posttest design. The sample in this study was some menopausal women with criteria for menopausal women who experienced increased blood sugar levels and did not take drugs during the study.

MATERIALS AND METHODS

Design and Samples

The research design used in this study was pre-experimental with one group pretest-posttest design. The population in this study were all postmenopausal women who experienced an increase in blood sugar levels. The sample in this study was some menopausal women with criteria for menopausal women who experienced increased blood sugar levels and did not take drugs during the study. Obtained a large sample of 16 people. The sampling technique used was purposive sampling. The independent variable studied was the provision of brown rice and the dependent variable was blood sugar levels. The research instrument used is the observation sheet

Data Collection

Before giving brown rice, the mother's blood sugar levels were checked using the Eacy Touch GCU, then the researcher told the respondents to consume brown rice 3 times a day (3x100 gr) for 7 days, the researchers ensured that all respondents consumed the given brown rice until it was finished. After brown rice is consumed for 1 week on the last day 2 hours after administration, the researcher tests blood sugar levels to see changes in blood sugar levels.

Data Analysis

Research data were analyzed using paired t-test

RESULTS

1. General Data

Tabel 1. Characteristics of Respondents Based on Age

Age	Frekuensi	Prosentase
50-55 years old	6	37.5
56-60 years old	8	50
> 60 years old	2	12.5
Total	16	100

The table above shows that half of the respondents (50%) are 56-60 years old

Tabel 2. Characteristics of Respondents Based on Parity

Paritas	Frekuensi	Prosentase
Primipara	4	25
Multipara	10	62.5
Grande multipara	2	12.5
Total	16	100

The table above shows that most of the respondents (62.5%) are multiparous mothers

Tabel 3. Characteristics of Respondents Based on Occupation

Occupation	Frekuensi	Prosentase
IRT	9	56.3
Petani	3	18.8
Wiraswasta	2	12.5
PNS	2	12.5
Total	16	100

The table above shows that most of the respondents (56.3%) are housewives.

2. Special Data

Table 5. Blood Sugar Levels Before Giving Brown Rice

Variabel	N	Mean	SD	Minimum	Maximum
Blood sugar levels before treatment	16	131,94	5,026	126	141

The table above shows that the average blood sugar level before giving brown rice was 131.94 mg/dl. From the results of the normality test with Shapiro-wilk obtained p-value 0.088> so that the data distribution is normal.

Table 6. Blood Sugar Levels After Giving Brown Rice

Variabel	N	Mean	SD	Minimum	Maximum
Blood sugar levels after treatment	16	123,56	5,633	116	138

The table above shows that blood sugar levels after being given brown rice were on average 123.56 mg/dl. From the results of the normality test with Shapiro-wilk obtained p-value 0.107 > so that the data distribution is normal.

Table 7. Analysis of Differences in Blood Sugar Levels Before and After Giving Brown Rice

Blood Sugar	Mean	Std. Deviation	Std. Error Mean
Before	131,94	5,026	1,257
After	123,56	5,633	1,408
P value : 0,000	α = 0,05		

The table above shows that blood sugar levels before giving brown rice an average of 131.94 mg/dl and blood sugar levels after giving brown rice an average of 123.56 mg/dl. These data indicate that there is a decrease in blood sugar levels after giving brown rice. The results of the paired t-test showed that = 0.000 so that <0.05, then H0 was rejected and H1 was accepted, which means that there is an effect of giving brown rice to menopausal women's blood sugar levels.

DISCUSSION

Changes in blood sugar levels at the age of menopause are due to an increase in blood components which results in blood sugar levels being higher and difficult to reduce if not with regular injections of the hormone insulin. Blood sugar disease occurs due to disorders of the pancreas gland which can cause disruption of the production of the hormone insulin. Brown rice (Oriza Nivara) is part of an herbal plant that contains carbohydrates, fats, protein, fiber and minerals. It also contains flavonoid compounds that have anti-diabetic abilities that lower blood glucose by increasing insulin secretion and preventing insulin resistance (Firdausya & Amalia, 2020)

The process of changing blood glucose by giving brown rice (Oriza Nivara) is due to the high fiber content in brown rice. The benefits of fiber in brown rice can increase the viscosity of the lumen in the intestine so that it can reduce the efficiency of carbohydrate absorption and insulin response. With decreased insulin response, the work of the pancreas will be lighter in producing insulin. Brown rice (Oriza Nivara) can also reduce lipid levels in serum so that it can suppress glucose levels in the blood. In addition, brown rice contains the mineral selenium and anthocyanin pigments (red) which function as antioxidants and are inhibitors of various degenerative diseases including diabetes mellitus (Kuszairi, 2017; Setyawati et al, 2020).

The high fiber content in brown rice is associated with a lower glycemic index, a longer feeling of fullness which can lead to weight loss, and increased insulin sensitivity, thereby improving blood glucose control (Malik VS et al, 2019). In addition, brown rice releases less glucose into the blood than white rice (Greenwood DC et al, 2013). Brown rice as a whole grain can also activate -glycosidase inhibitors and miglitol which are associated with decreased postprandial glucose levels, abdominal circumference, and visceral fat in subjects with the metabolic syndrome.1 This is due to the glycemic index of brown rice 55% compared to 86% white rice. This is due to the higher levels of fiber, polyphenols and phytic acid in brown rice. The glycemic index is the ability of a food to

increase blood sugar levels. A low glycemic index indicates that this food is healthier and safer for diabetics to consume by replacing the consumption of white rice with brown rice (Perkeni, 2015).

Brown rice is different from other colored rice, such as black rice or brown rice, whose name represents the original color of the rice due to its antioxidant content, such as anthocyanins. Brown rice is basically plain white rice, but only part of the rice husk or outer layer is removed and is not subjected to further polishing so that the rice bran remains intact. One hundred grams of raw brown rice contains 22.04 grams of fiber, 230 mg of magnesium, and 340 mg of potassium. The soluble fiber content of brown rice is 141% higher than white rice, while the magnesium and potassium content is 7.7 times and 5.7 times higher than white rice. (Sulistyowati et al, 2020). Oral magnesium supplementation and proper dietary patterns can improve insulin sensitivity and metabolic control in type 2 diabetes patients because magnesium is an important factor in managing blood glucose control (Kostov K, 2019)

The results of the research by Sulistyowati et al. (2019) showed that in addition to its high fiber content, brown rice also contains seven times higher magnesium and manganese minerals than white rice. Fiber and minerals are important components needed by diabetics because they are thought to help control blood glucose. The results of a preliminary study showed that the local Indonesian sintanur variety brown rice has a high fiber and mineral content (magnesium and manganese), has been shown to help reduce intestinal microbiota dysbiosis and increase serum magnesium levels in obese experimental animals, and prevent an increase in blood glucose (Sulistyowati et al. , 2019; Sulistyowati et al, 2020)

Several studies on the substitution of white rice to brown rice for various periods (six weeks to four months) demonstrated a beneficial effect on blood glucose control and anthropometric parameters in subjects with impaired glucose tolerance or type 2 diabetes. A study in Vietnam provided a brown rice diet. in women with impaired glucose tolerance showed improvements in glucose control and body weight parameters (BUI TN et al, 2014). Research conducted by Mohan (2014) showed that consumption of brown rice instead of white rice can help reduce 24-hour glucose and fasting insulin response among overweight Asian Indians. This is in line with the research conducted by Adebamowo et al (2017) that the average glucose level 2 hours after eating is lower after consuming food with a higher proportion of brown rice. Furthermore, research conducted by Kenji Matsumoto et al (2012) consuming rice for 10 weeks has the potential to prevent an increase in plasma lipids and blood glucose levels

CONCLUSION

Based on the research, it can be concluded that there is an effect of giving brown rice on blood sugar levels in postmenopausal women.

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CONFLICTS OF INTEREST

The author declares that they have no conflict of interest

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