

GIVING ALOE VERA PUDDING AGAINST BLOOD SUGAR LEVEL IN MENOPAUSE WOMEN

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ABSTRAK : PEMBERIAN PUDDING ALOE VERA TERHADAP KADAR GULA DARAH PADA WANITA MENOPAUSE

Latar Belakang: Diabetes melitus merupakan gangguan kronis metabolisme gula darah. Puskesmas Baktijaya Kota Tangerang Selatan, data menunjukkan bahwa Diabetes Mellitus menempati urutan kedua sebanyak 27,8% yang didominasi oleh wanita pascamenopause, di Puskesmas wanita menopause dengan DM belum pernah mengonsumsi lidah buaya yang digunakan sebagai terapi untuk menurunkan kadar gula darah.

Tujuan: untuk mengetahui pengaruh puding lidah buaya terhadap gula darah pada wanita pascamenopause di wilayah kerja Puskesmas Baktijaya Kota Tangerang Selatan tahun 2021.

Metodologi: Desain yang digunakan dalam penelitian ini adalah pre-post eksperimental design berupa pre-test-post-test control group design. Sampel dalam penelitian ini berjumlah 30 responden yang terdiri dari 15 responden intervensi dan 15 responden kontrol dengan teknik purposive sampling. Data dianalisis menggunakan uji-t independen. Instrumen yang digunakan adalah Tes Glukosa Darah dan lembar observasi

Hasil: Ada pengaruh penggunaan puding lidah buaya terhadap gula darah pada wanita pascamenopause dengan p value 0,033

Kesimpulan: Konsumsi lidah buaya dalam bentuk puding dapat menurunkan gula darah pada wanita menopause yang menderita diabetes mellitus. Dia

Saran diharapkan wanita pascamenopause yang menderita diabetes mellitus dapat mengonsumsi lidah buaya secara rutin dengan berbagai pengolahan salah satunya dalam bentuk puding, selain itu diharapkan penderita diabetes mellitus dapat menjaga pohonnya agar ibu tidak perlu membelinya dan hanya membuat dan mengkonsumsinya secara teratur.

Kata kunci: Gula Darah, Lidah Buaya, Menopause, Puding

ABSTRACT

Background: Diabetes mellitus is a chronic disorder of blood sugar metabolism. Baktijaya Public Health Center, South Tangerang City, data showed that Diabetes Mellitus was in second place as much as 27.8% which was dominated by postmenopausal women, at the Puskesmas menopausal women with DM had never consumed aloe vera which was used as a therapy to lower blood sugar levels.

Purpose: to determine the effect of aloe vera pudding on blood sugar in postmenopausal women in the work area of the Baktijaya Public Health Center, South Tangerang City in 2021.

Methodology: The design used in this study was a pre-post experimental design in the form of a pre-test-post-test control group design. The sample in this study amounted to 30 respondents consisting of 15 intervention respondents and 15 control respondents with purposive sampling technique. Data were analyzed using independent t-test. The instruments used are Blood Glucose Test and observation sheets

Results: There is an effect of using aloe vera pudding on blood sugar in postmenopausal women with p value 0.033

Conclusions: Consumption of aloe vera in the form of pudding can reduce blood sugar in menopausal women who suffer from diabetes mellitus. It is

Suggestions hoped that postmenopausal women who suffer from diabetes mellitus can consume aloe vera regularly with various processing, one of which is in the form of pudding, besides that it is hoped that people with diabetes mellitus can maintain the tree so that mothers do not have to buy it and just make and consume it regularly.

Keywords: Aloe Vera, Blood Sugar, Menopause, Pudding

INTRODUCTION

Sugar in the blood is called glucose which comes from two sources, namely food and which is produced by the liver. Sugar from food that enters through the mouth is digested in the intestines, then absorbed into the bloodstream. And the blood flow will carry the glucose into the muscles, tissues and cells as a source of energy. Glucose and insulin are two important things in regulating the balance of blood sugar levels throughout the body and besides that glucose is also useful as fuel in the tissues. Insulin plays a role in the process of absorption of blood glucose by cells by stimulating almost all body cells except brain cells to take glucose from the blood (Sutanto, 2013).

Aloe vera contains compounds that play an important role in reducing blood glucose levels, namely chromium, inositol (which is part of the vitamin B complex and vitamin A). As for other compounds as lowering blood glucose levels contained in aloe vera, namely monosaccharides, polysaccharides, cellulose, glucose, mannose, aldopentose, rhomansa which function to meet the body's metabolic needs, to produce mucopolysaccharides, suppress postprandial glucose and triglyceride levels and reduce the postprandial glucose ratio. In the aloe vera plant that is used as therapy is the flesh of aloe vera (Jasaputra et al., 2014)

Aloe vera contains chemicals that have hypoglycemic properties including chromium and alprogen. It is assumed that the administration of Aloe vera can protect and restore the function of damaged pancreatic cells. Then the content of Aloe vera can work like insulin and reduce blood glucose levels even though all pancreatic cells have degenerated (Wuliyani, 2007). Other studies also mention that acemannan, anthraquinone and phytosterols in Aloe vera are thought to have antidiabetic effects (Agatha & Aveonita, 2015)

Aloe Vera contains chromium which when consumed by people with diabetes mellitus will go to adipose tissue and striated muscle which will activate the phosphorylation of Akt in adipose tissue and striated muscle. Akt phosphorylation will stimulate insulin secretion patently so that glucose can enter pancreatic cells by passive diffusion mediated by specific membrane proteins (glucose transporter 2) while glucose enters the plasma membrane through glucose transporter 4 which can also stimulate insulin secretion. Due to insulin secretion, insulin production increases automatically glucose production by the liver decreases and blood glucose also decreases. The larger the dose, the more chromium content, so it will be more efficient at lowering blood glucose levels. (Wuliyani, 2007)

Based on the above background, the authors are interested in discussing the effect of aloe vera (Aloe vera) to lower blood glucose levels in postmenopausal women

RESEARCH METHODS

The design of this study was a quasi-experimental design with a control group pre-test-post-test design. The population in this study were all menopausal women who experienced diabetes mellitus in the Work Area of the Baktijaya Public Health Center, South Tangerang City for the period January-March 2022 as many as 117 people. The sampling in this study used purposive sampling. The inclusion criteria were, The results of measuring blood sugar levels when at the Puskesmas 200 mg/dl, currently not taking chemical drugs, the patient does not smoke, the patient is classified as Diabetes Mellitus type II without complications of hypertension, and is willing to be a respondent. Meanwhile, the exclusion criteria were that the patient was being treated in a hospital and had memory problems.

The location of the study was carried out in the Work Area of the Baktijaya Health Center, South Tangerang City with the consideration of finding postmenopausal women with diabetes mellitus. The time of the study was carried out in April-June 2022.

Data were obtained through the tools used to identify blood sugar using the Blood Glucose Test and observation sheets where in filling using the checklist method in order to provide direct results. Measuring instruments or data collection tools in the pretest are usually used again in the posttest. The researcher divided the respondents in the study into 2 intervention groups (giving aloe vera) and the control group, the researcher made a voice call to the respondents who would be used as research samples and the researcher would directly monitor the process of consuming aloe vera pudding in the group that was given the intervention. The process of pretest and posttest along with the provision of pudding packages was carried out at the Puskesmas and the data were analyzed using univariate, bivariate

RESEARCH RESULT

Univariate Analysis

Based on table 1, it can be seen that the average progress of menopausal women's blood sugar levels in the intervention group (giving aloe vera pudding) obtained an average value = 154.40, the standard deviation obtained a value of 57.551 with a minimum value of 95 and a maximum value of 297.

Table 1
Average Blood Sugar Levels of Menopausal Women Before and After in the Intervention Group

Provision of Aloe Vera Pudding	Mean	Std. Deviasi	Min	Max
Before	228,87	85,746	109	479
After	154,40	57,551	95	297

Table 2
Average Blood Sugar Levels of Menopausal Women Before and After in the Control Group

Blood Sugar Level	Mean	Std. Deviasi	Min	Max
Before	194,60	17,675	168	225
After	190,40	16,256	165	220

Based on table 2, it can be seen that blood sugar levels at the initial examination obtained an average value = 194.60, the standard deviation obtained a value of 17.675 with a minimum value of 168 and a maximum value of 225. The final examination obtained an average value of 190.40, the standard deviation was obtained a value of 16,256 with a minimum value of 165 and a maximum value of 220.

Bivariate Analysis

Based on the results of different tests in the intervention group using the Wilcoxon test, it has a p value of 0.001 (<0.05), meaning that there is a change in blood sugar levels in postmenopausal women in the intervention group before and after being given aloe vera pudding.

Table 3
Differences in Blood Sugar Levels in Menopausal Women Before and after in the intervention and control groups

Blood Sugar Level	Pretest Mean	Posttest Mean	Mean Difference	P Value
Intervention Group	228,87	154,40	74,47	0,001
Control Group	194,60	190,40	4,2	0,001

Table 4
Effect of Aloe Vera Pudding on Blood Sugar in Menopausal Women

Blood Sugar Level	Intervention Mean	Kontrol Mean	Mean Difference	P Value
Pretest	228,87	194,60	33,4	0,110
Posttest	154,40	190,40	-36	0,033

Based on table 4, that there are differences in blood sugar levels after being given treatment in the intervention group and the control group in postmenopausal women

DISCUSSION

Fresh aloe vera leaf decoction (Aloe vera L) with a concentration of 400% w/v alone can significantly reduce blood glucose levels ($P0.05$) even though the PKGD is still below glibenclamide. Aloe vera leaves can reduce blood glucose levels in rabbits that are burdened with glucose, this is

because aloe vera leaves contain several active compounds that may have a hypoglycemic effect, namely chromium, inositol (Sujono & Wahyuni, 2005)

Administration of aloe vera ethanol extract to rats caused a significant reduction in plasma glucose levels. On the other hand, when the same dose was administered to normal rats, there was no significant reduction in plasma glucose levels. These findings suggest that the hypoglycemic effect of Aloe vera extract can induce hyperglycemic rats (Abuelgasim et al., 2008).

Aloe vera can be a useful hypoglycemic pharmaceutical agent for controlling blood glucose levels in diabetic patients. However, further studies are needed to confirm the exact mechanism of the aloe vera extract pathway to lower blood sugar levels. (Jafri et al., 2011)

Aloe vera extract is also effective in reducing hyperglycemia in alloxan-induced rats it is also mentioned that aloe vera extract can reduce cholesterol, triglyceride and fat levels. more about the clinical use of aloe vera extract as an antidiabetic to treat T2DM. (Christijanti et al., 2019)

Aloe vera peel extract given for 28 days had an effect on reducing blood sugar levels in hyperglycemic rats. Various doses are needed in order to obtain an optimal dose of aloe vera bark extract which is useful as a therapeutic drug to reduce blood sugar levels and improve pancreatic histology of hyperglycemic rats (Peniati et al., 2018)

Therefore, it is concluded that besides insulin, Aloe vera gel can also be a better choice in controlling blood sugar levels (Qadeer et al., 2019)

There was a significant difference in blood sugar levels between before and after administration of aloe vera juice. giving aloe vera juice that is done correctly and regularly is beneficial for reducing blood sugar levels in people with Diabetes Mellitus. (El Qahar, 2020)

Aloe vera contains chemicals that have hypoglycemic properties, such as chromium and anthraquinones. Giving half a teaspoon of aloe vera extract to five diabetic adults daily for 14 weeks reduced the sugar levels of patients with non-insulin dependent diabetes (type II diabetes) by 45% with no change in body weight. (Agatha & Aveonita, 2015)

The presentation of aloe vera in the form of juice can attract attention, besides that it tastes better and is preferred by all people, aloe vera leaves have the same nutritional content as other green vegetables. Chemically, aloe vera consists of 90% water, 4% carbohydrates and the rest consists of minerals and 17 kinds of amino acids (Kurnianingsih, 2004). Aloe vera plant is known to have many benefits and properties, such as anti-inflammatory, anti-fungal, antibacterial, and cell regeneration. In addition, it functions to lower blood sugar levels for diabetics, control blood pressure, and stimulate immunity against cancer. (Marhaeni, 2020)

The administration of aloe vera ethanol extract at a dose of 250mg/kgBW can affect the decrease in blood glucose levels in hyperglycemic rats. (Arif et al., 2022)

A decrease in blood sugar levels is caused by the presence of chemicals that can reduce blood sugar levels in people with diabetes mellitus such as chromium which serves to help the work of the insulin hormone by helping receptor cells to bind to insulin, aloe emodin or inositol which serves to increase blood sugar levels. the rate of glycogen synthesis by inhibiting glycogen synthase kinase-3 beta to lower sugar levels. Other compounds are monosaccharides, polysaccharides, cellulose, glucose, mannose, aldopentose, rhomansa which function to meet the body's metabolic needs and suppress sugar levels in the body. (Septianingtyas & Agustini, 2021)

The regulation of insulin secretion is influenced by the feedback effect of blood glucose levels on the pancreas. When glucose levels rise above 100 mg/ml blood insulin secretion increases rapidly. When glucose levels are normal or low, insulin production will decrease (Asna, 2019).

Aloe vera extract can be a useful and safe agent in reducing alloxan-induced hyperglycemia. More detailed studies on A. vera using different doses and long observation periods are needed before reaching a clear conclusion about the future of A. vera for the treatment of diabetes mellitus (Joyamma, 2017).

Blood sugar levels in elderly people with diabetes mellitus have decreased, but only slightly. The decrease was caused by the mother's diet and physical activity. In accordance with the results of observations made in the control group which stated that so far, mothers have been diligent in walking although not routinely and reducing foods containing high sugar content, they try to consume sweet foods using synthetic sugar and eat only 2-3 times. times a day. They said that so far they have followed the Prolanis (Chronic Disease Management Program) held by the Puskesmas, one of which is diabetes mellitus. Based on this statement, it can be seen that elderly mothers who have diabetes mellitus already know about efforts to reduce blood sugar levels naturally through a healthy lifestyle. (Wicaksana, 2016)

The process of decreasing blood sugar levels is slightly caused by the mother's age, this is because at that age there is an increase in glucose intolerance, besides that the level of estrogen in a woman's body will decrease. Estrogen functions to provide a protective effect on pancreatic cells and prevent premature cell death, while these pancreatic cells can function to increase insulin production when needed by certain conditions, such as diabetes. The decrease in estrogen causes pancreatic cells to become resistant to insulin,

thereby worsening blood glucose levels circulating in the body. Insulin resistance causes cells to have no difficulty absorbing glucose from the bloodstream so that glucose levels in the blood become higher. Other factors are caused by irregular exercise so that the process of reducing blood sugar levels is not optimal, if exercise is carried out regularly by the elderly it can make insulin increase so that blood sugar levels will decrease (Sari, A. Wardy, A. Sofiani), 2019)

Giving aloe vera can protect and restore the function of pancreatic cells that have been damaged, then the content of aloe vera can work like insulin and lower blood glucose levels even though all pancreatic cells have degenerated. Aloe vera contains chemicals that have hypoglycemic properties including chromium and alprogen. chromium which plays a role in stimulating insulin secretion by pancreatic beta cells. (Agatha & Aveonita, 2015)

Chromium can help insulin work by helping receptor cells to bind to insulin. Chromium consumed will go to fat tissue and striated muscle which will activate phosphorylation in fat tissue and striated muscle. The amount of amino acids, vitamins, enzymes, anthraquinones and other elements are not present in large quantities, but because they are combined into one they produce amazing results. (Agatha & Aveonita, 2015)

The average decrease in fasting blood glucose after administration of aloe vera juice was 28.42 g/dl and blood glucose while 40.54. Bivariate analysis showed that there were differences between aloe vera juice and fasting blood glucose ($0.00 < 0.05$) and 2 hours pp ($0.03 < 0.05$), so it could be concluded that there were differences between aloe vera juice and fasting blood glucose. Herbal plants such as aloe vera are very good for reducing blood sugar levels. Aloe vera does not contain synthetic drugs, there are no side effects that can harm the body. The price is relatively cheap and can be reached by the community and the taste is not bitter. (Indahningrum et al., 2020)

Aloe vera pudding has an effect on reducing blood sugar levels where aloe vera contains ingredients that can stabilize blood sugar levels, namely chromium and aloe emodin. Chromium and aloe emodin are needed by the body in the metabolism of carbohydrates and fats. Together with insulin, chromium functions to facilitate the entry of glucose into the body, spreading glucose into the bloodstream into the cells so that it will increase the number of insulin receptors on cell membranes which can later facilitate the binding of insulin to cells. These substances can reduce the

ratio of sugar content in the blood (Alinejad-Mofrad et al., 2015).

There are several nutritional approaches to address the increasing need to manage diabetes. It was previously reported that UP780, a standard composition of aloe vera formulated with aloe polysaccharides, had a significant effect in reducing HbA1C, fasting blood glucose, fructosamine and plasma insulin levels in humans and improving glucose disturbances and insulin resistance in high-fat dieters. composition based on chromone standard Aloe, may be used as an alternative to natural supplements to facilitate the maintenance of healthy blood glucose levels. (Marhaeni, 2020)

It can be concluded that the leaf extract of A. Vera has antidiabetic action thus validating the reason for its use in native medicine. Further studies are needed to identify possible mechanisms of action to establish the hypoglycemic effect. (Manjunath et al., 2016)

It is recommended that herbal therapy to reduce blood sugar levels, one of which is by using aloe vera, in addition to having few side effects, it is also easy to obtain and can be consumed in various ways, one of which is made into pudding so that it attracts attention. Besides that, it is hoped that the mothers have the tree, because based on the observations from 15 respondents who were used as the intervention group, only 3 mothers had the tree.

CONCLUSION

That there is a difference in blood sugar levels after being given treatment in the intervention group and the control group in postmenopausal women in the working area of the Baktijaya Public Health Center, South Tangerang City in 2021.

SUGGESTION

It is expected that elderly people with diabetes mellitus, especially postmenopausal women, can combine treatment with herbal ingredients, one of which is by consuming aloe vera regularly with various processing can be in the form of pudding because the ingredients are cheap and easy to make and families can use land/pots to plant aloe vera as family medicinal plant.

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