Literatur Review

Effect Of Ethanol Extract Jackfruit (Artocarpus Heterophyllus Lam.)To Decrease Blood Sugar Levels In Wistar Female White Rats With

Basaria Manurung[1], Putri C Eyanoer[2], Tengku Muhammad Fauzi[3,4]

1. Student of Masters Program in Biomedical Sciences, Faculty of Medicine, Universitas Methodist Indonesia, Medan, Indonesia
2. Department of Public Health, Faculty of Medicine, Universitas Sumatera Utara, Medan
3. Department of Histology, Faculty of Medicine, Universitas Methodist Indonesia, Medan
4. Biomedical Laboratory of Masters Program in Biomedical Sciences, Faculty of Medicine, Universitas Methodist Indonesia, Medan

* Correspondence:
zifirstfauzi@gmail.com

Abstract

Background: Hormonal and metabolic changes during pregnancy cause the pregnancy to be diabetogenic, in which GDM tends to become heavier during pregnancy and will facilitate the occurrence of various complications. DMG mothers approximately 1.7% can cause perinatal mortality, 4.3% give birth to children by surgery, 7.3% give birth to children whose birth weight is more than 4.5 kg and 23.5% can cause cases of dystocia. shoulder during labor.

Methods: The study was conducted using a literature review method that focuses on the results of writing related to the effects of the Jackfruit Seed (Artocarpus heterophyllus Lam.) ethanol extract on female Wistar rats with gestational diabetes mellitus induced by Streptozotocin by browsing accredited journal sites such as Google Schoolar, Google, and Pubmed, in the period 2016-2021.

Conclusion: Based on the research conducted, there was an effect of giving ethanol extract of jackfruit seeds (Artocarpus heterophyllus Lam.) to decrease blood sugar levels in female wistar rats with gestational diabetes mellitus induced by streptozotocin

Keywords: Gestational Diabetes Mellitus, Jackfruit Seed Ethanol Extract

INTRODUCTION

According to the World Health Organization (WHO), diabetes mellitus is a chronic metabolic disorder characterized by high blood sugar levels accompanied by impaired carbohydrate, lipid, and protein metabolism as a result of insulin function insufficiency, which can be caused by impaired insulin production by beta cells. Langerhans of the pancreas gland or caused by a lack of responsiveness of the body's cells to insulin.[1]

Diabetes mellitus is one of the causes of high morbidity and mortality, especially in pregnant women, mainly due to vascular complications. It could occur due to the increased formation of free radicals through glucose metabolism as glucose autooxidation, metabolism of methylglyoxal formation, and oxidative phosphorylation. One type of free radical that is highly reactive is the hydroxyl radical which is very toxic because of its ability to diffuse to the next transfer and react with membrane lipids to produce malondialdehyde (MDA) products.[2]

Gestational Diabetes Mellitus(DMG) is a disorder of carbohydrate tolerance that results in increased blood sugar levels and was first recognized during the second and third trimesters of pregnancy.[3]but often difficult to find because of the low ability to detect cases. GDM is rarely known because it is rare for pregnant women to screen if there are no complaints or indications even though there is a family history.[4]

Gestational Diabetes Mellitus (DMG) in the Sustainable Development Goals (SDGs) is one of the points in its aims to improve maternal health. Screening of pregnant women from an early age can be one way to improve maternal health, especially in pregnancy, which sometimes only focuses on certain diseases such as hypertension and anemia, while gestational diabetes receives less attention except for pregnant women who are already suffering from the disease. DM long before pregnancy. The American Diabetes Association (ADA) is one of its work programs, it is hoped that every health service place can carry out antenatal screening as early as possible to prevent complications that may occur during the delivery process later.[5]

In Indonesia, the prevalence of GDM is 1.9-3.6% in general pregnancy, while the prevalence in pregnant women with a family history of DM is 1.5%, of all pregnancies, it ranges from 1-14% to those with GDM, and those who are undiagnosed, ranging from

10-25. %. Approximately 135,000 pregnant women who experience DMG each year are 3-5%.[6]

Many people don't know about traditional alternative medicine using natural ingredients, even though there are about 30,000 types of traditional medicinal plants, only about 1,200 plants have been studied as traditional medicinal plants. In addition, traditional medicines have not been recognized in modern medical practices because few have undergone preclinical trials and clinical trials. This is very unfortunate because the actual potential of Indonesian traditional medicinal plants is very large. In addition, traditional medicinal plants also have the advantage that they are easy to obtain and economical, making it very easy for people to get them.[7]

Natural ingredients that can be used as an alternative treatment for diabetes are jackfruit seeds (Artocarpus heterophyllus Lam.). Jackfruit seeds contain compounds such as flavonoids, saponins, alkaloids, terpenoids, and steroids. Flavonoids can increase the work system of antioxidant enzymes that can neutralize free radicals and can lower blood sugar levels and overcome fatigue caused by an unbalanced increase in blood sugar levels. With its ability as an antioxidant and protective against damage to pancreatic cells as insulin producers and can increase insulin sensitivity. Jackfruit (Artocarpus heterophyllus Lam.) is an efficacious plant and has been widely used by the community to treat various diseases from generation to generation. Jackfruit bark has antibacterial activity.[8]

INTRODUCTION

This research is research using the literature study method or literature review. A literature review is a comprehensive overview of the research that has been done on a specific topic to show the reader what is already known about the topic and what is not known, to seek rationale from research that has been done, or for further research ideas.

The data used in this study comes from the results of research that has been carried out and published in national and international online journals. In conducting this research, the researchers searched for research journals published on the internet using the Google Schoolar and PubMed search engines.

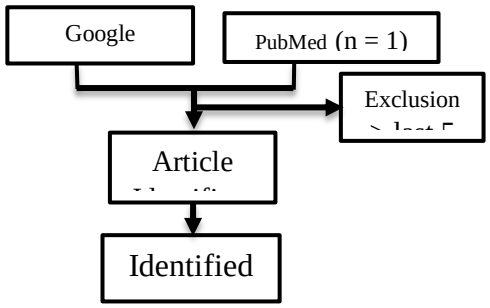

Figure 1. Journal Search Algorithm

RESULT

Based on the literature search, it was obtained as many as 1 study related to the effect of jackfruit seeds on reducing blood sugar levels in experimental animals with Gestational Diabetes Mellitus.

Research conducted by. Dwitiyanti, A. Rachmania, K. Efendi, T. Tri Atmojo, and Y. Yeni, (2019) about *In Vivo*Activities and In Silico Study of Jackfruit Seeds (Artocarpus heterophyllus Lam.) on the Reduction of Blood Sugar Levels of Gestational Diabetes Rate Induced by Streptozotocin,research results showthat all groups of 70% ethanol extract of jackfruit seeds can lower blood glucose levels. The greatest decrease in blood glucose levels occurred at dose 3 with a dose of 400 mg/kg BW, which was 61.73%, comparable to the positive control of glibenclamide. The results of virtual screening with molecular docking showed that beta-carotene epoxide had a better affinity than glibenclamide as a comparison compound. [8]

CONCLUSION

Following the background of the problem and the purpose of the literature review from several journals, it can be concluded that there are a significant relationship between ethanol Extract Jackfruit Seeds (Artocarpus heterophyllus Lam.)To Reduce Blood Sugar Levels in Female Wistar Rats with Gestational Diabetes MellitusStreptozotocin-induced.

CONFLICT OF INTEREST

There was no conflict of interest.

FUNDING AND SPONSORSHIP

This study used personal funds from the main researcher.

ACKNOWLEDGEMENT

The researchers would like to thank all of the participants who have helped us in the preparation of this article and thanks to the database providers, PubMed, ScienceDirect, and Google Scholar

REFERENCES

[1] Ministry of Health of the Republic of Indonesia, "The need for early detection to prevent and reduce the risk of diabetes," The need for early detection to prevent and reduce the risk of diabetes, 2016, [Online]. Available: www.depkes.go.id.

[2] J. Tandi, JA Claresta, G. Ayu, and I. Irwan, "Effect of ethanol extract of Kenikir (Cosmos cau-

datus Kunth.) leaves in blood glucose, cholesterol and histo-pathology pancreas of male white rats (Rattus norvegicus),” Indonesia. J. Pharm. science. Technol., 2018.

[3] S. Candra, K. DK, And Y. Widodo, "Influence Of Alloxan-Induced Alloxan-Induced Blood Glucose Levels Of Wistar Rat (Averrhoa blimbi L.) J. Doctor. Diponegoro, vol. 1, no. 1, p. 105365, 2012.

[4] S. Hardyanti, "Occurrence of Gestational Diabetes Mellitus (DMG) in Sleman Regency, Yogyakarta City," 2019, [Online]. Available: http://digilib2.unisayogya.ac.id/bit-stream/handle/123456789/804/SITI ARDYANTI_1810104215_naspub.pdf?sequence=1&isAllowed=y.

[5] Sulistiyah, "Supporting Factors of Gestational Diabetes Mellitus Risk in Pregnant Women at BPS Malang Regency," Polytechnic. RS dr. Soepraoen, 2015.

[6] F. Rahmawati, J. Natosba, and J. Jaji, "Gestational Diabetes Mellitus Screening and Risk Factors Affecting It," J. Sriwij Nursing., 2016.

[7] VA Rahayu, "Antidiabetic activity test of kenikir (cosmos caudatus h. BK) leaf ethanol extract against alloxan-induced male wistar rats," 2018, [Online]. Available: http://repository.unsri.ac.id/837/1/RAMA_48201_08061381419073_0003077102_0008038802_01_front_ref.pdf (accessed Sep.17,2020).

[8] D. Dwitiyanti, A. Rachmania, K. Efendi, T. Tri Atmojo, and Y. Yeni, “Potential Of Jackfruit (Artocarpus heterophyllus L.) Fruit Installing Alfa-Glucosidase Receptors In Vi-zotogestational Induced Seeds Of Diabetes Mellitus Rats and In Silico," Pros. Kolok. Dr. and Semin. Has. researcher. Grant, 2019, doi:10.22236/psd/11118-13065.

[9] Gissen Aj. Covino BG, Gregus J. Differential sensitivities of mammalian nerve fibers to local anesthetic agents. Anesthesiology 1980;53:467-74.

[10] Johnson MD, Burger GA, Mushlin PS, et al. Reversal of bupivacaine epidural anesthesia by intermittent epidural injections of crystalloid solutions. Anesth Analg 1990;70:395-9.

[11] Sitzman BT, DiFazio CA, Playfair PA, et al. Reversal of lidocaine with epinephrine

epidural anesthesia using epidural saline washout. Reg Anesth 2001;26(3):246-251.

[12] Katircioglu K, Ozkalkanli MY, et al. Reversal of prilocaine epidural anesthesia using epidural saline or Ringer's Lactate washout. Reg Anesth 2007;32(5):389-392.

[13] Brock-Utne JG, Macario A, et al. Postoperative epidural injection of saline can shorten postanesthesia care unit time for knee arthroscopy patients. Reg Anesth 1998;23(3):247-251.

[14] Cousins M, et al. Epidural Neural Blockade. Neuronal blockade. 3rd ed. New York: JB Lippincott, 1998:244-291.

[15] Chan V, Nazarnia S, et al. The impact of saline flush of the epidural catheter on resolution of epidural anesthesia in volunteers: A dose-response study. Anesth Analg 1999;89:1006-10.

[16] Gissen D, Leith DE. Transient decreases in respiratory rate following epidural injections. Anesthesiology 1985;62:822-4.

[17] Higuchi H, Adachi Y. Kazama T. Effects of epidural saline injection on cerebrospinal fluid volume and velocity waveform. A magnetic resonance imaging study. Anesthesiology 2005;102:285-92.

[18] Naseri A, ZBlumenkranza M, Horton J. Terson's syndrome following epidural saline injection. Neurology 2001;57:364-365.

[19] Rodriguez J, Rodriguez V, et al. Epidural washout with high volumes of saline to accelerate recovery from epidural anesthesia. Acta Anaesthesiol Scand 2001;45:893-898.