SYSTEMATIC REVIEW EFFECTIVITY OF BANANA (MUSA) AS ANTI-DIABETIC AGENT ON MICE

Diana Hardiyanti, Diana Pefbrianti, Happy Restu Pratiwi  
Faculty of Nursing, Universitas Airlangga  
Email: diana.hardiyanti-2016@fkp.unair.ac.id

ABSTRACT

Introduction: Diabetes Mellitus (DM) is one of degenerative diseases which the number keeps increasing and can be found around the world. In Indonesia, Riskesdas data shows that there were an increase of Diabetes prevalence in Indonesia from 5.7% in 2007 to 6.9% or around 9.1 million in 2013. The management of diabetes can be done pharmacologically or non-pharmacologically. Banana (Musa) is one of abundant plants that can be easily found, especially in Asia. Banana is believed to gave antidiabetic property. The aim of this research was to understand the effect of banana in treating hyperglycemia. Methods: The research journals reviewed in this systematic review were research from 2013 to 2016. Most of the research is performed on animals. Journal search using search engine, such as ProQuest, GOOGLE SCHOLAR, SCIENCE DIRECT. Results: All research journals found that banana can be used as antidiabetic Conclusion: Generally, banana (Musa) is effective to be antidiabetic agent on diabetic test animals. Yet, further research is needed for the effectivity of banana’s antidiabetic agent on human, and homogeneity of the research types and research materials.

Keywords: Musa, Diabetes Mellitus, Antidiabetic, Mice

INTRODUCTION

Diabetes Mellitus (DM) is one of the degenerative diseases, which its number develops continually, and it can be found in the entire world. Genetic factor, lifestyle, exercise, and diet pattern are complex etiology of DM (Brito et al., 2009).

Diabetes is disease caused by high level of blood glucose as the result of pancreas and insulin disturbance. Symptoms occurring in DM sufferer are polydipsia, polyuria, polyphagia, body weight reduction, as well as pins and needles (Hakim, 2010).

In Indonesia, The Riskesdas data show Diabetes prevalence increased from 5.7% in 2007 to 6.9% (around 9.1 million) in 2013. The data of International Diabetes Federation in 2015 explained the estimation number of Diabetes sufferer in Indonesia was predicted in the number of 10 million. Like the world condition, Diabetes, nowadays, becomes one of the biggest dead cause in Indonesia. The data of Sample Registration Survey in 2014 show that in Indonesia Diabetes was the third number of the biggest dead cause with presentage of 6.7%, after Stroke (21.1%) and Coronary Heart Disease (12.9%). Even if it is not handled, this condition will be able to lead the derivation of productivity, disability, and early dying.

Diabetes management can be done with pharmacological or non-pharmacological method (Indrawati et al., 2015). The experts of The World Health Organization (WHO) explained that plant can be antihyperglycemic source (WHO, 1980).

Banana is the plant that grows in many numbers and can be found easily, particularly in Asia. Banana has many kinds, which one of its kinds is ambon banana (Musa paradisiaca L.) which has savor for antidiabetic (Iman & Akter, 2011).
METHODS
In this systematic review the research which was reviewed was counted since 2013-2016. The majority of the researchs were conducted in animal.

This study sample used animal. The chosen animal was the house mouse (Mus musculus) or Mencit in Indonesian term with the age of 2-3 months (Indrawati et al., 2015), white male rat (Rattus norvegicus) Sprague-Dawley which was from seven-to-eight-month-old (Redya et al., 2016). The research which used experimental animals gained approval from ethic committee previously.

The experimental animals being used were chosen randomly, and they were taken care in the animal laboratorium with room temperature less than 240, lighting (12 h day/night cycle) adapted for 7 days (Redya et al., 2016): moreover, they were given normal pallet diet (NPD). They were divided into some groups—experiment group and control group. The experimental animals were induced by serum caused diabetic animal, as induction of streptozotocin (STZ) and saline glucose, in one night, before the animals were fasted.

Banana was extracted with many methods, and it was treated to be oral medicine for experimental animals. Banana which was used in this study was ambon banana (Musa paradisiaca L) (Kappel et al., 2013), Amala banana and crude Booli banana (Shodehinde et al., 2015).

RESULT
All of gained journals described antidiabetic effectivity of banana to reduce blood glucose level in experimental animals, which were two journals from Indonesia, one journal from Nigeria, and two journals from India. The aim of this research is to know the effect of using banana for treating hyperglicemic.

The number of experimental animals in this research started from 20 to 45 samples, with age from two-to-three-month-old. The giving of banana extract was done after experimental animals were fasted, and they got serum for impeding the pancreas in producing insulin.

Research by Kapel, et al (2013) found that there is a decrease on serum glucose level, insulin secretion stimulation and obstructing the enzyme activity related to the glucose absorption and the formation of AGE on groups of mice that are given banana extract. Shodenhinde, et al (2015) found that fasting blood glucose of the mice group that only given NPD is higher than other groups, the mice groups that eceived diabetic medicine Acarbose and mice groups receiving Booli banana diet and raw amala diet has significant decrease on blood glucose level. Research by Redya, et al (2016) shows after 4 weeks treatment using banana extract, significantly the serum glucose level from diabetes (T2DM) decreased. Kaempe, et al (2013) shows that mice inducted with alloxan, receiving fenolic extract from goroho banana did not show significant increase on blood sugar level, mice blood sugar level decrease mostly on the administration of fresh banana extract for 67,6 mg/dl (61, 19%). All research journals found that banana can be used as antidiabetic agent.

DISCUSSION
Generally, these research journals found that bananas are effective for antidiabetic agent. These research include Ambon, goroho, booli and amala bananas. All treatments given orally, both directly and extracted. The experiments were performed in laboratories on test animals induced with diabetes. The results measured from the journals including the effectivity of antidiabetic agent in bananas on test animals, the comparison of blood sugar level decrease with the administration of glibenclamyde, bananas extract and acarbose, length of time used for the decrease of blood sugar level.

Ambon bananas have been used in several research, through direct as well as extracted administration, raw bananas, as well as processed banana peels, this
research is still limited to test animals (Iman & Akter, 2011). Bananas have the effect on blood sugar level decrease.

CONCLUSION AND RECOMMENDATION

Generally, banana (Musa) is effective for antidiabetic agent on test animal with diabetes. Yet, further research is required for the effectiveness of banana’s antidiabetic properties on human, and homogeneity of research type and materials.

REFERENCE


