Dosage antioxidant drink sinom of β cell langerhans islet white mice spraque dawley diabetes mellitus

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Abstract. Drink sinom is beverage was from rhizomes turmeric and leaves acid young as an alternative treatment diabetics mellitus, because it contains compound antioxidant. Research aims to understand percentage of regeneration cells β the island of langerhans the pancreas mice sprague dawley (SD) diabetes mellitus therapy antioxidant doses faction drink sinom water. Research experimental this is a bioassay with Treatment the various doses of water drink sinom: (1) 0 mg / kg BW, (2) 50 mg / kg BW, (3) 100 mg / kg BW, (4) 150 mg / kg BW mice, (5) 200 mg / kg BW. Making mice diabetes done by means of induction streptozocin in intraperitoneal dose of 50 mg / kg BW mice, an analysis of data using random design complete (RAL). Faction doses water significantly influence (p<0,05) on the percentage of cells β per roomy of view island of Langerhans tissue the pancreas mice DM. The results of comparative test double BNT show that cells β various dosages water faction beverages sinom different real. The immunohistochemistry shows that a dose of water drink sinom 50 mg / kg BW mice able to improve percentage of regeneration cells β highest 45,45 % approaching condition of the cell β mice control (60,75 %). The research results show that doses lowest faction water drink sinom has improved regeneration cells β significantly to percentage of cells β the island of Langerhans tissue of the pancreas mice sprague dawley diabetes mellitus.

1. Introduction

Sinom drink is a beverage that is processed with the main ingredients of turmeric rhizome and young tamarind leaves taken from leaf top until strand 7 [1]. Naturally drink sinom have biology activities as antioxidants, antiflammatory, antipyretic and tranquilizers [2]. Testing of antioxidant activity in vitro drink sinom already done to determine the ability of antioxidant activity on the inhibitory power of fat oxidation process. The antioxidant capacity of the water fraction that can regenerate the island’s β cells Langerhans pancreatic tissue in diabetic mellitus mice has never been tested.

Free radicals can trigger the occurrence of β cell damage on the island Langerhans. Exogenous free radicals can be derived from the induction of streptozotocin (STZ) as a spontaneous diabetogenic. Insulin is a compound that can indicate a blood glucose diabetes mellitus [3]. Diabetes mellitus is a disease characterized by chronic hyperglycemia and metabolic disorders, especially carbohydrates in the body. This hyperglycemia usually occurs when the β cells in the Langerhans island are unable to produce insulin or have insulin deficiency resulting in decreased glucose intake into the cell and increased release of glucose from the liver into the circulation. This hyperglycemia causes diabeticts to suffer from insulin dependence. Condition like this can be stated diabetics suffer from type I diabetes disease.
Current diabetes mellitus treatments use drugs that are relatively expensive and may cause undesirable side effects. Nearly 88% diabetics reported using antidiabetic drugs in its therapy, in decades, worldwide there is a tendency to increase the use of functional food preparations for various health maintenance needs although the effectiveness of its use still needs to be proven [4]. Therefore need to look for an effective drug, side effects are relatively small with a cheap price. One of the beverage products that is suspected to be an alternative to the effect of antidiabetic are drink sinom containing antioxidant compounds. Prevention of diabetes mellitus by using bioactive component that acts as an antioxidant through the fraction of water drink sinom already formulated to ward off free radicals. Giving extract of methanol with mahoni seed dosage over 100 mg/kg body weight of mouse did not give better result to regeneration effect of β cell of diabetic mouse after induction STZ dose 50 mg/kg BW [5]. The ability of tumeric rhizome and tamarind leaf as a drink sinom on the determination of doses of 100 mg/kg BW mice diabetes mellitus showed the existence of synergism that can increase SOD activity and decrease fasting blood glucose 109 mg/dl mice hiperglikemik [1].

The body under normal circumstances, maintaining blood glucose levels between 70-110 mg / dL. While hyperglycemia conditions fasting blood glucose levels above normal [6]. The aim of this study was to determine the dose of antioxidant sinom that can increase the percentage β cell Langerhans island of pancreatic tissue of white spraque dawley mice of diabetes mellitus.

2. Research Methods
This research has got Ethical Clearance of Udayana University Medical Faculty / Sanglah Hospital Denpasar, Bali with Number: 289 / UN. 14. 2 / R & D / 2014. This research was done by determining the dose of antioxidant fraction of water of drink sinom, then conducted immunohistochemical tissue test to know regeneration of β cells of Langerhans Island pancreas tissue of white mice Sprague Dawley diabetes mellitus, from December to March 2014 in Anatomy Pathology Laboratory and Histology Faculty of Veterinary Medicine of Udayana University. Dosage treatment used Randomized Complete Design conducted in bioassay using 20 white mice Sprague Dawley with dosage treatment of water fraction of drink sinom research phase I consist of 5 level that is: given orally (sonde) of : 0 mg / kg BW or given aquades of 5 ml, referred to as negative control (K0), (K1), (K2), (K3), (K4) are 50,100,150,200 mg / kg BW/head/day fraction of water drink sinom that has added 5 ml aquades given 2 times a day morning and day time. Each group had 5 groups and 4 mouse as replicates. 08.00 am and noon at 12:00 to 13:00 pm.

3. Results
Data on average calculation of percentage of β cells Langerhans island white mice pancreas Sprague Dawley diabetes mellitus treatment of various dosage fractions water of drink sinom are depicted in Table 1 below. The result of analysis glucose blood after fast comparison test of control mice which stated that the percentage of healthy mouse β cells is 60,75-80% to meet around Langerhans pulsed pancreatic tissue [7].

| Treatment of water fraction dose | Percentage β Cell Langerhans Island (%) |
|---------------------------------|----------------------------------------|
| Control                         | 60.75a                                 |
| D-50                            | 45.45b                                 |
| D-100                           | 30.25c                                 |
| D-150                           | 28c                                    |
| D-200                           | 15.25d                                 |

Table 1. Average calculation of Percentage of Langerhans Island β cell White Mouse Penkreas Sprague Dawley Diabetes Mellitus Treatment of various Dosage fractions Water of drink Sinom
4. Discussion
The effect of β cell damage on the treatment of fraction of water dosage of drink *sinom* with the highest β cell number of diabetic mice is by giving dose 50 mg / kg BW β 45,45% cell mice close to control mice cell that is 60,75% [7].

This is due to the regeneration of β cells, this means that the fraction water of drink *sinom* can improve the β cells of pancreas tissue damaged by STZ induction, thought to be caused by the various antioxidant content present in the fraction of the water of drink *sinom* can work very effectively in inducing nitrosourea induced by STZ [8]. Phenol compounds from ascorbic acid, vitamin B is very effective to clean up ROS, thus β cell condition is protected from damage so that insulin secretion goes normal. The fatty acids contained in detectable drink *sinom* (9-Octadecenoid acid) are not readily oxidized in the early stages of fatty acid transport in the mitochondria.

This is due to the presence of antioxidant water fraction of synergic drinks that synergize free radical from nitrosourea in the tissue caused by STZ induction, resulting in the regeneration of β cells, thus the secretion of insulin occurs. This is supported by research of addition of dose of methanol extract of mahogany seeds research which has been done [9]. The lowest dose fraction water of drink *sinom* can experience the highest decrease of fasting blood glucose level of white mice *Sprague dawley* diabetes mellitus. Reduced blood glucose levels occur due to the decrease in the damage of pancreatic tissue, it is also possible that the increase of maximum β cell percentage as a sign of improvement of β cells for the increase of insulin secretion, consequently glucose in blood can be absorbed into cells and can be changed into energy or stored in glycogen form.

5. Conclusions
The antioxidant capacity of the water fraction has an effect on the regeneration of damage to the Langerhans island β cells of the pancreas tissue with the treatment of doses of 50 mg / kg BW, diabetic white mice and the highest fasting blood glucose (109 mg/dl) and the regeneration effect of ß cell (45 g, 45%) diabetic mice. The morphological expression of the percentage of β cells undergoing regeneration of β cells on Langerhans island was significant with the percentage of β-segment cells of the Langerhans island view of pancreatic tissue.

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