Laporan Akhir Penelitian

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PRE-CLINICAL TRIAL AUTOLOGUS MSC BONE MARROW STEM CELL DAN *ALLOGENIC PANCREATIC STEM CELL* UNTUK REPAIR SEL BETA PANKREAS PADA *DIABETES MELLITUS*

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ABSTRACT

PRE CLINICAL TRIAL AUTOLOGUS MSC BONE MARROW STEM CELL AND ALLOGENIC PANCREATIC STEM CELL FOR REPAIR OF BETA PANCREATIC CELL IN DIABETES MELLITUS WISTAR

Background: Diabetes Mellitus (DM) is a group of metabolic diseases due to abnormal insulin secretion, insulin action or both. This pancreatic produced insulin has an important function in the body in glucose regulation and utilization in almost all body tissues, especially muscle, fat and liver. When there are disorders of insulin secretion and utilization that results in diabetes mellitus, alternative therapies in DM management is the use of stem cells. Stem cell therapy alternative used here used the cells taken from adult stem cell, the bone marrow stem cell, and from transplanted pancreatic cells from donor.

Methods: This was a trial used animal models of DM induced Wistar with 50 mg/kg Aloxan. DM Wistars were divided into 4 treatment groups, group 1 was transplanted with autologous MSCs bone marrow stem cell, group 2 was given allogenic pancreatic stem cells injected with open laparotomy and intra peritoneal, group 3 was given with insulin subcutaneously, and group 4 served as control. MSC was characterized by DAB immunostaining using CD44 and CD105 markers, whereas pancreatic cell characterization was done by immunofluoresence with nestin marker as well as Elisa c peptide and insulin. The dosage was 200,000 cells/rats. The results were evaluated for BSN blood sugar, 2 hours PP, C peptide, and insulin. The results were analyzed with T test.

Results: Post therapy results in group 1 revealed significant decrease of blood sugar levels, both BSN and 2-hour PP ($p = 0015$), an increase in insulin levels ($p = 0015$) and increased insulin levels ($p = 0.002$). In group 2, there was decreased levels of BSN and 2-hour PP (0.002), an increase in insulin levels ($p = 0.000$), and increased level of C peptide ($p = 0.003$). Those receiving insulin also showed decreased levels of blood sugar, although the decrease was not as good as that in those receiving MSC and pancreatic ($p = 0.002$), increased insulin levels ($p = 0.001$) and increased levels of C peptide ($p = 0088$). Control group did not show decreased levels of sugar. Reduction in BSN level, 2 hours PP, increased c peptide and insulin in pancreatic stem cell administration was significant as compared to the MSC and insulin.

Conclusion: The administration of pancreatic stem cell therapy produces the best outcome among MSC and insulin in DM wistar.

Keywords: *DM, stem cell, allogenic, autologous*