

ABSTRAK

EFEK PUASA 12 JAM TERHADAP GAMBARAN HISTOLOGI PANKREAS MENCIT HIPERGLIKEMIA

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Hiperglikemia merupakan kondisi peningkatan kadar glukosa darah yang dapat menyebabkan kerusakan sel β pankreas dan perubahan struktur pulau Langerhans. Kerusakan tersebut ditandai dengan peningkatan degenerasi dan nekrosis sel serta penurunan luas dan diameter pulau Langerhans. Puasa 12 jam sebagai bentuk *time-restricted feeding* diketahui dapat memengaruhi metabolisme glukosa dan berpotensi memperbaiki struktur pankreas. Penelitian ini bertujuan untuk menganalisis pengaruh puasa 12 jam terhadap gambaran histologi pankreas mencit hiperglikemia induksi aloksan serta membandingkan efek puasa pada periode siang dan malam hari. Penelitian ini merupakan penelitian eksperimental dengan Rancangan Acak Lengkap (RAL) menggunakan 25 ekor mencit jantan (*Mus musculus*) yang dibagi ke dalam lima kelompok, yaitu kontrol, normal puasa 12 jam siang, normal puasa 12 jam malam, hiperglikemia puasa 12 jam siang, dan hiperglikemia puasa 12 jam malam. Hiperglikemia diinduksi menggunakan aloksan monohidrat dosis 150 mg/BB. Perlakuan puasa 12 jam dilakukan selama 14 hari. Parameter yang diamati meliputi luas dan diameter pulau Langerhans melalui analisis morfometrik, serta skor kerusakan histologi pankreas menggunakan pewarnaan Hematoksilin-Eosin. Hasil penelitian menunjukkan bahwa puasa 12 jam tidak mempengaruhi luas dan diameter pulau Langerhans, berpengaruh pada skor kerusakan histologi pankreas mencit hiperglikemia induksi aloksan. Terdapat perbedaan efek antara puasa 12 jam siang dan malam hari terhadap gambaran histologi pulau Langerhans pankreas mencit. Puasa 12 jam malam hari menunjukkan gambaran histologi Pulau Langerhans yang relatif lebih baik dibandingkan puasa 12 jam siang hari, ditinjau dari integritas struktur jaringan dan derajat kerusakan histologi.

Kata kunci: Hiperglikemia, Puasa 12 Jam, Pulau Langerhans, Histologi Pankreas

ABSTRACT

THE EFFECTS OF A 12-HOUR FASTING PERIOD ON THE HISTOLOGICAL FEATURES OF THE PANCREAS IN HYPERGLYCEMIC MICE

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Hyperglycemia is a condition characterized by elevated blood glucose levels that may cause pancreatic β -cell damage and structural alterations of the islets of Langerhans. Such damage is indicated by increased cellular degeneration and necrosis, as well as a reduction in the area and diameter of the islets of Langerhans. A 12-hour fasting regimen, as a form of time-restricted feeding, is known to influence glucose metabolism and has the potential to improve pancreatic structure. This study aimed to analyze the effects of a 12-hour fasting period on the histological features of the pancreas in alloxan-induced hyperglycemic mice and to compare the effects of daytime and nighttime fasting. This research employed an experimental method using a Completely Randomized Design (CRD) with 25 male mice (*Mus musculus*) divided into five groups: control, normal with 12-hour daytime fasting, normal with 12-hour nighttime fasting, hyperglycemic with 12-hour daytime fasting, and hyperglycemic with 12-hour nighttime fasting. Hyperglycemia was induced using alloxan monohydrate at a dose of 150 mg/kg body weight. The 12-hour fasting treatment was administered for 14 days. The observed parameters included the area and diameter of the islets of Langerhans assessed through morphometric analysis, as well as the pancreatic histological damage score evaluated using Hematoxylin–Eosin staining. The results showed that a 12-hour fasting period did not affect the area and diameter of the islets of Langerhans but did influence the pancreatic histological damage score in alloxan-induced hyperglycemic mice. Differences in effects were observed between daytime and nighttime fasting on the histological features of the pancreatic islets of Langerhans. Nighttime 12-hour fasting demonstrated relatively better histological features compared to daytime fasting, as indicated by improved structural integrity and a lower degree of histological damage.

Keywords: Hyperglycemia, 12-Hour Fasting, Islets of Langerhans, Pancreatic Histology