

Pengaruh Fasting-Mimicking Diet terhadap Kadar Glukosa Darah dan Kadar Kolesterol Total pada Tikus Model Hiperglikemia = Effects of Fasting-Mimicking Diet on Blood Glucose Levels and Total Cholesterol Levels in Hyperglycemic Rat Model

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Abstrak

Prediabetes merupakan keadaan berisiko tinggi untuk perkembangan diabetes melitus tipe 2 yang ditandai dengan hiperglikemia. Fasting-Mimicking Diet (FMD) baru-baru ini telah ditemukan sebagai alternatif pendekatan terapi untuk hiperglikemia, tetapi FMD menggunakan bahan-bahan yang tersedia di Indonesia belum diteliti. Penelitian ini bertujuan untuk mengevaluasi pengaruh FMD terhadap glukosa darah puasa (GDP), berat badan (BB), dan kadar kolesterol total pada 16 tikus jantan galur Sprague-Dawley. Tikus model hiperglikemia diinduksi dengan high-fat diet (HFD) selama 4 minggu dan streptozotocin dosis rendah (35 mg/kg) 2 tahap. Sedangkan, kelompok kontrol diberikan pakan normal diet (ND). Kelompok HFD (n=4) diberikan perlakuan secara oral sehari sekali dengan 0,5% CMC, metformin (250 mg/kg), setiap siklus FMD diberikan 4 hari FMD dan ND selama 10 hari. GDP, BB, dan kadar kolesterol total diamati selama 4 minggu. Setelah itu, tikus dikorbankan pada 10 minggu. Hasil penelitian menunjukkan pemberian FMD tidak secara signifikan menurunkan GDP pra-perlakuan dan setelah perlakuan ($p=0,055$), tetapi mengalami trend penurunan. Data menunjukkan pemberian FMD tidak memberikan perbedaan bermakna terhadap BB dan cenderung menurunkan kadar kolesterol total sehingga nilainya mirip kelompok ND. Sebagai kesimpulan, pemberian FMD menggunakan bahan-bahan yang tersedia di Indonesia menyebabkan tren penurunan terhadap GDP, cenderung menurunkan kadar kolesterol total, tetapi tidak menurunkan BB secara signifikan.

.....Prediabetes is high-risk state for the development of type 2 diabetes mellitus, and it is characterized by hyperglycemia. Fasting-mimicking diet (FMD) has recently been found to be an alternative treatment of hyperglycemia, however FMD with Indonesian ingredients haven't been studied. This study aimed to evaluate effect of FMD on fasting blood glucose (FBG), body weight (BW) and total cholesterol (TC) in 16 male Sprague-Dawley rats. The hyperglycemic model was induced by 4 weeks of high-fat diet (HFD) and multiple low doses of streptozotocin (35 mg/kg). Meanwhile, normal rats fed a normal diet (ND). HFD group (n=4) were assigned to one-daily oral treatment with 0,5% CMC, metformin (250 mg/kg), and each FMD cycle entails 4-day FMD and 10 days of refeeding ND. FBG, BW and TC were monitored in 4 weeks. Rats were sacrificed at 10 weeks. Results showed that GDP didn't decrease significantly before and after FMD treatment ($p=0,055$) but showed a downward trend. Data showed that FMD not significantly difference in BW and decrease in TC, so the value was similar to the ND group. In conclusion, FMD treatment with available materials in Indonesia resulted in downward trend in FBG, tended to lower TC but not significantly lower BW.