

ABSTRAK

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Latar Belakang: Diabetes mellitus tipe 2 dan obesitas mempengaruhi ketidakseimbangan jumlah microbiota (*dysbiosis*) yang dapat menyebabkan gangguan metabolisme glukosa dengan menghambat *Short Chain Fatty Acid* (SCFA). *Xylo-oligosaccharides* dan β -glucan dapat memperbaiki komposisi microbiota usus dengan kemampuan prebiotik.

Tujuan: Mengetahui pengaruh pemberian XOS dan β -glucan terhadap jumlah *Lactobacillus spp* dan *Roseburia spp*, SCFA, indeks atherogenic pada tikus Wistar diabetes.

Metode: Studi *randomized control- post-test only*, tikus Wistar sebanyak 28 ekor dikategorikan menjadi 4 kelompok. Kelompok (K) kontrol. Kelompok (K-), (P1) dan (P2) diberikan pakan tinggi lemak selama 14 hari, diinjeksi STZ 45 mg/kg BB dan NA 110 mg/kg BB. Kelompok (P1) diberikan XOS dengan dosis 450mg /200 g BB. Kelompok (P2) diberikan β -glucan 450mg /200 g BB. Suplementasi diberikan selama 28 hari melalui sonde. Kadar glukosa darah diukur dengan metode GOD-PAP, *Lactobacillus spp* dan *Roseburia spp* dianalisis dengan RT-PCR. TG dianalisis dengan metode GPO-PAP, HDL dianalisis dengan metode presipitasi, SCFA diukur dengan metode GCMS. Data dianalisa dengan uji *One Way Anova* dan Kruskal Wallis.

Hasil: Tidak terdapat perbedaan ($p = 0.313$) pada keempat kelompok jumlah *Lactobacillus* dan *Roseburia* setelah pemberian XOS. Pada kelompok P1 jumlah *Lactobacillus* lebih rendah dibandingkan dengan kontrol. Terdapat perbedaan bermakna pada SCFA serta indeks atherogenic setelah pemberian XOS. Terdapat perbedaan bermakna pada kelompok perlakuan setelah pemberian β -glucan terhadap jumlah *Lactobacillus* dan *Roseburia*, SCFA dan indeks atherogenic.

Simpulan: Terdapat pengaruh pemberian XOS dan β -glucan SCFA serta indeks atherogenic. Terdapat pengaruh pemberian β -glucan terhadap jumlah *Lactobacillus*, *Roseburia*, dan tidak terdapat pengaruh pemberian XOS dengan jumlah *Lactobacillus* dan *Roseburia*.

Kata Kunci: *Xylooligosaccharides*, β -glucan, *Lactobacillus*, *Roseburia*, SCFA, Indeks atherogenic

ABSTRACT

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Background: Diabetes mellitus type 2 and obesity affect the imbalance in the number of microbiota (dysbiosis) which can cause disruption of glucose metabolism by inhibiting Short Chain Fatty Acid (SCFA). *Xylo-oligosaccharides* (XOS) and β -glucan can improve the composition of the gut microbiota with prebiotic abilities.

Objective: This study was to determine the effect of XOS and β -glucan administration on the number of *Lactobacillus* and *Roseburia*, SCFA, atherogenic index in diabetic rats.

Method: Randomized control-post-test only study using 28 Wistar rats categorized into 4 groups. Group (K) control, (K-), (P1) and (P2) received high-fat diet (HFD) for 14 days then were injected with STZ and NA. (P1) was given XOS at 450 mg/200 gr BW, (P2) was given β -glucan 450 mg / 200 gr BW. Blood glucose levels were measured using GOD-PAP, TG using GPO-PAP, HDL using precipitation, *Lactobacillus* and *Roseburia* using Q-PCR. SCFA was measured using GCMS. Data were analysed using One Way Anova and Kruskal Wallis tests.

Result: There was no difference ($p = 0.313$) in the four groups in the number of *Lactobacillus* and *Roseburia* after administration of XOS. In group P1 the number of *Lactobacillus* was lower compared to controls. There were significant differences in SCFA and atherogenic index after administration of XOS. There were significant differences in the treatment groups after administration of β -glucan on the number of *Lactobacillus* and *Roseburia*, SCFA and atherogenic index.

Conclusion: There is an effect of administration of XOS and β -glucan SCFA as well as the atherogenic index. There was an effect of administration of β -glucan on the number of *Lactobacillus*, *Roseburia*, and there was no effect of administration of XOS on the number of *Lactobacillus* and *Roseburia*.

Keywords: *Xylooligosaccharides*, β -glucan, *Lactobacillus*, *Roseburia*, SCFA, *Atherogenic Index*

