Pengaruh Pemberian Diet Tinggi Fruktosa terhadap Ekspresi PCSK9 pada Plasma dan Ginjal Tikus Galur Wistar (Rattus norvegicus) = Effect of High Fructose Diet on PCSK9 Expression in Plasma and Kidney of Wistar Rats (Rattus norvegicus)

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Abstrak

PCSK9 berperan dalam regulasi homeostasis kolestrol dimana meningkatkan kadar LDL-C dengan mendegradasi reseptor LDL (LDL-R). Penelitian mengenai obat inhibitor PCSK9 masih dikembangkan namun metode uji in vivo yang memfasilitasi PCSK9 sangat terbatas terlebih di Indonesia. Maka dilakukan pembuatan model hewan tinggi PCSK9 menggunakan tikus tipe wild yang diinduksi diet tinggi fruktosa mengikuti penelitian yang telah dilakukan pada hamster dan mencit. Penelitian ini dilakukan pada tikus wistar jantan dengan menginduksi diet tinggi fruktosa (HFD) sebanyak 3mL/200grBB selama 3, 4, dan 5 minggu. Plasma dan jaringan ginjal diambil setiap durasi 3, 4 dan 5 minggu dan kadar PCSK9 diukur menggunakan uji ELISA. Sementara ekspresi PCSK9 ginjal dianalisis menggunakan metode western blot. Tikus kelompok HFD menunjukkan kadar PCSK9 plasma yang meningkat signifikan ($p<0,05$) terhadap kelompok kontrol durasi 3 dan 4 minggu. Durasi optimal peningkatan kadar PCSK9 plasma pada tikus adalah 4 minggu yang menghasilkan kadar PCSK9 sebesar 1389,02 ng/mL. Sementara kadar PCSK9 ginjal menurun signifikan ($p<0,05$) terhadap kelompok kontrol durasi 3 dan 4 minggu. Ekspresi mature PCSK9 ginjal kelompok HFD lebih tinggi dibandingkan kelompok kontrol.

.....PCSK9 plays a role in the regulation of cholesterol homeostasis which increases LDL-C levels by degrading LDL receptors (LDL-R). Research on PCSK9 inhibitor drugs is still being developed but in vivo test methods that facilitate PCSK9 are limited, especially in Indonesia. Therefore, an animal model for high PCSK9 was created using wild-type rats induced by a high-fructose diet following research that had been conducted on hamsters and mice. This research was conducted on male Wistar rats by inducing a high fructose diet (HFD) of 3mL/200grBW for 3, 4, and 5 weeks. Plasma and kidney tissue were collected every 3, 4 and 5 weeks and PCSK9 levels were measured using the ELISA test. While kidney PCSK9 expression was analyzed using western blot method. The HFD group rats showed significantly increased plasma PCSK9 levels ($p<0.05$) compared to the control group for 3 and 4 weeks duration. The optimal duration of increasing plasma PCSK9 levels in rats is 4 weeks which results in PCSK9 levels of 1389.02 ng/mL. Meanwhile, kidney PCSK9 levels decreased significantly ($p<0.05$) compared to the control group for 3 and 4 weeks duration. The expression of kidney mature PCSK9 in the HFD group was higher than the control group.