

The effect of four weeks restricted diet on serum soluble leptin receptor levels and adipocyte leptin receptor density in normoweight rattus norvegicus strain Wistar

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Abstrak

Salah satu mekanisme terjadinya resistensi leptin pada obesitas adalah kelainan reseptor leptin (Ob-R). Beberapa penelitian membuktikan bahwa aktifitas ikatan leptin di serum manusia berhubungan dengan reseptor leptin terlarut (soluble leptin receptor) dan restriksi asupan energi menyebabkan penurunan kadar leptin darah. Penelitian ini adalah untuk mengetahui beda kadar reseptor leptin terlarut serum dan densitas reseptor leptin jaringan lemak adventisial aorta setelah dilakukan restriksi diet selama 4 minggu. Kadar reseptor leptin terlarut diukur dengan ELISA dan densitas reseptor leptin di jaringan lemak dengan imunohistokimia. Kadar reseptor leptin terlarut pada kelompok perlakuan 40% diet normal lebih rendah dibanding kontrol ($p=0,02$). Tidak didapatkan perbedaan reseptor leptin terlarut yang bermakna antara kelompok perlakuan 40% diet normal, 1 hari puasa-1 hari makan normal dan 1 hari puasa-2 hari makan normal. Di sisi lain, densitas reseptor leptin jaringan lemak adventisial aorta justru lebih tinggi pada kelompok restriksi 40% daripada kontrol. Restriksi diet 40% kalori normal harian menurunkan kadar reseptor leptin terlarut di serum, tetapi meningkatkan densitas reseptor leptin jaringan lemak adventisial aorta tikus. Perubahan ini mungkin merupakan akibat mekanisme up regulation dalam mempertahankan homeostasis. (Med J Indones 2006; 15:145-50)

One of the five possible mechanisms of leptin resistance in human obesity is the defect in the leptin receptor (Ob-R). Evidence has accumulated that leptin-binding activity in human serum is related to a soluble form of the leptin receptor, and restriction of energy intake resulted a decrease in circulating leptin levels. Aim of this study is to examine the difference of serum soluble leptin receptor level and leptin receptor density in rat adipose tissue of adventitial aorta after four weeks treated with different restricted diets. Soluble leptin receptor level was measured by ELISA and leptin receptor density by using immunohistochemistry. The soluble leptin receptor in group treated with 40% of normal daily calorie diet was found significantly lower than control ($p = 0.02$). There were no any significant differences among group treated with 40 % of normal daily calorie diet, "1 day fast-1 day eat", and "1 day fast-2 days eat" groups, and among 1 day fast-1 day eat", "day fast - 2 days eat" and control groups as well. On the other hand, leptin receptor density in adipose tissues was higher in restricted diet group than control. Diet of 40 % normal daily calorie for 4 weeks decreased soluble leptin receptor level, but increased adipocyte leptin receptor density of the adipose tissue of rat adventitial aorta. These changes may be resulted from an up regulation mechanism in relation with homeostatic maintenance. (Med J Indones 2006; 15:145-50)