Profil penglepasan granula gimogen kelenjar pankreas tikus wistar jantan Pada Pemberian Sukrosa, Minyak Jagung Dan Putih Telur

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Abstrak

Latar belakang : Kelenjar eksoktin pankreas mensekresikan amilase, protease dan lipase yang disimpan dalam bentuk granula zimogen pada bagian apikal sel asinus pankreas. Regulasi sekresi setiap enzim pencernaan diduga diatur tersendiri. Hal ini menyiratkan dugaan bahwa dalam satu granula zimogen mengandung satu jenis enzim, namun belum ada penelitian yang mengungkapkannya. Penetitian ini bertujuan untuk menemukan pola sekresi granula zimogen yang berbeda pada pemberian karbohidrat, protein, dan lemak. Bahan dan cara kerja : 30 ekor tikus Wistar jantan dibagi dalam 5 kelompok, yaitu: kelompok I (kontrol), kelompok II (sukrosa), kelompok III (putih telur), kelompok IV (minyak jagung), dan kelompok V (campuran ketiganya). Hewan coba dicekok makanan yang sesuai 3x sehari selama 1 hari untuk adaptasi pankreas. Hewan kontrol diberi pellet ad libitum masing-masing selama 1 jam sebanyak 3 kali. Pada saat perlakuan, hewan coba dicekok 1 x dan hewan kontroi dipuasakan. Setelah 7 jam keduanya dibedah dan diambil pankreasnya lalu dibuat sediaan histotogi dengan pulasan Gomori's krom alum hematoksilin floksin. Asinus pankreas diamati dibawah mikroskop dan diukur diameter apikobasal dan laterolateral sel asinus serta diameter asinusnya. Data yang diperoleh diuji homogenitasnya dengan uji Levene dan uji anova same multiple comparison untuk menguji perbedaan diameter apikobasal, dan diameter asinus antar perlakuan sedangkan untuk menguji perbedaan diameter laterolateral antar perlakuan ditakukan uji nonparametrik Kruskat Wallis dilanjutkan dengan uji Mann Withney.

Hasil dan kesimpulan : Terdapat perbedaan bermakna (p <0,01) diameter apikobasal, laterolaterat set dan diameter asinus pankreas tikus kontrol dengan yang dicekok sukrosa dan minyak jagung. Hal ini menunjukkan bahwa sekresi enzim pencernaan dipengaruhi oleh diet. Ada perbedaan yang bermakna (p < 0,01) diameter apikobasal dan diameter asinus antara tikus yang dicekok sukrosa dengan tikus yang dicekok putih telur, tetapi tidak ada perbedaan yang bermakna (p > 0,01) diameter apikobasal, taterolaterat sel asinus dan diameter asinus pada tikus kontrol dibandingkan dengan tikus yang dicekok putih telur dan campuran dan antara tikus yang dicekok sukrosa dengan tikus yang dicekok campuran. Hal ini terjadi karena pengaruh protease inhibitor yang meningkatkan sintesis protease dan amilase. Dapat disimpulkan bahwa pemberian lemak (minyak jagung) mengakibatkan sekresi lebih banyak granula zimogen yang mengandung lipase, dibandingkan dengan pemberian karbohidrat, protein, dan campuran ketiganya. Sedangkan protease inhibitor yang terdapat di dalam putih telur diduga meningkatkan produksi protease dan amilase dan menstimutasi pembentukan granula zimogen yang hanya mengandung tripsinogen, kimotripsinogen dan amilase. Hal ini membawa dugaan bahwa satu granula zimogen hanya mengandung satu jenis enzim saja. <hr><i>Background: The pancreatic exocrine gland secretes amylase, protease and lipase, which are stored in the form of zymogen granules at apical site of pancreatic acinl cell. The secretion of each digestive enzyme is thought to regulate in different manner. It is assumed that one zymogen granule contains only one specific enzyme. But until now, there is no supporting data explaining about that. The aim of this study is to

observe the secretory pattern of zymogen granules as a reaction of carbohydrate, protein and fat administration. Method of investigation: 30 male Wistar rats were used and divided in 5 groups: group ((control), II (sucrose), Ill (white part of egg), IV (corn oil), V (mixed of sucrose, white part of egg and corn oil). In adaptation stage of pancreas, the experimental rats were administered with appropriate food 3 times daily for one day while control rats were administered with pellet ad libitum 3 times daily for hour each. On the day of experiment, the experimental rats were administered with the appropriate food land the control rats were fasted. After 7 hour, all of the rats were sacrified and pancreatic glands were isolated. The pancreatic glands were processed for histological slides and were stained with Gomori's Chrome Alum Hematoxiliin Phioxine. The pancreatic glands were examined under light microscope. The diameter of apicobasal, laterolateral and acinus from acini cells were measured. The data than were tested with Levene's homogeneity test, anova test and multiple comparison to analyze the difference in apicobasal and acini diameter between groups. Laterolateral diameter was tested with Kruskat Wallis nonparametric test and Mann Wdhney test to analyze the difference in laterolateral diameter between groups.

Result and conclusion: there were significant differences ($p<0.01$) in apicobasal, lateroteral cells and pancreatic acinus diameter between control rats and sucrose administration rat and corn oil administration rat. The result showed that the digestive enzyme secretion are influenced by the diet. There were significant differences ($p < 0.01$) in apicobasat cells and acinus diameters between sucrose administration rat and white part of egg administration rat, but there were no significant differences ($p > 0.01$) in apicobasal, laterolateral cells and pancreatic acinus between white part of egg administration rat and mixture food administration rat; and between sucrose administration rat and mixture food administration rat. These results might be occurred due to the presence of protease inhibitor, which increased the synthesis of protease and amylase. We concluded that the administration of fat (corn oil) would cause higher secretion of zymogen granules which contain the lipase than the administration of carbohydrate, protein and mix of the aboves. it assumed that the protein inhibitor in white part of egg increase the production of protease and amylase and resulting the formation of zymogen granules which contain only trypsinogen, chymotrypsinogen or amylase enzymes. The results of our experiment suggested that one zymogen granule may contain only one specific enzyme.</i>