

Abstract

MECHANISM OF REGULATION TRANSPORTER FOLAT SLC19A1 AND FOLATE RECEPTOR α IN DUODENUM HYPERHOMOCYSTEINE RATTUS NORVEGICUS WITH MODERATE EXERCISE AND FOLATE DIET

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Background: Hyperhomocysteine is a pathologic condition that characteristic of increasing concentration of total plasma homocysteine and one independent factor for cardiovascular disease such ischemia heart disease, stroke and peripheral vascular disease. Stroke has a big impact on public health and health problem in the world due to high morbidity and mortality also the main cause of disability in developing country.

Objective: To prove that moderate intensity training and folat diet increase regulation of folate transporter through increase expression of SLC19a1, Folate Receptor α also PGC1 α , so increase 5 MTHF as a active folate and the result decrease homocystein in circulation.

Methods: Twenty eight Rattus Norvegicus strain wistar, 3 month age with body weight 150-200 gram. Previous study two rat has diet methionin 1 g/kg/day/4 weeks, after 4 weeks collect the blood to homocysteine examination with ELISA method. The sample has moderate hyperhomocystein level. Subject divided into four group with each grup has 7 rat. Group 1 was control group (K), group 2 receive diet folat 2 mg/kg/day/ 6 weeks (P1), group 3 receive exercise training 30 minutes/5x/day/6 weeks (P3) and group 4 combination diet folat also exercise traing for 6 weeks (P4). After 6 weeks observation all subject were terminated to collect the blood and duodenum, 24 hour after the last observation. Homocysteine and 5MTHF examination with ELISA, immunohistochemistry for SLC 19a1, Folate Receptor α and PGC 1 α . Analysis data with M Anova statistic and path analysis with SPSS 17.0.

Results: Significant increase expression SLC 19a1, FR α dan PGC1 α compare with control group (SLC19a1: P1 p <0,0001, P2 p<0,0001, P3 p < 0,0001) (RF α P1 p<0.0001, P2 \pm 2,55 p<0.0001, P3 p<0.0001) (PGC1 P1 p<0,0001, P2 p<0,0001, P3 p<0,0001) , but there were significant difference between homocysteine and 5 MTHF (Hcy P1 p= 0,526, P2 p= 0,526, P3 p= 0,526), (5 MTHF P1 p= 0,543, P2 p= 0,543, P3 p= 0,543). On path analysis found there is a strong correlation between moderate intensity training and folate diet through expression of SLC19a1(p=0.000,b=0,458 (P2) b= 0 ,645(P1), FR α (p= 0,001 b= 0,591) and moderate intensity training through expression of PGC1(p=0,003, b= 0,401 and b=0,591).

Conclusion: Exercise training with moderate intensity and folate diet increasing regulation of folat transporter in duodenum hyperhomocysteine rattus norvegitus through path folate diet, moderate intensity training , SLC19a1, FR α , PGC 1 α .

Key word: Hyperhomocysteine, moderate intensity training, folate diet, folate transporter