

ISEI Abstract – “Session theme number – 4”

Effect of exercise on enteric nervous system and the dysfunction of colon in type 2 diabetes rat

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ABSTRACT

**[Objective]** Enteric nervous system (ENS), as a local nervous system, is relatively independent to ectogenic innervation of gastrointestinal tract. This study would observe the effect of aerobic exercise and dietary patterns on enteric function in type 2 diabetes rats and analyze its enteric nervous mechanism.

**[Methods]** The rat model of Type 2 diabetic was induced by feeding high lipid food and injection of streptozotocin (30mg/kg, i.p.), and the rats were divided into 4 groups: diabetes control group (DC), high fat diet group (HFD), exercise group (E) and exercise combined with high fat diet group (E+HFD). Some other healthy rats were arranged into normal control group (NC). The rats in E group and E+HFD group performed 8-week swimming training (5 times/week, 60 min/time). The colon samples were collected at the end of 8th week for observation of the pathological changes by HE staining, transmission electron microscope (TEM) and for detection of colonic tension and expression of PGP9.5, SP and VIP.

**[Results]** 1) Diabetes induced significant myenteric plexus damages and marked neurons reduction, while exercise protected the enteric nervous system from injuries (Figure 1); 2) The expression of SP significantly increased in rats with long-term aerobic exercise combined with a reasonable diet. However, high-fat diet combined with exercise can not upregulate SP obviously; 3) The positive expression of VIP in colon significantly increased in both E group and E+HFD group; 4) Aerobic exercise attenuated atrophy and increased tension in colonic smooth muscles.

**[Conclusion]** Diabetes induces muscular atrophy and tension attenuation in colonic smooth muscle, which can be reversed in some extent by aerobic exercise through the remodeling of enteric nervous system.

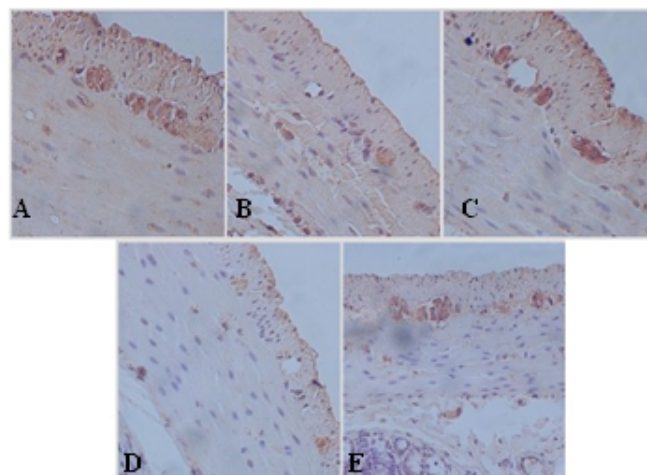


Figure 1. The expression of PGP 9.5 in colon (SP×400)

A:NC; B:DC; C:E; D:HFD; E: E+HFD