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Changes of duodenal myoelectric activity in experimental "Pi Xu" (weakness of spleen) tree shrews

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Abstract

AIM: "Pi Xu", or the weakness of spleen, has been investigated extensively in our laboratory, and several ("Pi Xu" animal models (in mice, rats and golden hamsters) have been established. The change of structure and function in the gut, digestive glands and the reproductive organ were studied. In order to explore the mechanisms of "Pi Xu" and obtain experimental evidence more close to pathologic status of human beings, the lowest primate animals tree shrews had been introduced into this field for the first time in our lab. More and more evidence shows that the myoelectric activity and motor activity of gastrointestinal tract change significantly in this syndrome. Here we investigated the changes of duodenal myoelectric activity in the experimental "Pi Xu" tree shrews.

METHODS: Fourty eight male tree shrews (Tupaia belangeri chinensis), 105-170 g, were divided into 2 groups in one groups infusodecoction of rhubarb (Rheum Palmatum L.et. R. Palmatum var, tanguticum Maxim) (2 g/100 g B.W./d) was given by gastrogavage to induce "Pi Xu", other group the same volume of water was given as control. On the 9th experimental day, in part of animal from each group bipolar electrodes were implanted on the serosal surface of duodenal bulb to record myoelectric activity after animals' recovering from the operation 2 d later. All animals were anesthetized to record myoelectric activity after absolute diet for 18-24 h. The rest "Pi Xu" animals were divided into other 3 groups: one was given (Sijunzitang), another was continuously given rhubarb, the rest was given water. On the 18th day, all animals were treated as above to record the myoelectric activity.

RESULTS: Our results showed in the "Pi-Xu" tree shrews, the slow wave frequency (SWF) of duodenal myoelectric activity increased significantly in animals treated with rhubarb for 18 d (31 ± 1 cycles/min, n = 5, P < 0.01), although there was no difference in SWF between "Pi Xu" group (21 ± 6 cycles/min, n = 5) and the control (22 ± 6 cycles/min, n = 5). The duration of phase 3 of interdigestive myoelectric complex (IDMEC) was 6.3 ± 2.7 min. In control tree shrews. In "Pi Xu" tree shrews, this duration (3.5 ± 0.7 min, n = 6) was greatly decreased compared with the controls (P < 0.05). Those treated with rhubarb for 18 d (1.6 ± 0.8 min, n = 5) did not differ significantly from "Pi Xu" animals but did differ greatly from the controls (P < 0.01).

CONCLUSION: All above suggested that the malfunction of intestine in the "Pi Xu" syndrome may partially result from the decrease of myoelectric activity in duodenum.

Key words: Duodenal myoelectric activity; "Pi-Xu" (weakness of spleen); Tree shrews

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