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Measurement of surface electrical activation small intestine and plasma cholecystokinin concentrations in patients with irritable bowel syndrome

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Abstract

AIM: The measurements of the small intestinal electrical activity have been measuned by using serosal or intraluminal electrodes in the small intestine except in one report measured by the surface electrodes in 1993. In this study, we made an attempt that the small intestine electrical activity was measured by surface electrodes and deduced the method to be feasible and scientific. With the method, the surface electrical activity of the small intestine was studied in the patients with irritable bowel syndrome (IBS).

METHODS: One pair of scale electrodes were placed near the umbilicus with a distance of 5 cm. Two bipolar signals derived from the electrodes were amplified by the polygraph system and simultaneously digitized filtered and stored on a personal computer. The power spectrum of 30 min surface recording of each subject was calculated using the periodogram method by which the dominative frequency of the small intestine electrical activity of each subject could be demonstrated, and the rules of the small intestinal electrical activities were to be explored. The study was conducted in two groups of subjects, control group (12 cases) and IBS group (13 cases).

RESULTS: The dominative frequencies of the slow waves of the small intestinal electrical activities ranged from 9-12 cycles perminute (CPM) in both groups with a mean value of 10.67 ± 0.21 cpm in the control group and 11.03 ± 0.24 cpm in the IBS group. The plasma CCK concentration was significant higher in the IBS group than in the control group ($P < 0.005$).

CONCLUSION: This result indicates that the slow waves of the small intestinal electrical activities may not be related to symptoms and the small intestinal motility of patients with IBS. The plasma CCK concentration may be related to the symptoms and the intestinal abnormal motility in the patients with IBS.

Key words: Slow waves; Small intestinal electrical activities; Irritable bowel syndrome; CCK

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