OVINE MODEL FOR CLEAR-CUT STUDY ON THE ROLE OF CHOLECYSTOKININ IN ANTRAL, SMALL INTESTINAL AND GALLBLADDER MOTILITY

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Cholecystokinin (CCK) is one of the major gastrointestinal hormones involved in the control of digestive tract and gallbladder motility. Its action involves several mechanisms. The ovine model was developed in order to further explore the role of CCK in gastric, small intestinal and gallbladder motility under various experimental conditions. Five Merino sheep were used with bipolar electrodes implanted to their antrum, entire small intestine and gallbladder as well as strain gauge force transducers were attached to the duodenum and gallbladder fundus, near the electrodes. In the course of chronic experiments, the myoelectric and motor activity were recorded by means of the adapted electroencephalograph. Among the variety of CCK-octapeptide or cerulein doses, three doses of each CCK peptide were selected and then applied for various time periods. Finally, the effects of the hormones administered within 30 s during phase 2 of the same or different migrating myoelectric complexes (MMCs) on gastrointestinal and gallbladder myoelectric and motor activity were studied in fasted and non-fasted animals. Injection of the highest dose inhibited rumination in four of the five sheep and inhibited phase 3 MMC in the antroduodenal region. Hormone administration inhibited dose-dependently antral myoelectric activity. The effects of moderate dose of both CCK peptides on myoelectric activity of the duodenal-jejunal was usually opposite (i.e. stimulatory) than that of the ileum. Gallbladder response to CCK peptides exhibited mostly the tonic character, and in some experiments, the slow wave frequency and amplitude were altered. It is concluded that CCK acts on several targets and different mechanisms underlie its multiple actions on gastrointestinal and gallbladder motility in sheep.

Key words: antrum, small bowel, gallbladder, myoelectric and motor activity, cholecystokinin octapeptide, cerulein

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