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Ghrelin and glucagon-like peptide-2 increase immediately following massive small bowel resection

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Abbreviations: GLP-2, glucagon-like peptide-2; 80% SBR, 80% small bowel resection.

abstract and keywords

Children with short bowel syndrome face life-threatening complications. Therefore, there is an urgent need for a new therapy to induce effective adaptation of the remnant intestine. Adaptation occurs only during feeding. We focused on preprandial acyl ghrelin and des-acyl ghrelin, and postprandial glucagon-like peptide-2 (GLP-2), which are known to have active orexigenic and trophic actions. This study aims to clarify the secretion trends of these hormones after massive small bowel resection and to obtain basic data for developing a new treatment. Sixty-three growing male rats were used: 3 were designated as controls receiving no operation and 60 were randomized into the 80% small bowel resection (80% SBR) group and the transection and re-anastomosis group. Changes in body weight, food intake, and remnant intestine morphology were also assessed for 15 days after the operation. Acyl ghrelin and des-acyl ghrelin levels increased immediately, equivalently in both operation groups ($P = 0.09$ and 0.70). Interestingly, in 80% SBR animals, des-acyl ghrelin peaked on day 1 and acyl ghrelin peaked on day 4 ($P = 0.0007$ and $P = 0.049$ vs controls). GLP-2 secretion was obvious in 80% SBR animals ($P = 2.25 \times 10^{-6}$), which increased immediately and peaked on day 4 ($P = 0.009$ vs controls). Body weight and food intake in 80% SBR animals recovered to preoperative levels on day 4. Morphological adaptations were evident after day 4. Our results may suggest a management strategy to reinforce these physiological hormone secretion patterns in developing a new therapy for short bowel syndrome.

Key Words:

Acyl ghrelin, Des-acyl ghrelin, GLP-2, adaptation, massive small bowel resection, short bowel syndrome