

ラット小腸における実験的インドメタシン縦走潰瘍の発生機序 —特に潰瘍と微小血管形態との関係について—

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(原稿受付日 平成15年4月9日)

Mechanism for the Occurrence of Experimental Indomethacin-Induced Longitudinal Ulcers in Rat Small Intestine: Special Reference to the Relationship between the Shape of Ulcers and Microvascular Architecture

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Abstract

One of the most important and distinctive features of Crohn's disease is the formation of longitudinal ulcers on the intestinal mesenteric site. The precise mechanism for the occurrence of longitudinal ulcers, however, still remains unclear. Similar longitudinal ulcer is experimentally made by the oral administration of indomethacin to rats. The purpose of this study is to clarify the reason why the longitudinal ulcer occurs on the mesenteric site by indomethacin in rats. This study may help to elucidate the mechanism for the occurrence of longitudinal ulcers in Crohn's disease.

Male Wistar rats weighing 250-300g were used. Indomethacin-induced intestinal injury to the rats were investigated at 6, 12, 24 and 48hours after the single oral administration of indomethacin (40mg/kg). The intestines were opened along the anti-mesenteric site and the macroscopic findings and microangiographic appearances in each group(n=5-7) were investigated.

In the macroscopic findings, spotty erosions and scattered small ulcers were visible at an early phase in the experiment. Multiple ulcers, fused ulcers, short and narrow longitudinal ulcers and finally the formation of long and broad longitudinal ulcers along the mesenteric site were observed to be formed by the time. Spotty erosions and small ulcers are considered to be the initial appearances of longitudinal ulcers. On the microangiographic appearances of the vessel architecture in the normal rat small intestine, the long branches distributed on the anti-mesenteric site were large in diameter and rich in submucosal collateral circulation, which indicates compensatory hemodynamics. On the other hand, the short branches distributed on the mesenteric site were small in diameter and poor in submucosal collateral circulation. Early morphologic changes in the microangiogram showed discontinuous multifocal interruptions of the short and long branches in the submucosal layer on the mesenteric site. Continuous interruptions of the short and long branches appeared with time along the mesenteric site, and then longitudinal ulcers were observed.

Therefore, the mechanisms for the occurrence of longitudinal ulcers on the mesenteric site could be explained as the microcirculatory disturbances based on the anatomical distribution of arteries in the intestinal wall.

Key words : Indomethacin; Rat; Small intestine; Longitudinal ulcer; Microangiography.

