World Journal of Gastroenterology

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DOI: 10.3748/wjg.v6.iSuppl3.122

World J Gastroenterol 2000 September 15; 6(Suppl 3): 122
ISSN 1007-9327 (print) ISSN 2219-2840 (online)

Effects of heat exposure on the membranous structure of rat's intestinal epithelium and the biochemical indexes

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Received: May 23, 1999
Revised: January 5, 2000
Accepted: February 18, 2000
Published online: September 15, 2000

Abstract

AIM: To study the effects of heat exposure and swimming on membranous structure of the small intestinal epithelium and the biochemical indexes.

METHODS: The distribution of the intra membranous particles (IMPs) in enteric epithelium of SD rats and the number of IMPs were analyzed with freeze-etching technique and TxB2, PGFIa, PRL, CORT and total SA (TSA) were measured with the techniques of biochemistry and radio immunity.

RESULTS: Heat exposure markedly affected the distributive pattern of IMPs in intestinal epithelium and made the numbers of IMPs on the PF and EF faces of cell membrane and nuclear membrane decreased. Swimming exacerbated the above changes. And in the meantime heat exposure resulted in the massive releasing of the body-hurting substance as TxB2 and reducing of the body-protecting substance as PGFIa. TSA increased obviously. These changes recovered partly after heat exposure, but the number of IMPs on both PF and EF faces and certain biochemical indexes were still not restored to the levels as in the control group.

CONCLUSION: Heat exposure and swimming can make the cellular catabolism accelerated and anabolism reduced, then bring about the numbers of IMPs of intestinal epithelium membrane and nuclear membrane decreased, and the distribution was abnormal. TxB2, PGFIa, PRL, CORT and TSA were changed abnormally during heat exposure. And above indexes showed no notable evidence of recovery after stopping heat exposure 4-24 h; the delayed injury was obviously presented.

Key words: Heat exposure; Intestine, small; Epithelium; Cell membranes; Freeze etching; Radioimmunoassay; Biochemical indexes

Zhu GB, Li JH. Effects of heat exposure on the membranous structure of rat's intestinal epithelium and the biochemical indexes. *World J Gastroenterology* 2000; 6(Suppl 3): 122 Available from: URL: http://www.wjgnet.com/1007-9327/full/v3/iSuppl3/122.htm DOI: http://dx.doi.org/10.3748/wjg.v3.iSuppl3.122

E- Editor: Hu S

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