Effects of E. faecium on immune system in rats model of experimental intestinal disbacteriosis

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Objectives

It is known that one of the most promising ways for the treatment and preventive maintenance of intestinal disorders is the usage of probiotics. Presently the influence of probiotics on human and animals microbiota and pathogenic microorganisms is under intensive investigation. However, immunomodulatory effects of probiotic cultures on the host is studied insufficiently. It was shown that effects on the synthesis and expression of cytokines, chemokines and their receptors is strain specific. Efficiency of probiotics strain Enterococcus faecium L3 was shown at various diseases: gastritis, stomach ulcer, vaginitis, disbacteriosis. E. faecium L5 (ermB-labeled derivative of E. faecium L3) was used in order to monitor the probiotic effects of the strain on the experimental animals.

The aim of present work was to study influence of E. faecium L5 on character of cytokine expression during the course of experimental intestinal disbacteriosis.

Materials and methods

Model of disbiosis in Wistar rats was induced by the course of 15 mg ampicillin and 10 mg metronidazole for 3 days. Animals were randomly divided into 3 groups, 8 in each. Within 5 days the rats in group A were fed with 5,5x 10^8 CFU/ml E. faecium L5, group B - milk and the intact rats were used a control group (C). At the eighth day of the experiment rats were sacrificed and intestinal epithelium was immediately subjected to mRNA isolation. Expression of IL-8, IL-10, IL-1b and IL-18 have been studied by RT-PCR. Intestinal micro flora was evaluated during entire experiment.

Results

By the end of the experiment only in group A the recovery of microbiota back to normal was registered. The analysis of cytokine mRNA expression have shown the increase of IL-10 at the animals receiving E. faecium L5 as compared with group receiving milk and control animals. Expression of IL-8 mRNA in intestines have increased in all animals in group B. While in group A IL-8 expression was not registered. We have not found any differences in IL-1b and IL-18 expression between the groups.

Conclusions

Consumption of probiotic strain L5 was able to treat disbiotic condition inflicted by antibiotics. We have demonstrated significant immunomodulatory effect of E. faecium L5 which was able to increase IL-10 mRNA expression. Experimental intestinal disbiosis in rats was accompanied with the increase of IL-8 mRNA expression. This effect considered as unsuccessful factor for clinical course was abolished by the use of probiotic.