

Effects of a manno-oligosaccharide prebiotic (MOS) in DSS-induced ulcerative colitis model

Dóra Kővári

Dóra Kővári 1, Réka Babai 2, Dániel Kuti 1, Ágnes Polyák 1, Zsuzsanna Winkler 1, Krisztina Horváth 3, Szilamér Ferenczi 1, Krisztina J. Kovács 1

1 Institute of Experimental Medicine of the Hungarian Academy of Sciences

2 Budapest University of Technology and Economics

3 University of Veterinary Medicine

Text of the abstract

Introduction

Inflammatory bowel diseases (IBD) are chronic intestinal disorders resulting in weight loss, elevated cytokine levels, diarrhoea and abdominal pain. The prevalence of IBD is increasing worldwide, but background of this morbidity and effective therapy are not known yet. In animal studies, application of sodium dextran-sulphate (DSS) induces symptoms of ulcerative colitis and widely used to model the disease. It has already been shown that there is link between IBD and abnormal microbiota composition in the gut. Prebiotics are able to feed commensal gut bacteria therefore using prebiotics is one possible therapy to treat this disease

Aims

The aim of our experiment was to investigate whether a yeast cell wall manno-oligosaccharide (MOS) prebiotic affects adverse symptoms induced by DSS in mice.

Methods

Male C57/Bl6 mice had free access to tap water or 3,5% DSS in drinking water for 7 days. Half of controls and half of DSS treated animals received 500mg/bwkg MOS via oral gavage. MOS application started 4 days before DSS or control treatment. The day after last DSS administration, animals were sacrificed and body weight gain, colon length was measured, gut tissues were collected for histology and for quantitative RT-PCR analysis of cytokines and CRH mRNA expression.

Results

Our data suggest that MOS prebiotic can reduce most of the DSS-induced adverse changes, including damaged gut epithelium with high macrophage infiltration and high levels of proinflammatory cytokines (IL-1 α , IL-1 β , TNF α). Furthermore, colon and cecum tissue did not show massive inflammation in animals treated with prebiotic compared to DSS-treated mice. However, DSS-induced body weight loss was not prevented by MOS.

Conclusion

Our results indicate that MOS prebiotic could be an effective supplementary therapy in treating IBDs in the future, but more studies are required to reveal the mechanisms of action and development of IBD.

Data of the presenter

Doctoral School: Neurosciences (János Szentágothai)

Program: Neuroendocrinology

Supervisor: Krisztina J. Kovács

E-mail address: kovari.dora@koki.mta.hu