

## THE STUDY OF THE EFFECT OF FAECAL MICROBIOTA TRANSPLANT ON SELECTIVE MARKERS OF IDIOPATHIC INFLAMMATORY BOWEL DISEASES

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### Objectives

The aim of our study was to investigate the therapeutic effect of transplantation of faecal microbiota (FMT) in pseudo germ-free (PGF) animal model with induced acute ulcerative colitis (UC) on selective inflammatory markers and markers of cellular apoptosis and proliferation.

### Methods

SPF female mice of BALB/c line were subjected to selective antibiotic decontamination in order to obtain the PGF model. The mice were assigned to two groups: control group (FMT, n=18) and group with UC (DSS-FMT, n=27) chemically induced by 5-day exposure to DSS in drinking water. Both groups were subjected to 5-day therapy by human FMT. Samples from colon were monitored for immunohistochemical reactions of inflammatory markers iNOS (inducible nitric oxid synthase), COX2 (cyclooxygenase-2), proliferation marker PCNA (proliferating cell nuclear antigen) and anti-apoptotic marker Bcl-xL (B cell lymphoma-extra large).

### Results

The animal PGF model of UC exhibited significantly reduced intensity of immunohistochemical reaction and expression of markers of cellular proliferation and apoptosis in mice with medium and serious form of the disease (DSS-FMT/Mo, DSS-FMT/S, resp.) in comparison with the mild form of UC (DSS-FMT/Mi;  $p < 0.01$ ) and the control FMT group ( $p < 0.001$ ). At the same time, there was observed a significantly higher expression of inflammatory markers iNOS and COX2 in comparison with FMT control in animals DSS-FMT/Mo ( $p < 0.01$ ) and FMT-DSS/S ( $p < 0.001$ ). The positive effect of 5-day FMT therapy was reflected in the reduced expression of inflammatory markers compared to the period with induction of UC, and was also confirmed by lower activity of COX2, particularly in animals DSS-FMT/Mi ( $p < 0.001$ ) and DSS-FMT/Mo ( $p$

< 0.01). However, increased expression of inflammatory markers iNOS and COX2 in group DSS-FMT/S indicated that in this group the FMT therapy failed to alleviate the inflammatory response of colon mucosa.

#### Conclusion

Results of this study confirmed a positive influence of FMT therapy on PGF animal model with induced acute UC, reflected in reparative processes in colon mucosa, particularly in animals with mild and medium form of the disease.

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