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PREOPERATIVE MECHANICAL BOWEL PREPARATION IMPACT ON THE INTESTINAL MICROBIOME IN PATIENTS UNDERGOING LEFT-SIDED COLORECTAL CANCER SURGERY

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Background Preoperative mechanical bowel preparation remains standard in left-sided colorectal cancer surgery. However, there is no consensus on the optimal way to do it, as oral bowel-cleansing agents and rectal enema are both widely used methods. Understanding of gut microbiome impact on postoperative outcomes is emerging, thus this study aimed to compare different bowel preparation techniques impact on the intestinal microbiome.

Methods Forty patients who underwent surgery for left-sided colorectal cancer at the National Cancer Institute, Vilnius, Lithuania were randomized at a 1:1 ratio for preoperative mechanical bowel preparation with oral agents (Fortrans; Ipsen Pharma, Paris, France) or rectal enema (2 L of 0.9% NaCl) (NCT04013841). Intestinal microbiome composition was analyzed in frozen stool samples collected at baseline, 6th, and 30th postoperative days using Illumina Miseq technology (Illumina, Eindhoven, the Netherlands). Raw sequencing data were processed using QIIME 2 tools on a local Galaxy instance (https://galaxy.medunigraz.at/).

Results Using an oral agent for mechanical bowel preparation significantly decreased ?-diversity parameters ($p<0.05$). In contrast, rectal enema had no such effect on the microbiome composition ($p>0.05$). Paired analysis revealed significant differences between patients in oral agents and rectal enema groups ($p<0.05$). On the 6th postoperative day, a significant increase in Enterococcus faecalis abundance was observed in the rectal enema group.

Conclusion This study showed that mechanical bowel preparation with oral agent results in more profound intestinal microbiome composition changes. Further investigations should explain these differences impact on clinical outcomes.