Effectiveness of Fecal Microbiota Transplantation for Acute Ulcerative Colitis: A Systematic Review of Clinical Outcomes

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Introduction

- Ulcerative colitis (UC) is an inflammatory bowel disease affecting the gastrointestinal tract with mucosal inflammation; it begins distally and extends proximally to part or all of the colon (Segal et al., 2021).
- The cause of UC is unclear, but may involve immune dysfunction, genetics, microbiome imbalance, and environmental factors such as infections and diet. Major symptoms include bloody diarrhea, crampy abdominal pain, and tenesmus (Friedman et al., 2022).
- Standard of care treatment typically starts with aminosalicylates. Many patients need additional therapies, such as corticosteroids and immunosuppressants. These bring serious side effects, such as increased infection risk and bone fractures (Moayyedi et al., 2015).
- By introducing healthy flora in a patient, fecal microbiota transplantation (FMT) can modify gut microbiome and lead to restoration of protective colonic microbiota. FMT is an efficacious treatment for recurrent Clostridium difficile infections and can be a potential alternative or a complementary therapeutic option for UC (Lee et al., 2016).

Systematic Review Aim: To evaluate whether FMT, compared to placebo or standard therapy, leads to higher rates of clinical remission and endoscopic healing in UC.

Strategy

- Reviewed the literature to evaluate the efficacy of fecal microbiota transplantation compared to placebo or standard medical therapy.
- Interventions assessed included FMT therapy versus placebo and glucocorticoids. Primary endpoints gauged were clinical and endoscopic remission as well as safety profile and adverse events associated with FMT.
- Data collection:
  - Literature search was limited to peer-reviewed journal articles published within the last 10 years (2014-2024).
  - Electronic databases used: Medline-PubMed and ScienceDirect
  - Search terms used: fecal microbiota transplantation, ulcerative colitis, FMT, clinical remission, and endoscopic remission.
  - Three clinical trials were included for review and analysis.
- Population target:
  - Adults (over the age of 18) with mild to moderately active UC
  - Mayo score of 4-10 (scoring system to assess severity of UC)
  - Concomitant therapies permitted if dose stable before enrollment

Findings

Trial	Group	Subjects	Clinical & Endoscopic Remission	Clinical Response
Moayyedi et al., (2015)	FMT	36	24.0% (9)	39.0% (15)
	Placebo	34	5.0% (2)	24.0% (9)
	p-value	n/a	0.03	0.016
Paramsothy et al., (2017)	FMT	41	27.0% (11)	54.0% (22)
	Placebo	3	8.0% (3)	23.0% (9)
	p-value	n/a	0.021	0.004
Huang et al., (2022)	FMT	62	54.8% (34)	69.4% (43)
	GCCs	60	48.3% (29	65.0% (39)
	p-value	n/a	0.59	>0.99

Figure 1: This table presents the results of three 3 clinical trials, comparing clinical outcomes of FMT versus placebo or glucocorticoids (GCCs) in patients with UC. FMT showed statistically significant results in remission and response compared to placebo and FMT was similarly effective compared to GCCs.

Trial	Group	Adverse Events	Serious Adverse Events
Moayyedi et al., (2015)	FMT	8.0% (3)	8.0% (3)
	Placebo	5.0% (2)	5.0% (2)
	p-value	1.00	1.00
Paramsothy et al., (2017)	FMT	78.0% (32)	5.0% (2)
	Placebo	83.0% (33)	3.0% (1)
	p-value	0.584	0.54
Huang et al., (2022)	FMT	22.6% (14)	0.0% (0)
	GCCs	60.0% (36)	3.3% (2)
	p-value	<0.001	0.051

Figure 2: This table presents the results of three clinical trials, comparing the safety profile of FMT versus placebo or GCCs. FMT was associated with a lower rate of adverse events compared to GCCs and FMT has comparable rates of adverse events compared to placebo.

Conclusions

- FMT is effective in inducing clinical and endoscopic remission in adults with UC, as demonstrated by statistically significant results in two randomized controlled trials comparing FMT to placebo.
- FMT achieved higher rates of remission compared to placebo. When compared directly to glucocorticoids, FMT was similarly effective in inducing remission with no significant difference in remission rates between the two groups.
- FMT was associated with a lower rate of adverse events than glucocorticoids and no serious adverse events occurred in the FMT group, while two colectomies and other serious events occurred in the glucocorticoid group.
- The safety profile of FMT was comparable to placebo, with no significant differences in the number or type of adverse events; most were mild and self-limiting, such as gastrointestinal discomfort and fever.

Limitations:

- Small sample sizes
- Short follow-up periods
- Lack of blinding or randomization
- This may affect the generalizability and long-term assessment of FMT's efficacy and safety.

Recommendations:

- Future research should determine the optimal FMT administration schedule.
- Studies are needed to assess which ulcerative colitis therapies, when used in combination with FMT, yield the greatest efficacy and safety for patients.

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References