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OBJECTIVES

Considering the lack of evidence on fecal microbiota transplantation (FMT) for inflammatory bowel diseases, the aim of the present systematic review was to synthesize efficacy and safety data of FMT in patients with Crohn's disease, ulcerative colitis, or chronic pouchitis.

METHODS

Systematic searches were conducted in Pubmed, Scopus, and Web of Science. The primary endpoint was clinical remission, while clinical response and any adverse event were secondary outcomes. Pairwise meta-analyses were performed for randomized controlled trials (RCTs) using Mantel-Haenszel method and random effects model. Proportion meta-analyses were conducted for non-randomized interventional studies using mixed effects model. Subgroup analyses considering the type of stool, donor type, and disease subtype were performed. The methodological quality of RCTs was appraised by using the Cochrane risk-of-bias tool for randomized trials, and non-randomized interventional studies were assessed using the Newcastle-Ottawa Scale (NOS).

RESULTS

The systematic review resulted in the inclusion of 45 studies, of which 25 were synthesized in the quantitative analyses (five RCTs and 20 non-randomized interventional studies) (Figure 1). The included RCTs presented an overall low risk of bias (Figure 2), and the mean NOS score for the non-randomized interventional studies was 6 (ranging from 6 to 8). Pairwise meta-analyses of four RCTs showed significant differences in favor of FMT compared with placebo (clinical remission: RR 2.04 [95%CI 1.16, 3.59]; clinical response: RR 1.68 [95%CI 1.04, 2.72]) (Figures 3 and 4). A clinical remission of 33%, clinical response of 51% and a prevalence of 38% of adverse events were found in the proportion meta-analyses. Frozen fecal material and universal donors provided better efficacy outcomes. In addition, Crohn's disease patients seem to benefit more of the procedure. The results of the proportion meta-analyses by subgroups are presented in Table 1.

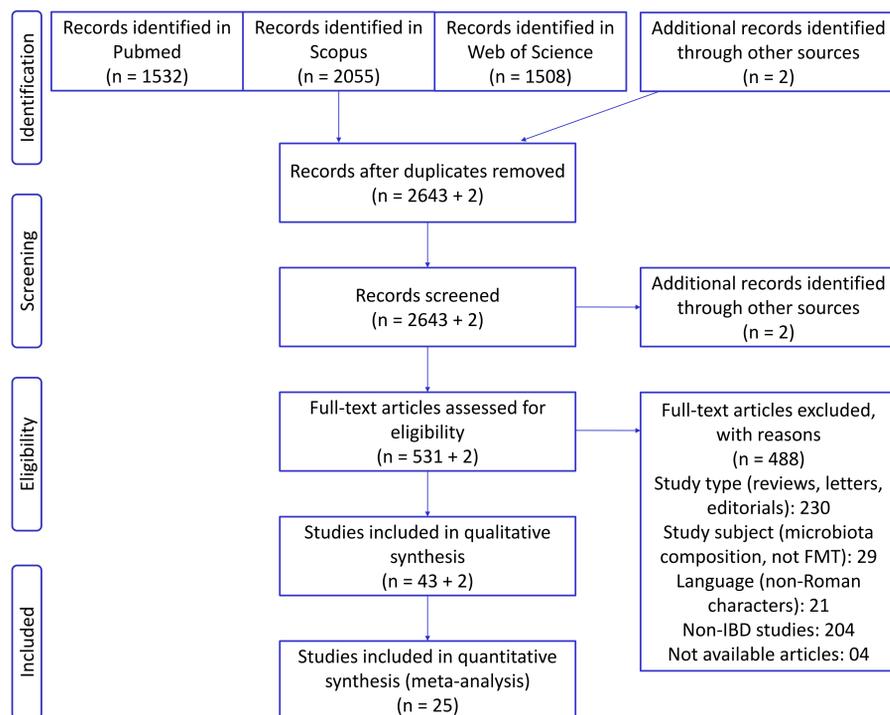


Figure 1. Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2009 Flow Diagram.

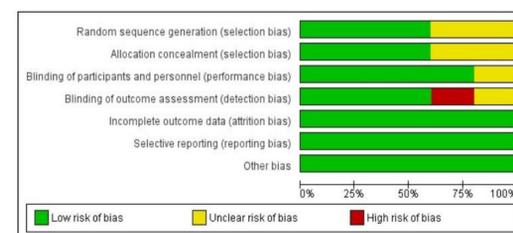


Figure 2. Risk of bias graph of included RCTs.

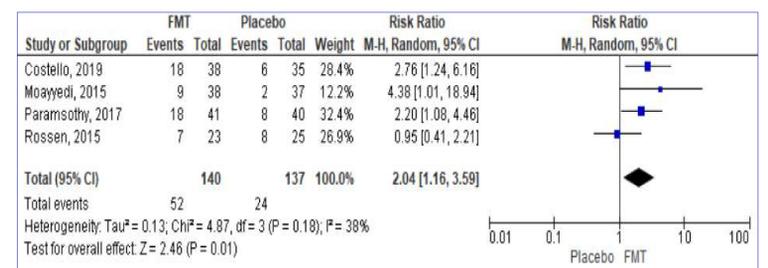


Figure 3. Forest plot for clinical remission.

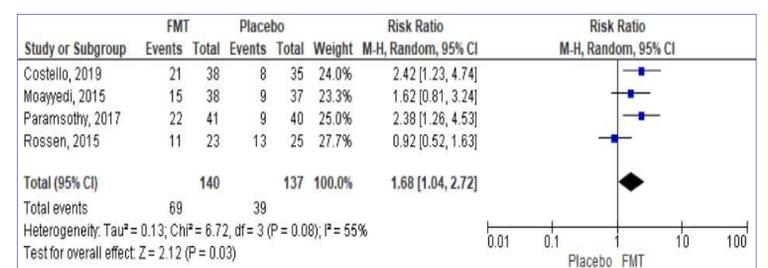


Figure 4. Forest plot for clinical response.

Subgroup/Outcome	Studies (N)	Clinical remission		Studies (N)	Clinical response		Studies (N)	Adverse events	
		Event rate (95% CI)	p-value		Event rate (95% CI)	p-value		Event rate (95% CI)	p-value
Type of stool			0.016*			0.317			< 0.001
Fresh	17	24.0% (15.9–34.6)		18	48.7% (36.6–61.0)		10	42.2% (27.4–58.5)	
Frozen	4	47.2% (38.0–56.7)		4	57.3% (45.4–67.6)		2	57.2% (14.5–91.4)	
Fresh or frozen	2	40.0% (13.9–73.2)		2	56.6% (26.1–82.8)		1	14.4% (9.5–21.3)	
Not reported	2	-		1	-		1	-	
Donor type			0.032*			0.218			0.542
Relative / acquaintances	8	20.2% (9.9–36.9)		8	37.1% (21.5–56.0)		3	56.0% (37.5–73.0)	
Universal	10	39.8% (29.1–51.6)		10	58.0% (45.6–69.4)		5	31.9% (10.1–66.1)	
Inespecific	5	37.1% (22.2–54.8)		5	60.1% (44.6–73.8)		4	35.6% (12.3–68.5)	
Not reported	2	-		2	-		2	-	
IBD subtype			< 0.001*			0.034*			0.001*
Ulcerative colitis	18	29.6% (22.6–37.8)		19	50.7% (40.8–60.5)		7	45.8% (25.4–67.6)	
Crohn's disease	5	55.6% (48.2–62.9)		4	66.3% (54.8–76.2)		1	14.4% (9.5–21.3)	
Chronic pouchitis	1	5.6% (0.3–50.5)		1	5.6% (0.3–50.5)		1	37.5% (12.5–71.5)	
Any IBD	3	41.0% (2.7–94.7)		3	58.1% (15.0–91.5)		5	44.3% (25.9–64.3)	

Table 1. Efficacy of fecal microbiota transplantation by subgroups. Note: IBD, inflammatory bowel disease; N, number. *Statistically significant.

CONCLUSIONS

The comparative analyses showed that frozen fecal material from universal donors may be related to a higher rate of clinical remission, especially for patients with Crohn's disease.

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