Fresh vs Frozen vs Lyophilized Fecal Microbiota transplant for Recurrent Clostridium Difficile Infection: A Systematic Review and Network Meta-analysis

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Introduction: Clostridium Difficile Infection (CDI) is a significant source of morbidity and mortality which is on the rise. Fecal Microbiota Transplantation (FMT) is an alternative therapy to antibiotics with a high success rate and low relapse rate. Current data regarding the efficacy of the types of FMT used, namely Fresh, Frozen and Lyophilized is conflicting. Our review attempts to consolidate this data and highlight the most efficacious treatment currently available.

Methods: PubMed/Medline, Embase, Web of Science Core Collection, and Cochrane Central Register of Controlled Trials, were systematically searched from inception through May 3, 2022. Studies in which patients undergoing any form of FMT who had failed antibiotic treatment previously were included. Both pairwise (direct) and network (direct + indirect) meta-analysis was performed using Random effects model and DerSimonian Laird approach. Risk difference with (RD) with 95% confidence interval (CI) were calculated.

Results: A total of 8 studies including 4 RCTs and 4 cohort studies were included with a total of 616 patients. Fresh FMT was determined to be most successful with 93% efficacy 0.956 95 % CI (0.913 – 0.999) followed by Frozen with 88 % efficacy 0.902 95 % CI (0.857 – 0.947) and Lyophilized with 83% efficacy 0.828 95 % CI (0.745 – 0.910) . When compared to Fresh group, lower recovery rate was noted with both Frozen group (RD -0.06 95% CI -0.11-0.00, p=0.05) and Lyophilized group (RD -0.16 95% CI -0.27--0.05, p= 0.01). The direct meta-analysis showed no statistically significant difference between fresh vs frozen group. (RD -0.051 95% CI -0.116-0.014, p=0.178) as shown in Figure 2A. No

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significant differences were noted in Frozen vs Lyophilized group as shown in Figure 2B. (RD -0.061 95% CI -0.038-0.160, p=0.617). On network meta-analysis, when compared to Fresh group, lower recovery rate was noted with both Frozen group (RD -0.06 95% CI -0.11-0.00, p=0.05) and Lyophilized group (RD -0.16 95% CI -0.27--0.05, p= 0.01).

Conclusion: Our review shows Fresh FMT to be more efficacious compared to other forms of FMT i.e. Frozen and Lyophilized techniques. Clinicians should strive to use Fresh FMT, if possible, when dealing with recurrent CDI.

