Fecal Microbiota Transplant Response in *Saccharomyces boulardii* Recipients.

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Learning Objective

Discuss implications of mycobiota alterations in fecal microbiota transplant responses.

Background

One function of commensal gut bacteria is to limit *C. albicans* colonization in the intestinal tract. Antibiotic use both leading to *Clostridioides difficile* infection (CDI) and for treatment of CDI leads to reduction in commensal gut bacteria. As a result, patients with CDI are more likely to have an overabundance of *C. albicans*. Furthermore, in one study the fungal genera *Saccharomyces, Aspergillus*, and *Penicillum* were relatively more abundant in FMT responders post-FMT than in nonresponders.[1] At our institution, *Saccharomyces boulardii* based probiotic is used for primary prophylaxis of hospital acquired CDI. In this study we investigate the effect on FMT outcome in patients who had incident *S. boulardii* administration prior to reception of FMT.

Methods

This is a five-year, retrospective cohort study assessing FMT success in patients with incident *S. boulardii* administration directly prior to FMT. Patients are included if they were aged 18 years or older and underwent FMT between January 1, 2016 and December 31, 2020 at the institution. The independent variable is a two-level categorical variable classifying patients as administered *S. boulardii* for minimum of two days prior to FMT during admission or not. The dependent variable of interest is a two-level categorical variable classifying patients as having failed FMT defined as diarrhea symptoms (≥3 unformed stools within a 24-hour period) and a positive *Clostridioides difficile* stool test within 8 weeks post FMT. Our covariates include baseline characteristics and hypothesized risk factors - patient age, gender, procedure date, time to failure, NAP-1 strain, and discontinuation of antibiotics prior to FMT. Fisher's exact statistics to test for unadjusted associations between *S. boulardii* administration and the incidence of FMT success.

Results

The study included 41 patients who underwent FMT. FMT failed in 5 total patients (12.2%). Of those with FMT failure, two patients had been administered *S. boulardii* prior to FMT. *S. boulardii* administration for at least two days prior to FMT occurred in 24 patients. The FMT success rate observed for patients administered *S. boulardii* was 91.7% (22/24) versus 82.4% (14/17) in those not administered *S. boulardii* ($p > 0.05$). More patients administered *S. boulardii* had antibiotics continued following FMT ($p = 0.01$). All other baseline characteristics were similar between groups. No patients with discontinuation of antibiotics and administration of *S. boulardii* prior to FMT experienced FMT failure.

Conclusion

In this study it was observed that patients administered *S. boulardii* had a higher numerical FMT response rate versus patients not administered *S. boulardii*, this did not result in a statistical difference. The extent of *S. boulardii* benefit may be masked by the observation that half of patients administered *S. boulardii* had antibiotics continued following FMT, a significant risk factor for FMT failure, compared to only two patients (11%) not administered *S. boulardii*. All FMT failures in the *S. boulardii* cohort occurred in patients with antibiotic continuation. No FMT failures were observed when antibiotics were

discontinued and *S. boulardii* was administered prior to FMT. This study is limited by the number of primary endpoints.]

Reference

Zuo T, Wong S, et al. Gut fungal dysbiosis correlates with reduced efficacy of fecal microbiota transplantation in Clostridium difficile infection. Nature Communications. 2018;9:3663.

Results that will be used for poster

Table 1. Baseline Characteristics

	All patients (n = 41)	***S. boulardii* Administered (n = 24)**	**No *S. boulardii* Administered (n = 17)**	**P value**
Age, mean (SD), y	71.6 (16.8)	75.8 (14.8)	65.7 (18.1)	.056
Female, n (%)	27 (65.8)	16 (66.7)	11 (64.7)	.896
Frozen FMT, n (%)	41 (100)	24 (100)	17 (100)	-----
NAP-1 Strain Primary Case, n (%)	15 (36.6)	10 (41.7)	5 (29.4)	.422
Antibiotics post FMT, n (%)	14 (34.1)	12 (50)	2 (11.8)	.011

Table 2. FMT Success

	All patients (n = 41)	**Received *S. boulardii* (n = 24)**	**No *S. boulardii* (n = 17)**	**P value**
FMT Success, n (%)	36 (87.8)	22 (91.7)	14 (82.4)	.369

Table 3. FMT Success in Patients without Antibiotic Administration

	All patients (n = 27)	**Received *S. boulardii* (n = 12)**	**No *S. boulardii* (n = 15)**	**P value**
FMT Success, n (%)	24 (88.9)	12 (100%)	12 (80%)	.231