

Fecal Microbiota Transplant Response in *Saccharomyces boulardii* Recipients

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Background

- One function of commensal gut bacteria is to limit *C. albicans* colonization in the intestinal tract.
- The use of antibiotics leading to CDI and for the 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*.
- Evidence suggests that persistence of this *C. albicans* dominant fungal dysbiosis following fecal microbiota transplant (FMT) is linked to poor response to FMT while fungal and bacterial colonization from donor stool is associated with more successful outcomes.
- In one study the fungal genera *Saccharomyces*, *Aspergillus*, and *Penicillium* were relatively more abundant in FMT responders post-FMT than in nonresponders.¹

Objective

- At Centerpoint Medical Center, *Saccharomyces boulardii* based probiotic is frequently used for primary prophylaxis of hospital onset CDI. In this study we investigate the effect on FMT outcome in patients who had been administered *S. boulardii* prior to reception of FMT.

Methods

Study Design

Five-year, retrospective, observational, single health system study

Study Period

January 1, 2016 to December 31, 2020

Patient Population

The study included 41 patients who underwent FMT

- **Independent Variable of Interest:** Administration of *S. boulardii* for a minimum of two days prior to FMT during admission or not.
- **Dependent Variable of Interest:** Failed FMT, defined as having both of the following within 8-weeks of FMT:
 - ≥ 3 unformed stools within a 24-hour period
 - Positive *Clostridioides difficile* stool test
- **Covariates:** 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.

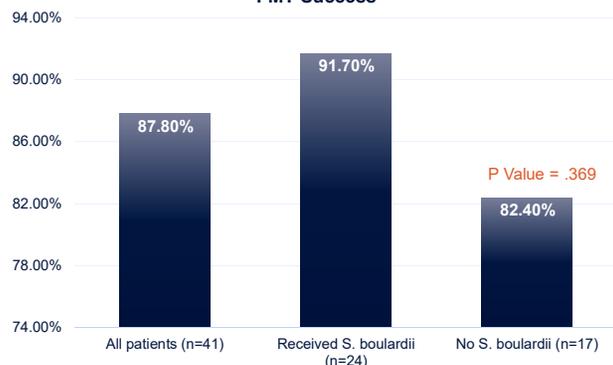
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Results

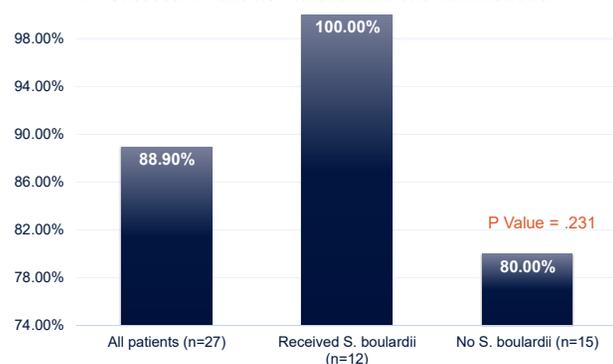
Baseline Characteristics

	All patients (n=41)	<i>S. boulardii</i> Administered (n=24)	No <i>S. boulardii</i> Administered (n=17)	P value
Age, mean (SD)	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)	----
Primary case positive for Nap-1 strain, n (%)	15 (36.6)	10 (41.7)	5 (29.4)	.422
Antibiotics post FMT, n (%)	14 (34.1)	12 (50)	2 (11.8)	.011

FMT Success



FMT Success in Patients without Antibiotic Administration



Results

- The study included 41 patients who underwent FMT.
- FMT failed in a total of 5 patients (12.2%).
 - Only two patients were administered *S. boulardii* prior to FMT.
- FMT success was observed in 91.7% (22/24) patients who received *S. boulardii* versus 82.4% (14/17) in those who did not receive *S. boulardii* ($p>0.05$).
- More patients administered *S. boulardii* had antibiotics continued following FMT ($p=0.01$).
 - No difference detected between other baseline characteristics
- All patients in whom antibiotics were not continued following FMT and administered *S. boulardii* prior to FMT experienced FMT success.

Discussion

- In this study it was observed that patients administered *S. boulardii* had a higher numerical FMT response rate versus patients who were not administered *S. boulardii*. However, the results were not statistically significant.
- The extent of *S. boulardii* benefit may be masked by the observation that half of the 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 antibiotics continuation.
- No FMT failures were observed when antibiotics were discontinued and *S. boulardii* was administered prior to FMT.
- Overall rate of FMT success align with published literature (87%).²

Conclusion

- Limited number of primary endpoints.
- No signals of harm detected with *S. boulardii* administration.
- Small study population limited ability to detect a difference, but results suggest that there may be a benefit in successful FMT with *S. boulardii* administration.

References

1. Zuo T, Wong SH, Cheung CP, et al. Gut fungal dysbiosis correlates with reduced efficacy of fecal microbiota transplantation in *Clostridium difficile* infection. *Nat Commun*. 2018;9(1):3663
2. Cammarota G, Ianiro G, Gasbarrini A, et al. Fecal microbiota transplantation for the treatment of *Clostridium difficile* infection: a systematic review. *J Clin Gastroenterol*. 2014 Sep;48(8):693-702.

