Saccharomyces boulardii: Time for Change in the Age of Cost-Effective Medicine

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Healthcare costs are rising and treatments that deliver cost-effective care are welcome. Most antibiotics cause diarrhea [1]. The incidence ranges from 3.2 to 29 per 100 cases in hospitalized patients [2]. One way to reduce diarrhea caused by antibiotics is to use a low-cost, safe probiotic like Saccharomyces boulardii. This strain has been shown to reduce the development of Antibiotic-associated Diarrhea (AAD) and Clostridium difficile-associated Diarrhea (CDAD) [3]. Both conditions can result in increased length of stays (8-20 days), re-admissions, and increased morbidity [2,3]. All lead to increased hospital costs. Since 2002, there has been a two-fold increase in CDAD and one-in-ten patients who acquire C. difficile will die [3]. Over the past 25 years, published studies on S. boulardii showed it to be beneficial for these conditions, yet few physicians regularly prescribe them. Isn’t it time for a change in the management of patients receiving antibiotics?

The probiotic S. boulardii is a unique, nonpathogenic yeast probiotic [3]. Probiotics are defined as live micro-organisms that when administered in the correct amount confer a benefit to the host [4]. Specifically, S. boulardii has been shown to survive transit in the gastrointestinal tract (i.e., resistant to degradation of enzymes, bile salts and organic acids) and inhibit the growth of a number of microbial pathogens including C. difficile [4,5]. Yeast-based probiotics, in contrast to bacterial-based probiotics, are good candidates for patients, because they cannot transfer antibiotic-resistant genes to resident bacteria. Thus, as S. boulardii is naturally resistant to antibiotics and can be safely prescribed to most patients receiving antibiotics.

Antibiotic-associated Diarrhea

Several prospective, randomized studies have shown that S. boulardii prevented AAD with no adverse side effects [2,6,7]. In these intervention studies, those in the S. boulardii groups had one-half to two-thirds fewer cases of AAD compared to the placebo groups. Admittedly, some investigators found no benefit of this probiotic strain for preventing AAD [1,8]. Nevertheless, most studies showed that S. boulardii was efficacious at preventing AAD.

Clostridium difficile-associated Diarrhea

The incidence of CDAD may range from 5% to 21% of hospitalized patients and cause up to a 7-day increase in length of hospital stay [9]. This form of diarrhea is usually nosocomially acquired, and 80% of patient are cured with either vancomycin or metronidazole therapy [10]. However, in 20% of these patients, the initial episode is followed by recurrences, which have been reported in 5% to 50% of patients after cessation of antibiotics [9,10].

Co-administration of either of the antibiotics typically prescribed and S. boulardii can decrease recurrences of CDAD by 50%, compared to just using the antibiotic regimen [9-11]. When S. boulardii is combined with high-dose vancomycin, the benefits are greatest [9-11]. Compared to another probiotic, Lactobacillus GG, S. boulardii is more effective at preventing CDAD [12]. Thus, prevention of CDAD can best be achieved by the co-administration of S. boulardii and the standard antibiotic regimen.

Systematic Reviews and Meta-Analyses

Several systematic reviews and meta-analyses have been conducted on probiotics, in general, and S. boulardii, specifically, for preventing AAD and CDAD [2-4,13,14]. In general, there is moderate-quality evidence suggesting that probiotic prophylaxis results in a large reduction in AAD and CDAD without an increase in clinically important adverse events [2,3]. In studies specifically focused on S. boulardii, prevention of AAD and recurrence of C. difficile intestinal infections was confirmed [4,14]. Hence, based on all these systematic reviews and meta-analyses, S. boulardii was effective at preventing AAD and CDAD and was well tolerated and should.

Summary

The totality of the evidence from intervention studies, systemic reviews, and meta-analyses, show that S. boulardii can play a vital role in preventing AAD and CDAD in hospitalized patients receiving concurrent antibiotics. The typical daily amount of S. boulardii needed is between 150 to 3,000 mg per day, and it costs less than $1.00 [15]. Prophylaxis with this probiotic for all patients receiving antibiotics may be a cost effective measure given the associated cost of treatments for AAD or CDAD such as antibiotics, increased length of hospitalization, or readmission. S. boulardii is generally safe for all patients except those who are extremely immune-compromised, or those with central lines [15-17]. It is, indeed, time for a change in medical practice by co-administering the probiotic, S. boulardii, with antibiotics to prevent AAD and CDAD and reduce medical costs.

Conflict of Interest

Dr. Bell is a consultant to Jarrow Formulas, who sells Saccharomyces boulardii as a dietary supplement. Ms Clark is a sales representative of the same company.

References


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