Probiotics Use in Hospital-Acquired Infections Among Trauma Patients

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Introduction

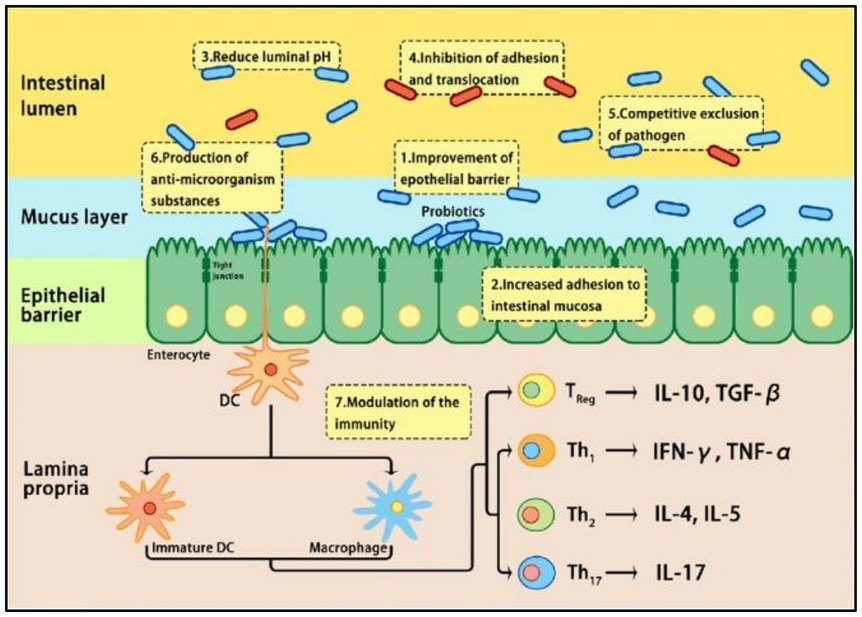
- Trauma patients are at an increased risk for acquiring infection during their hospital stay.
- Common hospital-acquired infections among trauma patients include *Clostridium difficile*, surgical site infection (SSI), ventilator-acquired pneumonia (VAP), catheter-associated UTI (CAUTI), catheter-related bloodstream infection (CRBSI) and MRSA bacteremia.
- Probiotics mitigate gut dysbiosis through restoration of immune responses.
- Previous studies demonstrated a decreased incidence of infection in critically ill patients who received probiotics.
- In the hospital setting, probiotics are prescribed in conjunction with antibiotics for prevention or treatment of infection.
- We hypothesized that use of probiotics in trauma patients would be associated with lower rates of infection and better clinical outcomes.
- The objective of this study was to compare incidence of hospital-acquired infections (HAI) between patients who received probiotics and those who did not.

Methods

- A retrospective data analysis of adult trauma patients who presented to University Medical Center (UMC) in New Orleans between January 2015-June 2023 was performed.
- Patients were divided into cohorts by probiotic administration.
- Univariate analyses were performed.
- P-values <0.05 were considered significant.

Utility of Probiotics

Probiotics mitigate gut dysbiosis through restoration of immune responses.



Zhang, Ming & Kaiji, Sun & Wu, Yujun & Yang, Ying & Tso, Patrick & wu, Zhenlong. (2017). Interactions between Intestinal Microbiota and Host Immune Response in Inflammatory Bowel Disease. Frontiers in Immunology. 8. 10.3389/fimmu.2017.00942.

Results: Probiotics at UMC

Probiotic Use at UMC (2015-2023)	
Culturelle (*Lactobacillus rhamnosus*) = 10 billion cells/capsule *Acidophilus sporogenes* = 35-25 million cells/tablet Lactinex/Floranex (*Acidophilus*) = 100 million cells/capsule	
Strains Prescribed (% patients) - **Culturelle only** - Culturelle + *Acidophilus sporogenes* - Culturelle + Lactinex/Floranex	 **93%** 3.5% 3.5%
Frequency (1 capsule or tablet) Culturelle (% patients) - **1x daily** - 2x daily - 3x daily	 **86%** 11% 3%
Treatment **duration** (mean ± SD)	**16.4** ± 17.8 days
Treatment continued past discharge (% patients)	**34%**
Time to 1st dose **from admission** (mean ± SD)	**17.6** ± 14.4 days
Time to 1st dose **from HAI** (mean ± SD)	**13.8** ± 13.8 days

- Culturelle (*Lactobacillus rhamnosus*) is the most commonly prescribed probiotic at UMC.
- Patients receiving probiotics often developed a hospital-acquired infection almost 2 weeks before starting a probiotic regimen and were not administered probiotics until 2-3 weeks after hospital admission (red text).

Results: Clinical Outcomes

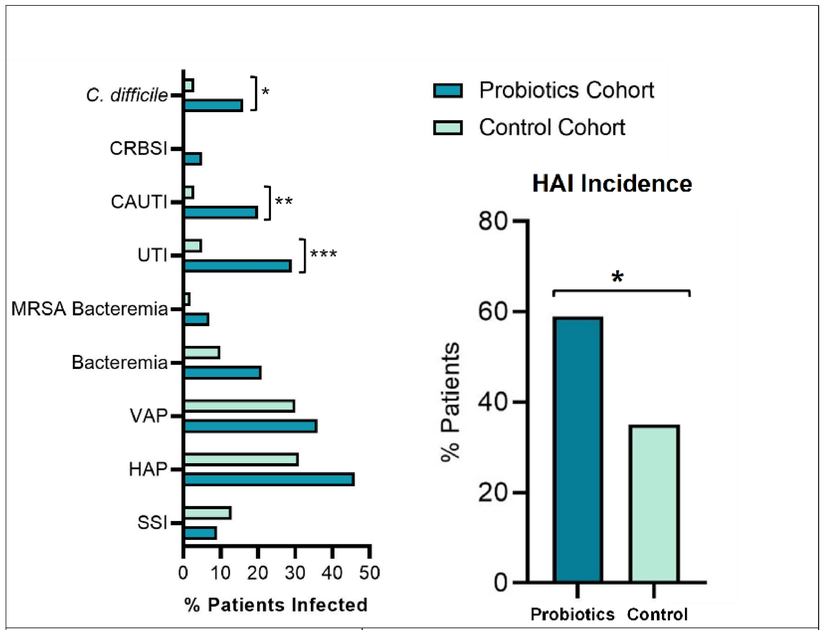


Figure 1. Percent of patients in each cohort that developed various infections.

Figure 2: Percent of patients in each cohort that developed one or more hospital-acquired infections.

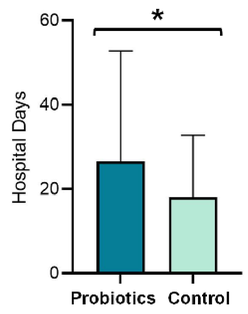


Figure 3. Comparison of hospital length of stay between cohorts. (median, IQR)

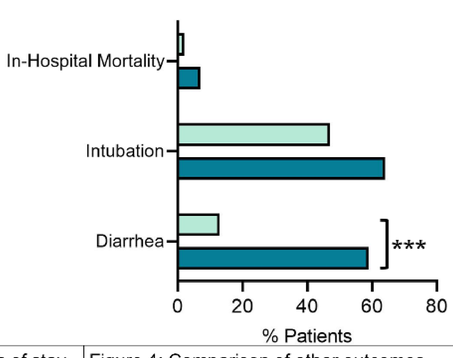


Figure 4: Comparison of other outcomes between cohorts.

Discussion & Conclusions

- Probiotics were typically administered well after the development of one or more hospital-acquired infections.
- Administration of probiotics was not associated with improvements in patient outcomes.
- However, our study suggests that probiotics were prescribed mostly as part of a post-infectious treatment plan.
- Further investigation into whether probiotics are better utilized as a preventative measure for infection instead of a supplemental treatment for infection is needed.