Evaluation of Lactobacillus Therapy on Duration of Mechanical Ventilation in Critically Ill Adult Patients

Merry Daniel, Pharm.D., Karrie Derenski, Pharm.D., BCNSP, CNSC
CoxHealth, Springfield, MO

Background

- Intestinal flora in healthy adults has important functions in maintaining the integrity of the gut mucosa, enhancing immune function, and in the prevention of both opportunistic and pathogenic micro-organism infections.
- Patients who are critically ill can have alterations in their normal gut micro-biota as a result of changes in stress hormone release, compromised immune system or impairment of blood supply to the gut.
- Critically ill patients are also often exposed to anti-biotic therapy, and are at risk for malnutrition which can propagate changes in gut micro-biota.
- Supplementing patients with probiotics, or symbiotics, with the aim to restore normal gut microbiota is thought to assist critically ill patients with recovery.
- Symbiotics, include probiotics given together with a prebiotic such as inulin, which has been shown to stimulate the growth of lactic acid producing bacteria.
- Lactic acid producing bacteria, such as Lactobacillus Rhamnosus GG, are thought to protect the body against pathogenic bacteria.
- Studies have shown an inverse relationship between probiotic therapy and ventilator associated pneumonia.
- Our aim is to evaluate the effect, if any of Lactobacillus GG (Culturelle®, Locin Industries Ltd), when coupled with EN, on the duration of mechanical ventilation.
- We hypothesize that enteral nutrition, which augments gut associated lymphoid tissue, coupled with probiotic therapy, Lactobacillus GG, should assist patients with recovery.

Primary Objective

- Compare time spent connected to a mechanical ventilator between critically ill patients, on EN therapy, treated with Culturelle® versus patients not receiving Culturelle®

Secondary Objectives

- Evaluate differences in Intensive care Unit (ICU) and hospital overall length of stay.
- Evaluate differences in ICU and hospital mortality.

Study Design

- Minimal-risk, single center, prospective, observational study meant to examine approximately 200

Control Group

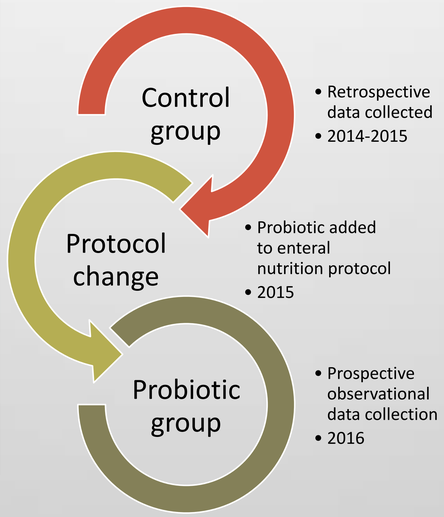
- Critically ill patients on the ventilator receiving EN therapy *without* probiotic therapy

Probiotic Group

- Critically ill patients on the ventilator receiving EN therapy *with* probiotic therapy

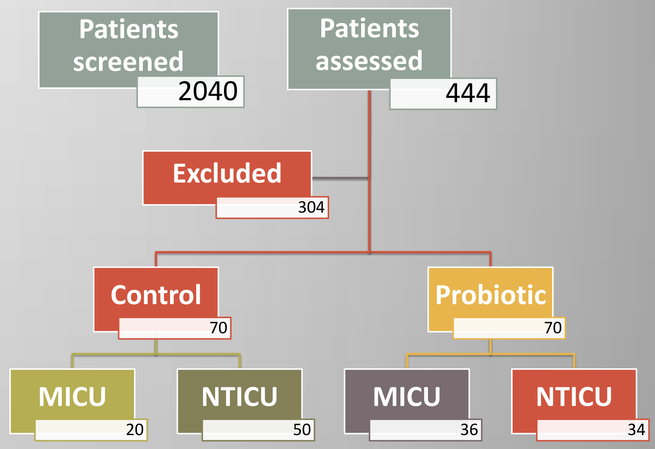
Methods and Results [preliminary[n=140)]

Inclusion	Exclusion
Age ≥ 18	Inability to be fed via gastric route
Mechanical ventilation within 72 hours of ICU admission	Contraindication to LGG or any of the ingredients found in Culturelle®
	Known or history of LGG infection
	Concurrent therapy with mannitol or lactulose
	Short gut syndrome
	Transplant or severely immunocompromised
	Patient not anticipated to survive > 7 days

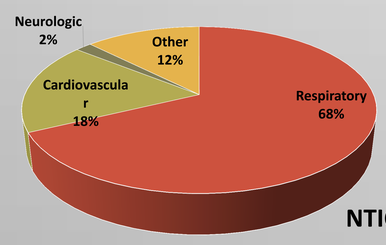


Patient Demographics

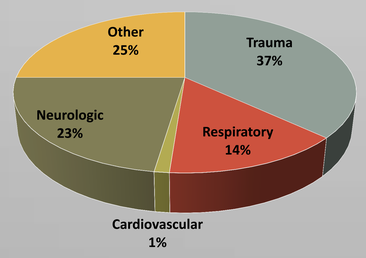
	Control (n=70)	Probiotics (n=70)
Age (years)	58	61.3
Sex	M (40%)	M (57%)
Apache* II Score (Median)	19	20
Admission type		
Medical	53	52
Surgical Elective	4	4
Surgical Emergency	13	14



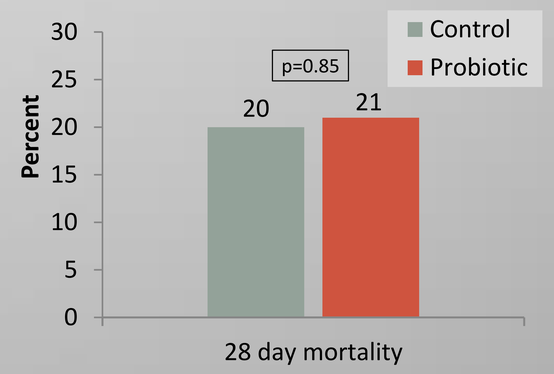
MICU patient admission types

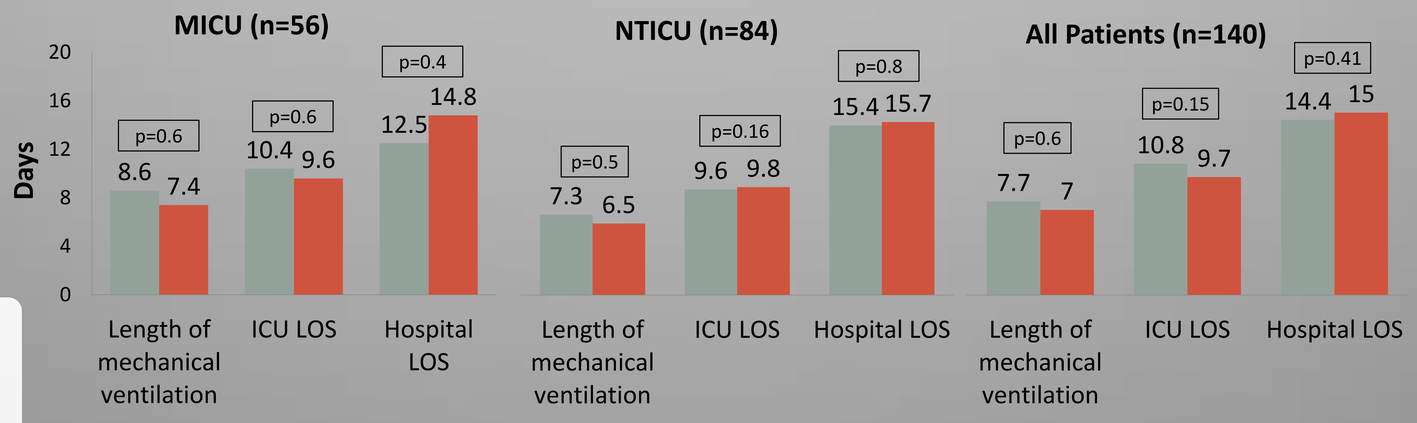


NTICU patient admission types



Patient Mortality





Discussion

Limitations

- Preliminary data
- Single center study
- Un-blinded, non randomized
- Single probiotic species
- Power not met

Outcomes

- No difference in duration of mechanical ventilation
- No difference in ICU and hospital LOS
- No difference in 28-day mortality

Conclusion

- Need more patients to detect difference in outcomes
- Possible clinically significant decrease in duration of mechanical ventilation (7.7 days in control versus 7.0 days in probiotic group)
- More studies needed using different probiotic species

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