American Journal of Clinical Nutrition, Vol. 85, No. 3, 816-823, March 2007




ORIGINAL RESEARCH COMMUNICATION

# Effects of probiotic therapy in critically ill patients: a randomized, double-blind, placebo-controlled trial[1,2,3]

Cathy Alberda[1], Leah Gramlich[1], Jon Meddings[1], Catherine Field[1], Linda McCargar[1], Demetrios Kutsogiannis[1], Richard Fedorak[1] and Karen Madsen[1]

[1] From the Royal Alexandra Hospital, Edmonton, Canada (CA, LG, and DK); the Department of Medicine, Division of Gastroenterology (LG, JM, RF, and KM), and the Department of Agricultural, Food, and Nutritional Science (LM), University of Alberta, Edmonton, Canada

Background: Multiple organ dysfunction syndrome (MODS) is a major cause of mortality in intensive care units. A breakdown in gut barrier function and immune dysfunction are associated with the onset of MODS. Probiotic bacteria have been shown to modulate intestinal barrier and immune function.

Objective: This study assessed the efficacy of a probiotic compound in a viable and nonviable formulation in modulating intestinal permeability and immune function and preventing the onset of MODS in patients in the intensive care unit.

Design: A double-blind, randomized controlled trial was conducted in the intensive care unit of a tertiary care teaching hospital. Twenty-eight critically ill patients admitted to the intensive care unit were randomly assigned to receive 1 of 3 treatments daily for 7 d: *1*) placebo, *2*) viable probiotics, or *3*) equivalent probiotic sonicates. MODS scores and systemic concentrations of immunoglobulin (Ig) A and IgG were measured on days −1, 4, and 7, and intestinal permeability measurements were taken daily.

Results: The patients responded to viable probiotics with a significantly larger increase in systemic IgA and IgG concentrations than in the patients who received placebo or sonicates ($P < 0.05$). MODS scores were not significantly affected by probiotic treatment. Over the study period, intestinal permeability decreased in most patients.

Conclusion: Patients receiving viable probiotics show a greater enhancement in immune activity than do patients receiving either placebo or probiotic bacterial sonicates.

Key Words: Intestine • multiple organ dysfunction syndrome • *Lactobacillus sp.* • *Bifidobacterium* • sepsis