Probiotics as dietary supplements in reversing malnourished conditions

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Abstract
Protein energy malnutrition is a potentially fatal body depletion disorder. The catastrophic effects of malnutrition include diarrhoea, malabsorption, increased intestinal permeability, reduced body weight and altered cytokine patterns affecting both regional and systemic immune responses thereby impeding host response to infections. Probiotics could serve as a weapon in ameliorating the immune response and gut dysbiosis conditions. Appropriate re-nutrition diet supplemented with probiotics could help restore most of the gastro-intestinal and immune functions, regenerate the intestinal mucosa and improve gut microbiota. The study evaluated the effect of a probiotic strain, L. reuteri LR6, during the re-nutrition process, as an adjuvant to restore the gut and systemic immune functions and its protective effect against a pathogenic strain infection in an immune-deficient PEM murine model. Several biomarkers linked to PEM viz., serum albumin, prealbumin (PAB), leptin, ghrelin, IL-1, C-reactive protein, TNF-α, production of cytokines IL-2, TNF-α involved in the regulation of the immune response, were studied. Using a metagenomic approach, differences between gut microbial communities obtained from malnourished and LR6 probiotic milk-fed PEM mice were studied. PEM mice model was developed successfully at protein, 2% and energy, 315.2 calories. Though the detrimental effects of malnutrition was reversed with nutrient repletion, probiotic milk administration was the most effective re-nutrition diet that modulated the intestinal microbiota and rejuvenated the gut mucosal conditions. Administration of probiotic milk as a dietary supplement during the re-nutrition process may serve as a good adjuvant in reversing the malnourished conditions.

Conclusion: The catastrophic effects of malnutrition, besides diarrhoea and malabsorption, is also due to increased intestinal permeability of the gut. Probiotics could serve as a weapon in ameliorating the immune response and gut dysbiosis conditions in humans. Administration of probiotic milk as a dietary supplement during the re-nutrition process may serve as a good adjuvant in reversing the malnourished conditions. Identification of biomarkers linked to Protein Energy Malnutrition (PEM) could pave the way for further research.

Biography:
Dr Ravinder Kumar Malik had his PhD from NDRI, Karnal, INDIA in 1982, respectively and Post-doc from Germany. Recipient of several Awards and Fellowships viz. FAO/UNDP Fellowship (USA), DST India/DIST Australia Fellowship, Visiting Professor Fellowship Award of Erasmus Mundus, EU; Honorary DAAD Advisor Award; Dr Dastur Award for Outstanding Research; Indo-NewZealand Joint project on Stabilization of probiotics with Riddet Institute, Massey University, New Zealand. Published over 132 research papers in National/International Journals; 2 books, 15 book chapters & 4 Manuals; three patents. Currently Emeritus Professor, Dr Malik has served as Joint Director (Research) at National Dairy Research Institute, Karnal, India.

Speaker Publications:
- Ravinder Kumar Malik et al; Optimization of Bacteriocin Production from Lactobacillus gasseri NBL 18 through Response Surface Methodology; March 2019.
- Ravinder Kumar Malik et al; Response surface optimization of the cultivation conditions and medium components for maximal reuterin production by L. reuteri BPL-36; Jul 2018.
- Ravinder Kumar Malik et al; Antagonistic Activity of Lactobacillus reuteri Strains on the Adhesion Characteristics of Selected Pathogens; March 2017.
- Ravinder Kumar Malik et al; Cell surface proteins play an important role in probiotic activities of Lactobacillus reuteri; Dec 2016.
- Ravinder Kumar Malik et al; Hypocholesterolaemic and probiotic effect of partially hydrolysed psyllium husk supplemented yoghurt; June 2016.

Healthcare and Pediatric Nutrition 2020

Abstract Citation:
Ravinder Kumar Malik; Probiotics as dietary supplements in reversing malnourished conditions; Healthcare & Nutrition 2020; June 22-23, 2020; Dubai, UAE.