

## Are Immunonutrition A Novel Therapy for Liver Diseases?

**Safeena Beevi SS\***

*Associate Professor, JNMC, College of Nursing, Aligarh Muslim University, Uttar Pradesh, India*

**\*Corresponding Author:** Associate Professor, JNMC, College of Nursing, Aligarh Muslim University, Uttar Pradesh, India.

**Received:** December 25, 2022; **Published:** December 31, 2022

DOI: 10.55162/MCMS.04.096

### Introduction

Liver disease itself profoundly affects level of nutrition and malnutrition is commonly observed in ESLD patients awaiting liver transplantation (LT) [1]. Malabsorption renders the cirrhotic patient unable to utilize the food taken completely. Malnutrition is a considerable challenge to control efficiently in cirrhotic patients, specifically as the liver disorder advances [2]. Clinical nutrition was focused on nutritional support in order to meet the patient's requirements and has been progressed to nutritional therapy planned as per the patient's medical diagnosis. Recently, physicians and nutritionists are giving more importance to immunonutrition and pharmaconutrition [3].

### Immunonutrition

Immunonutrition (or immunonutrient therapy) has the capacity to regulate the immune and inflammatory response by providing specific nutrients that is not usually ingested through the routine diet. Some specific nutrients have medicinal effects when consumed in significantly high doses [4]. Immunonutrients have influence on body's defense mechanisms and promotes immunity. They are the nutrients such as L-arginine,  $\omega$ 3/6 fatty acids, nucleotides, glutamine, amino acids containing sulphur [5].

### Roles of immunonutrient components

The roles of immunonutrient components are that arginine is known as a conditionally essential amino acid and accelerates T-cell mediated immunity. Omega -3 fatty acids decreases the inflammatory response and modify the production of cytokines and down-regulate inflammatory mediators and responses. It has got anti-thrombotic effect too. Nucleotides are the building blocks of RNA and DNA. It helps to maintain the gut barrier function and integrity of intestinal cells and promote immunity.

### Benefits of Immunonutrient therapy in Gastrointestinal diseases

Peri-operative immunonutrition might help to modify clinical outcome in patients undergoing transplantation of liver [6]. Few systematic reviews have reported that preoperative immunonutrition offered as nutritional addition to patients planned for elective gastrointestinal surgery results in substantial decrease in infections postoperatively [7-10]. Improvement has been exhibited in both undernourished [11] and normal nutritional status patients [12] and is assumed to be due to the down regulation of the inflammatory reaction to surgery and enhancement of the postoperative immune status.

In a study on effect of immunonutrition on inflammatory markers among gastric cancer patients who underwent gastrectomy showed that WBC, CRP and TNF- $\alpha$  levels were significantly decreased and IL-6, CRP, transferrin, albumin levels showed no significant change with immunonutrition. Early administration of enteral immunonutrition in post operative period helps to improve immunity and inflammatory reaction, thus reduces postoperative infectious complications [13].

Meta-analysis of randomized controlled trials on peri operative immunonutrient supplement with  $\omega$ -3 fatty acids, nucleotides and arginine had showed better outcomes in patients underwent LT [6]. In the last decade, many meta-analyses were done to identify the effect of immunonutrient on patient's outcome. A meta-analysis findings reported fish oil supplement helps to decrease the hospital stay and reduce post abdominal surgery infectious complications [14].

#### *Potentially benefitted patients with immunonutrient therapy based on many reported studies are patients*

- Underwent Gastrointestinal surgery,
- Head and Neck cancer
- Gastric cancer
- Patients receiving Chemotherapy
- Malnutrition
- Critically ill patients
- Elderly patients
- Severe acute Pancreatitis
- Chronic liver disease (CLD)/ End stage liver disease (ESLD) patients
- Listed/referred for liver transplant

Immunonutrition has shown to be beneficial in improving liver function [14, 15], decreases liver injury [16], enhances wound healing and decreases surgical wound complications [10] and as a nutritional intervention to enhance nutritional status [17] in liver disease patients.

#### **Conclusion**

Protein energy malnutrition is quite common among cirrhotic patients and malnutrition is a major complication adversely affects the clinical outcome. Hence, it is suggested that, early nutritional intervention with immunonutrients to patients with liver diseases are likely to be beneficial to prevent malnutrition and to enhance recovery.

#### **References**

1. Safeena Beevi and Biju Pottakkat. "Nutritional assessment and its clinical determinants among ESLD patients awaiting liver transplant". *Curr. Res. Nutr Food Sci Jour* 10.2 (2022): 790-801.
2. Chapman B., et al. "Malnutrition in cirrhosis: More food for thought". *World J Hepatol* 12.11 (2020): 883-896.
3. Prins A and Visser J. "Immunonutrition: A South African perspective". *South African Journal of Clinical Nutrition* 25.3 (2012): 94-111.
4. Grimble RF. "Nutritional modulation of immune function". *Proceedings of the Nutrition Society* 60.3 (2001): 389-97.
5. Grimble RF. "Basics in clinical nutrition: Immunonutrition - Nutrients which influence immunity: Effect and mechanism of action". *e-SPEN, the European e-journal of Clinical Nutrition and Metabolism* 4.1 (2009): e10-3.
6. Qiucheng Lei., et al. "Peri-operative immunonutrition in patients undergoing liver transplantation: A meta-analysis of randomized controlled trials". *Asia Pac J Clin Nutr* 24.4 (2015): 583-90.
7. Waitzberg DL., et al. "Post-surgical infections are reduced with specialized nutrition support - Nutrition for elective surgery". *World J Surg* 30.8 (2006): 1592-604.
8. Cerantola Y., et al. "Immunonutrition in gastrointestinal surgery". *British Journal of Surgery* 98.1 (2011): 37-48.
9. Marimuthu K., et al. "A meta-analysis of the effect of combinations of immune modulating nutrients on outcome in patients undergoing major open Gastrointestinal Surgery". *Ann Surg* 255.6 (2012): 1060-8.
10. Zhang Y., et al. "Perioperative immunonutrition for gastrointestinal cancer: A systematic review of randomized controlled trials". *Surg Oncol* 21.2 (2012): e87-95.

11. Braga M., et al. "Nutritional Approach in Malnourished Surgical Patients A Prospective Randomized Study". Arch Surg 137 (2002): 174-80.
12. Gianotti L., et al. "A randomized controlled trial of preoperative oral supplementation with a specialized diet in patients with gastrointestinal cancer". Gastroenterology 122.7 (2002): 1763-70.
13. Li K., et al. "Effect of Enteral Immunonutrition on Immune, Inflammatory Markers and Nutritional Status in Gastric Cancer Patients Undergoing Gastrectomy: A Randomized Double-Blinded Controlled Trial". Journal of Investigative Surgery 33.10 (2020): 950-9.
14. Chen B., et al. "Safety and efficacy of fish oil-enriched parenteral nutrition regimen on postoperative patients undergoing major abdominal surgery: A meta-analysis of randomized controlled trials". Journal of Parenteral and Enteral Nutrition 34.4 (2010): 387-94.
15. Badalamenti S., et al. "Renal Effects of Dietary Supplementation with Fish Oil in Cyclosporine-Treated Liver Transplant Recipients". Hepatology 22.6 (1995): 1695-701.
16. Calder PC. "Immunonutrition in surgical and critically ill patients". British Journal of Nutrition 98.1 (2007): S133-9.
17. Waitzberg DL., et al. "Post-surgical infections are reduced with specialized nutrition support - Nutrition for elective surgery". World J Surg 30.8 (2006): 1592-604.

**Volume 4 Issue 1 January 2023**

**© All rights are reserved by Safeena Beevi SS., et al.**