

Omega-3 fatty acids may benefit cancer patients undergoing major operations

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New research from Trinity College Dublin published in this month's *Annals of Surgery* points to a potentially significant advance in the treatment of patients undergoing major cancer surgery. The study was carried out by the oesophageal research group at Trinity College Dublin and St James's Hospital. A randomised controlled trial showed omega-3 fatty acids given as part of an oral nutritional supplement resulted in the preservation of muscle mass in patients undergoing surgery for oesophageal cancer, a procedure normally associated with significant weight loss and quality of life issues.

The trial was designed by Professor John V Reynolds, Professor of Surgery at Trinity College Dublin and St James's Hospital, Dublin, and Dr Aoife Ryan PhD, a research dietitian at St James's Hospital, Dublin*.

Omega 3 fats are essential fats found naturally in [oily fish](#), with highest concentrations in salmon, herring, mackerel, and sardines. Recently food manufacturers have begun to add omega 3 to foods such as yogurt, milk, juice, eggs and infant formula in light of a body of scientific evidence which suggests that they reduce [cardiovascular disease](#) risk, blood pressure, clot formations, and certain types of fat in the blood.

Previous studies had found that nutritional supplements containing one form of omega 3 fat, eicosapentaenoic acid (EPA), significantly reduced [weight loss](#) among inoperable cancer patients. The researchers hypothesised that a nutritional supplement rich in calories and a high dose of EPA would stem the debilitating weight loss seen in patients

following oesophageal surgery. The group chose to study patients undergoing surgery for oesophageal cancer as this surgery is one of the most stressful and serious operations a patient can undergo.

Professor John V Reynolds, Professor of Surgery at TCD and St James's Hospital and the lead researcher on the study said: "There are almost 450 new cases of oesophageal cancer diagnosed every year in Ireland and Ireland has one of the highest rates of oesophageal cancer in Europe. An increasing number of patients are treated with chemotherapy alone or in combination with radiation therapy before they undergo surgery. The surgery is a serious operation lasting several hours and can take weeks to recover from surgery and up to six months to recover pre-illness quality of life. Weight loss is extremely common both before and especially after this type of surgery, and any approach that can preserve weight, in particular muscle weight and strength, may represent a real advance".

In a double-blinded randomised control trial, the gold standard in medical research, patients awaiting oesophagectomy surgery were randomly assigned to treatment and control groups. While both groups received a 240ml nutritional supplement twice daily starting five days before surgery (which was identical in calories, protein, micronutrients and flavor), patients in the treatment group received an enriched formula with omega 3 (2.2 gram EPA/day). Immediately following surgery, the supplement was given through a feeding tube for 14 days while patients recovered in hospital. Once patients could resume oral feeding, they continued drinking the supplement until 21 days post surgery.

Results:

The oesophageal research group at Trinity College Dublin and St. James's Hospital found that patients given the standard feed (without omega 3) suffered clinically severe weight loss post surgery - losing an average of 4 lbs of muscle mass post surgery, where as in the omega 3

group patients maintained all aspects of their body composition

Commenting on the significance of the results, Dr Aoife Ryan said: "The results were extraordinary in the sense that no previous nutritional formulation had revealed such an outcome, with supplemented patients maintaining all aspects of their body composition in the three weeks following surgery. Patients given the standard supplement without omega 3 lost a significant amount of weight comprising 100% muscle mass. In fact 68% of patients suffered 'clinically severe' weight loss post surgery in the standard group (without omega 3) versus only 8% in the omega 3 group. The significant finding was that the patients did not lose just fat, as one would expect with weight loss, but instead they depleted their muscle stores significantly. Research has shown that a loss of 5lbs of weight produces significant effects on quality of life and a patient's ability to mobilise and perform simple activities of daily living. Losing 4 lbs of muscle is even more significant".

Professor John Reynolds said: "Omega 3 enriched nutrition appears to prevent loss of muscle mass by reducing the amount of inflammatory markers in the blood - this means the metabolism is not as stressed as it usually is post surgery. We also saw that the omega 3 group was less likely to have a fever in the first week post surgery which points to the ability of omega 3 to suppress inflammation. Looking at their blood tests omega 3 fed patients had much lower 'inflammatory compounds' circulating in their blood which points to the ability of omega 3 to reduce inflammation".

Using specialised nutritional feeds with a highly purified form of EPA, the researchers were able to administer a dose of omega 3 that was much higher than that typically found in food. They noted that treatment with omega 3 enriched supplement is only slightly more expensive than traditional nutritional therapy, and previous studies have yielded significant cost-savings in the form of fewer complications following

surgery using immuno-nutrition feeds similar to this. "Initial treatments like this may be cost-effective for our cash-strapped health care system", said Dr Ryan.

Commenting in an accompanying editorial in the *Annals of Surgery* Dr Michael Meguid, Professor of Surgery at State University of New York noted: "This study is a significant step forward because it underscores the message to surgeons of the importance of using omega 3 based nutrition as an adjunct therapy started at least 5 days before surgery. It should no longer be a surgeon's preference, but the standard of expected norm for the practice of elective complex gut [cancer surgery](#)".

In conclusion, Professor John Reynolds said: "This study has provided an interesting insight into how nutritional therapy can positively impact on the major stress of cancer surgery. More studies need to be done, in particular to address whether such approaches lead to more rapid recovery of quality of life, reduce complications, and improve outcomes. Throughout cancer care, many patients undergoing therapy nowadays have a combination of surgery, chemotherapy and radiation therapy, and studies addressing whether nutritional supplementation with omega 3 for the entire duration of treatment should be considered. Finally, we do not expect these findings are unique to cancer surgery, and similar benefits may accrue to patients needing complex surgical care for non-cancer problems, for instance liver transplantation or major cardiac surgery."

More information: Full title of the *Annals of Surgery* article: "Enteral Nutrition Enriched with Eicosapentaenoic acid (EPA) preserves lean body mass following esophageal cancer surgery: results of a double blinded randomized controlled trial". Authors: Aoife Ryan, John V Reynolds, Laura Healy, Miriam Byren, Jennifer Moore, Niamh Brannelly, Aisling McHugh, Deirdre McCormack, Philomena Flood.

Source: Trinity College Dublin

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