INPLASY PROTOCOL

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None declared.

Associations between omega-3 polyunsaturated fatty acids supplementation and surgical prognosis in patients with gastrointestinal cancer: a systematic review and meta-analysis

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Review question / Objective: Surgical resection remains the primary treatment for gastrointestinal (GI) cancer, omega-3 polyunsaturated fatty acids (n-3 PUFAs) have been reported to improve the prognosis of patients undergoing gastrointestinal tumor surgery. This meta-analysis aims to explore the efficacy of n-3 PUFAs on GI cancer patients undergoing surgery. P: the patients with gastrointestinal cancer; I: n-3 fatty acid supplementation during perioperative period; C: supplemental n-3 fatty acids are not given in the perioperative period, but other nutrients that are isonitrogenous and isocaloric are given; O: postoperative infectious complications , length of hospital stay, immune indicators: CD4(%), CD8(%), CD4/CD8; Inflammation indicators: Interleukin-6 (IL-6), Tumor Necrosis Factor-α (TNF-α), C-reactive protein (CRP); nutritional indicators: Prealbumin (PAB), Albumin (ALB),Retinol-binding protein (RBP). S: randomized controlled trials (RCTs).

INTRODUCTION

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gastrointestinal cancer; I: n-3 fatty acid supplementation during perioperative period; C: supplemental n-3 fatty acids are not given in the perioperative period, but other nutrients that are isonitrogenous and isocaloric are given; O: postoperative infectious complications , length of hospital stay, immune indicators: CD4(%), CD8(%), CD4/CD8; Inflammation indicators: Interleukin-6 (IL-6), Tumor Necrosis Factor-α (TNF-α), C-reactive protein (CRP); nutritional indicators: Prealbumin (PAB), Albumin (ALB),Retinol-binding protein (RBP). S: randomized controlled trials (RCTs).

Condition being studied: Due to the poor prognosis, the treatment of high-risk bladder cancer (HRBC) is still controversial. As an important essential fatty acid, n-3 PUFAs have received increasing attention from researchers. The research on n-3 PUFAs mainly focuses on the prevention and treatment of cardiovascular and cerebrovascular diseases, and n-3 PUFAs play an active role in nutritional support. Cardiovascular and cerebrovascular diseases through antithrombotic and vasodilatory mechanisms. It has been reported in the literature that n-3 PUFAs have positive effects on improving nutritional status, reducing inflammation, and enhancing immune function in cancer patients. However, other studies have shown that n-3 PUFAs do not improve nutritional status and clinical outcomes in cancer patients, and the impact of n-3 PUFAs on disease inflammation and nutritional status remains controversial. Considering that the findings and conclusions of these studies were not entirely consistent due to limited sample size, different study designs and potential bias, we intended to perform a meta-analysis of all relevant randomized controlled trials (RCTs) of n-3 PUFAs on gastrointestinal cancers. The nutritional status, inflammation and immune function of patients after surgery provide a theoretical basis for the clinical application of n-3 PUFAs in patients with gastrointestinal tumors.

METHODS

Participant or population: Patients with gastrointestinal cancer undergoing surgeryPreoperative nutritional support of n-3 polyunsaturated fatty acids in patients with gastrointestinal cancer.

Intervention: Preoperative supplementation of n-3 polyunsaturated fatty acids.

Comparator: Supplemental n-3 fatty acids are not given in the perioperative period, but other nutrients that are isonitrogenous and isocaloric are given.

Study designs to be included: Randomized controlled study.

Eligibility criteria: The studies were included in our analysis if they met the following criteria: (1) research design: randomized controlled trials; (2) participants: the patients with gastrointestinal cancer; (3) intervention measures: n-3 fatty acid supplementation during perioperative period; (4) outcomes: postoperative infectious complications, length of hospital stay, immune indicators: CD4(%), CD8(%), CD4/CD8; Inflammation indicators: Interleukin-6 (IL-6), Tumor Necrosis Factor-α (TNF-α), C-reactive protein (CRP); nutritional indicators: Prealbumin (PAB), Albumin (ALB),Retinol-binding protein (RBP).

Information sources: The search was conducted in PubMed, EMBASE and the Cochrane Registry of Controlled Trials (until December 2021) using various keyword combinations, The following key words were included: n-3 PUFAs, eicosapentaenoic acid or EPA, docosahexaenoic acid or DHA, gastrointestinal malignancy and cancer surgery. No language restrictions were applied, and original references containing text were also searched.

Main outcome(s): Postoperative infectious complications, immune indicators: CD4+ T cells, CD8+ T cell, CD4+/CD8+ T cell; inflammation indicators: interleukin-6 (IL-6),

tumor necrosis factor-α (TNF-α), c-reactive protein (CRP); nutritional indicators: prealbumin (PAB), albumin (ALB), retinol-binding protein (RBP).length of hospital stay.

Quality assessment / Risk of bias analysis: Quality assessment was performed by using the Cochrane bias-risk tool, which includes six domains: selection bias, performance bias, detection bias, attrition bias, reporting bias and other bias. The risk of each included study was rated as"high bias risk","unclear bias risk"or"low bias risk"according to the information extracted.

Strategy of data synthesis: The analysis of comparable data was conducted by Review Manager 5.3 (Cochrane Collaboration). We assessed the continuous outcomes using mean difference (MD) and dichotomous outcomes using the odds ratio (OR). We estimated the comparable data using 95% confidence interval (CI). The I2 test would be accounted to evaluate statistical heterogeneity. A random-effects model would be adopted for the result if the I2 >50%, otherwise, a fixed-effects model was chosen. P < 0.05 would be considered statistically significant.

Subgroup analysis: Subgroup analyses will be prespecified according to study population (children and adults),doses of supplementation (≤3 g/day and >3 g/day), duration (≤6 months and >6 months), and type of supplementation(DHA alone, EPA alone and the combination of EPA and DHA).

Sensitivity analysis: Sensitivity analyses will be performed by removing a single trial each time and repeating the meta-analyses to assess the reliability and stability of the pooled results.

Language: English.

Country(ies) involved: China.

Keywords: omega-3 fatty acids, gastrointestinal cancer, inflammatory response, immune function.

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