

INPLASY PROTOCOL

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Effect of Prehabilitation for Patients with Frailty Undergoing Colorectal Cancer Surgery: A Systematic Review and Meta-analysis

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Review question / Objective: We performed a meta-analysis to assess the impact of prehabilitation before colorectal surgery on functional outcome and postoperative complications in patients with frailty.

Condition being studied: Colorectal cancer is a common disease in the elderly, and over 65 years of age accounts for more than 50% of all patients with colorectal cancer. The patients with colorectal cancer surgery showed 8.7% major morbidity and mortality and 31.6% minor complications. The high complication rate of patients with colorectal surgery is related to the fact that there are many elderly patients. Frailty is common in elderly patients, and the frailty is associated with adverse perioperative outcomes. The frail patients with colorectal surgery showed worse postoperative morbidity, mortality and prolonged length of hospital stay. Although the frailty results from irresistible aging-associated decline in reserve and function across multiple physiologic systems, several attempts have been conducted to improve frailty in patients with colorectal cancer surgery and consequently improve the postoperative outcomes. Prehabilitation was one of these attempts for improving physical activity and postoperative outcomes on patients with frailty undergoing colorectal cancer surgery. So far, several studies conducted clinical trials for determining whether prehabilitation has positive effect on improving postoperative outcomes in patients with frailty undergoing colorectal surgery. However, the results of these previous studies are controversial.

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 21 November 2022 and was last updated on 21 November 2022 (registration number INPLASY2022110105).

INTRODUCTION

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over 65 years of age accounts for more than 50% of all patients with colorectal cancer. The patients with colorectal cancer surgery showed 8.7% major morbidity and mortality and 31.6% minor complications. The high complication rate of patients with colorectal surgery is related to the fact that there are many elderly patients. Frailty is common in elderly patients, and the frailty is associated with adverse perioperative outcomes. The frail patients with colorectal surgery showed worse postoperative morbidity, mortality and prolonged length of hospital stay. Although the frailty results from irresistible aging-associated decline in reserve and function across multiple physiologic systems, several attempts have been conducted to improve frailty in patients with colorectal cancer surgery and consequently improve the postoperative outcomes. Prehabilitation was one of these attempts for improving physical activity and postoperative outcomes on patients with frailty undergoing colorectal cancer surgery. So far, several studies conducted clinical trials for determining whether prehabilitation has positive effect on improving postoperative outcomes in patients with frailty undergoing colorectal surgery. However, the results of these previous studies are controversial.

METHODS

Participant or population: Patients with frailty.

Intervention: Prehabilitation.

Comparator: We compared the effects of prehabilitation with those of no prehabilitation.

Study designs to be included: The design of the studies to be included in this systematic review and meta-analysis was not specific and a full range of designs was considered. However, reviews, case reports, commentaries, letters, and animal studies were excluded.

Eligibility criteria: The detailed inclusion criteria for the network meta-analysis were studies that included the following: (1)

patients' age of ≥ 18 years; (2) diagnosis of colorectal cancer; (3) patients having frailty; (4) patients who received colorectal cancer surgery; (5) randomized and non-randomized trials comparing the effects of prehabilitation with those of no prehabilitation; (6) 6-minute walk test (6MWT), postoperative incidence of complications (Clavien–Dindo scale [CD] grade $\geq 3a$), Comprehensive Complication Index (CCI), or LOS to measure the hospitalization outcomes; and (7) written in English. Review articles, case reports, letters, and studies with insufficient data or results were excluded.

Information sources: Relevant articles were systematically searched using PubMed, EMBASE, Cochrane Library, and Scopus databases up to November 9, 2022.

Main outcome(s): 6MWT, incidence of complications, Comprehensive Complication Index (CCI) and length of hospital stay.

Quality assessment / Risk of bias analysis: Quality assessment of each study and level of evidence were established in accordance with the Grading of Recommendations, Assessment, Development, and Evaluation methodology. Bias assessment for each randomized trial was conducted using the risk of bias, which consisted of seven domains: random sequence generation, allocation sequence concealment, blinding of participants and personnel, blinding of outcome assessment, incomplete outcome data, selective outcome reporting, and other biases. The evaluated bias was expressed as “low risk,” “high risk,” or “unclear risk.” For non-randomized trials, the Newcastle-Ottawa Quality Assessment Scale was used for quality assessment with the following domains: selection of subjects, comparability of groups, and assessment of outcome. The quality of each non-randomized trial was graded as low (0-3), moderate (4-6), and high (7-9). These evaluations were conducted by two independent reviewers (MCC and YJC), and all disagreements were resolved through discussion between them.

Strategy of data synthesis: Two reviewers (MCC and YJC) independently extracted all data using a standard data collection form. If the designated outcome variables were unavailable or incomplete in the published articles, the corresponding authors were contacted for original data. The following data were collected for each eligible article: (1) name of the first author, (2) year of publication, (3) number of patients, (4) composition of prehabilitation, (5) duration of prehabilitation, (6) follow-up period, (7) clinical evaluation tools, and (8) results (6MWT, incidence of complications [CD grade $\geq 3a$], CCI, and LOS) extracted from the selected articles.

Subgroup analysis: N/A.

Sensitivity analysis: The studies were excluded one by one, and then the metaanalysis was performed in the remaining studies.

Language restriction: English.

Country(ies) involved: Republic of Korea.

Keywords: Prehabilitation; Frailty; Colorectal Cancer Surgery; Meta-analysis.

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