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Association between preoperative sarcopenia and prognosis of pancreatic cancer after curative-intent surgery: A updated systematic review and meta-analysis

Liu, CM¹; An, L²; Zhang, SY³; Deng, SQ⁴; Wang, N⁵; Tang, HJ⁶.**ADMINISTRATIVE INFORMATION****Support** - Shaoxing Basic Public Welfare Project (No. 2022A14012) and Shaoxing Health Science and Technology Project (Laboratory opening plan) (No. 2022SY013).**Review Stage at time of this submission** - Completed but not published.**Conflicts of interest** - None declared.**INPLASY registration number:** INPLASY202390060**Amendments** - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 18 September 2023 and was last updated on 18 September 2023.**INTRODUCTION**

Review question / Objective The aim of this meta-analysis is to identify the prognostic value of preoperative sarcopenia in patients with pancreatic cancer after curative-intent surgery.

Condition being studied Sarcopenia, an age-dependent reduction in skeletal muscle volume, was first described in 1989. Sarcopenia was a kind of progressive and widespread skeletal muscle disease associated with an increased likelihood of adverse outcomes, including falls, fractures, physical disability and death. It has been found to be a potential risk factor for morbidity and mortality in patients with gastrointestinal malignancies. Most patients with pancreatic cancer were prone to skeletal muscle depletion, leading to reduced tolerance for postoperative adjuvant therapy. Several recent studies have attempted to investigate the effect of sarcopenia

on the prognosis of pancreatic cancer, but the outcomes of these studies have been more or less controversial.

METHODS

Search strategy Database from PubMed, Embase and Web of Science were searched from its inception to July 2023.

Participant or population Patients with pancreatic cancer who underwent curative surgery.

Intervention None.

Comparator Overall survival, progression-free survival, and the incidence of overall, major, and surgical related complications.

Study designs to be included Observational studies (including prospective and retrospective studies).

Eligibility criteria Inclusion criteria were as follows: patients were pathologically diagnosed with pancreatic cancer; sarcopenia was evaluated by cross-sectional computed tomography scan of the third lumbar vertebra (L3) with respective cut-off values defined by sex before surgery; the measurement method of sarcopenia included skeletal muscle index (SMI) and psoas muscle index (PMI); the definition of cut-off values included various standards, such as receiver operating characteristic (ROC) curves, Martin's definition, Prado's definition and lowest quantile; outcomes were evaluated by prognostic indicators such as overall survival and/or progression-free survival and the incidence of postoperative complications.

Information sources Database from PubMed, Embase and Web of Science were searched from its inception to July 2023.

Main outcome(s) The primary outcomes were overall survival, progression-free survival, and the incidence of major complications (Grade III-IV) according to the Clavien-Dindo Classification.

Additional outcome(s) Secondary outcomes were the incidence of overall complications (Grade I-IV) according to the Clavien-Dindo Classification, as well as surgery-specific complications including clinically relevant postoperative pancreatic fistula, post-pancreatectomy hemorrhage, delayed gastric empty, and surgical site infection.

Quality assessment / Risk of bias analysis Two independent investigators assessed the quality of the included studies on the Newcastle-Ottawa Scale (NOS). The contents of the scale included case selection, cohort comparison and exposure risk assessment. Only studies with NOS score of six or higher were included in the final meta-analysis. In order to explore the possibility of publication bias, we applied funnel plots and Egger's test.

Strategy of data synthesis Survival data was calculated by hazard ratio and their 95% corresponding intervals in multivariate regression analysis, and categorical variables by odds ratio. The Cochrane's Q-test and I² statistics were used to assess statistical heterogeneity. The cut-off value of low, moderate, and high heterogeneity was 25%, 50% and 75%. When the value of total heterogeneity exceeded 50%, we used the random-effect model. Otherwise, the fixed-effect model was applied.

Subgroup analysis Subgroup analyses stratified by measurement approach of sarcopenia (skeletal mass index or psoas mass index), region of studies (Asia or non-Asia) and definition of cut-off values [ROC curves, Martin's definition, Prado's definition and lowest quantile] were performed further to find out the source of heterogeneity.

Sensitivity analysis We performed sensitivity analyses by excluding each study one by one.

Language restriction English.

Country(ies) involved China.

Keywords sarcopenia, pancreatic neoplasm, prognosis, meta-analysis.

Contributions of each author

Author 1 - Chenming Liu drafted and wrote the manuscript.

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