INPLASY PROTOCOL

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None declared.

Prognostic Impact of Myosteatosis in Patients with Gastric Cancers: A Systematic Review and Meta-Analysis

Jin, SB[1]; Jing, X[2].

Review question / Objective: **Myosteatosis may a better predictor than sarcopenia. Clinicians should strengthen the screening of myosteatosis in patients of GC and give active l support to improve the prognosis of patients.**
Eligibility criteria: **We assigned two authors independently to search for relevant studies and screen the literature using titles and abstracts. After the initial screening, the full text of the articles that satisfied the inclusion criteria were evaluated. In this study, we established following inclusion criteria: 1) adults diagnosed with GC. 2) The primary outcome for these studies include overall survival (OS) or/and disease free survival (DFS) with myosteatosis or radiodensity as one of the variables. 3) The decrease of HU was used as the diagnostic criterion for myosteatosis. The exclusion criteria were as follows: 1) case reports, reviews, conference abstracts or preclinical studies, 2) studies citing literature with incomplete data, and 3) nonhuman studies. If the same patient cohort was used in multiple studies, the latest and more complete data were adopted in this meta-analysis.**

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 07 June 2023 and was last updated on 07 June 2023 (registration number INPLASY202360024).

INTRODUCTION

Review question / Objective: **Myosteatosis may a better predictor than sarcopenia. Clinicians should strengthen the screening of myosteatosis in patients of GC and give active l support to improve the prognosis of patients.**

Condition being studied: **Gastric cancers (GC) is the most common cancer and it has tremendous impacts on population health. Some studies suggested myosteatosis may an independent factor for impacted the survival outcome of gastric cancers patients, however the result was still inconsistent. In this meta-analysis, we**

summarize the impact of myosteatosis on survival for GC.

METHODS

Search strategy: We investigated relevant studies from PubMed, Embase, the Cochrane library, and Web of Science up to November 31, 2022. Keywords used in our searches include the following: (myosteatosis) OR (muscle density) OR (muscle radiodensity) OR (muscle attenuation) OR (muscle strength) OR (intramuscular fat) OR (fat infiltration) OR (muscle quality) OR (muscle weakness) AND (Stomach Neoplasms) OR (Neoplasm, Stomach) OR (Stomach Neoplasm) OR (Neoplasms, Stomach) OR (Gastric Neoplasms) OR (Gastric Neoplasm) OR (Neoplasm, Gastric) OR (Neoplasms, Gastric) OR (Cancer of Stomach) OR (Stomach Cancers) OR (Gastric Cancer) OR (Cancer, Gastric) OR (Cancers, Gastric) OR (Gastric Cancers) OR (Stomach Cancer) OR (Cancer, Stomach) OR (Cancers, Stomach) OR (Cancer of the Stomach) OR (Gastric Cancer, Familial Diffuse). We manually verified for additional studies based on references used the retrieved articles.

Participant or population: Myosteatosis in Patients.

Intervention: Surgery with adjuvant radio/chemotherapy or radio/chemotherapy alone.

Comparator: Myosteatosis in Patients.

Study designs to be included: This study included three types of study designs, including cohort, case-controlled and cross-sectional studies.

Eligibility criteria: We assigned two authors independently to search for relevant studies and screen the literature using titles and abstracts. After the initial screening, the full text of the articles that satisfied the inclusion criteria were evaluated. In this study, we established following inclusion criteria: 1) adults diagnosed with GC. 2) The primary outcome for these studies include overall survival (OS) or/and disease free survival (DFS) with myosteatosis or radiodensity as one of the variables. 3) The decrease of HU was used as the diagnostic criterion for myosteatosis. The exclusion criteria were as follows: 1) case reports, reviews, conference abstracts or preclinical studies, 2) studies citing literature with incomplete data, and 3) nonhuman studies. If the same patient cohort was used in multiple studies, the latest and more complete data were adopted in this meta-analysis.

Information sources: We investigated relevant studies from PubMed, Embase, the Cochrane library, and Web of Science up to November 31, 2022.

Main outcome(s): Seventeen articles of 6296 patients. Pooled analysis indicated that myosteatosis was associated with OS (univariate: HR=1.934;95%CI [1.702-2.197]; P<0.001;I2=24.8%; multivariate: HR=1.579;95%CI[1.326-1.880];P<0.001; I2=51.4%) and DFS (univariate: HR=1.926;95%CI[1.559-2.379];P<0.001;I2=56.3%; multivariate: HR=1.512;95%CI [1.277-1.790];P<0.001;I2=38.3%)whether in univariate or multivariate. Sarcopenia also obtained similar conclusion but the DFS of multivariate have no predictive value. The result of myosteatosis had better stability. (The heterogeneity of univariate OS: myosteatosis 24.8% vs sarcopenia 52.5%; The heterogeneity of multivariate OS: myosteatosis 56.3% vs sarcopenia 86.5%).

Quality assessment / Risk of bias analysis: We explored possible publication bias through the use of Begg's funnel plot. The univariate analyses of OS (P=0.3) (Figure 10) and DFS (P=0.348) (Figure 11) did not indicate any publication bias. In contrast, the multivariate analysis of OS (P=0.016) hinted at a probable publication bias, owing to dissimilar studies excluding different confounding factors. We did not evaluate the multivariate analysis of DFS because of the inadequate number of studies included.

Strategy of data synthesis: Two authors from the included literature, compared the outcome data, and resolved conflicts

through discussion and consensus. The following information was extracted from these studies: last name, publication year, country of the patients, research type, number of patients (myosteatosis and sarcopenia), patient age, follow-up time, measurement location, measurement method, myosteatosis definition, Whether to underwent surgery or chemo-radiotherapy. When data could not be extracted, we used the Engauge Digitizer 10.8 software to extract survival data from the Kaplan-Meier curves. Following data extraction, meta-analysis was conducted using STATA software version 15.0 (Stata Corp, College Station, TX, USA) to combine the OS and DFS(19), and the outcomes were calculated according to the method described by Parmar(20). All statistical tests were bilateral, and a P value <0.05 was regarded as statistically significant.

Subgroup analysis: None.

Sensitivity analysis: The heterogeneity of the pooled results was assessed through Cochran's Q test and Higgins I-squared statistic. Random effects models were applied when significant heterogeneity was identified by I2>50%, otherwise fixed effects models were utilized. Begg's funnel plot and sensitivity analysis were used to assess publication bias.

Country(ies) involved: China.

Keywords: Myosteatosis, Sarcopenia, Body composition,Survival prognosis, Gastric Cancers.

Contributions of each author:

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