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Prevalence and Impact of Low Skeletal Muscle Mass Overall Survival in Hepatocellular Carcinoma Patients Treated with Transcatheter Liver-directed Intra-arterial therapies

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ADMINISTRATIVE INFORMATION

Support - Department of Internal Medicine, Dalin Tzu Chi Hospital, Buddhist Tzu Chi Medical Foundation.

Review Stage at time of this submission - Data analysis.

Conflicts of interest - None declared.

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Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 14 August 2023 and was last updated on 14 August 2023.

INTRODUCTION

Review question / Objective This systematic review and meta-analysis aimed to assess the outcome of low skeletal muscle mass (LSMM) in patients undergoing transarterial Liver-directed Intra-arterial therapies for hepatocellular carcinoma (HCC).

Condition being studied Sarcopenia is characterized by a decrease in skeletal muscle mass, quality, and strength. It is associated with an increased risk of adverse outcomes. Low skeletal muscle mass (LSMM) has been found to be a predictor of poor prognosis in HCC patients. There have been studies investigating the association between LSMM and three different transarterial embolization treatments (TACE, TAE, and TARE). However, their results have shown conflicting findings. Therefore, an updated review and meta-analysis are required to assess the impact of baseline LSMM on the prognosis of HCC patients undergoing a variety of transcatheter liver-directed intra-arterial therapies.

METHODS

Participant or population HCC patients who received transcatheter liver-directed intra-arterial therapies (such as TACE, TAE, or TARE treatment).

Intervention LSMM.

Comparator non-LSMM.

Study designs to be included cohort study.

Eligibility criteria Exclusion criteria: (1) Publication types other than the original articles; (2) Studies primarily focusing on hepatic tumors other than HCC; (3) Populations unrelated to LSMM or muscle mass; (4) Populations receiving therapy other than transcatheter liver-directed intra-arterial therapies; (5) Lack of statistical data concerning the impact of LSMM on OS (HRs and 95 percent CIs); and (6) Studies with patient data that was overlapped.

Information sources The PubMed and Embase databases were searched for studies investigating the association between LSMM and survival in HCC patients undergoing transarterial embolization until April 2023. We used free text searches with relevant MeSH or Emtree terms related to sarcopenia and liver cancer in these databases. Additionally, we manually searched the reference lists of relevant original studies and reviews for additional publications. There were no language restrictions for this search.

Main outcome(s) The prevalence of LSMM in intermediate-stage HCC patients and the impact of LSMM on their overall survival.

Quality assessment / Risk of bias analysis The Newcastle-Ottawa Scale was used to evaluate research quality.

Strategy of data synthesis The two authors independently extracted the following information: the first author's name, publication year, country, setting, number of patients, sex ratio, age, study design, treatment regimens, population, method used to estimate muscle mass, LSMM cutoff value, study period, and statistical data on the effect of LSMM on OS (including adjustment factors). We performed all calculations using Comprehensive Meta-Analysis version 4.0. Using a random-effects meta-analysis model, we compared the pooled OS between patients with and without LSMM by using the adjusted HR (or unadjusted HR for studies that did not report the adjusted HR) and 95% CI.

Subgroup analysis Subgroup analyses were performed on groupings derived by treatment options (TACE, TAE, or TARE), study region (Asian and non-Asian areas), and population age (>65 or < 65 years).

Sensitivity analysis To assess the robustness of the results of our main analyses, we conducted a sensitivity analysis using the leave-one-out meta-analysis.

Country(ies) involved Republic of China.

Keywords Hepatocellular carcinoma; transarterial embolization; transarterial chemoembolization; transarterial radioembolization; sarcopenia; survival; low muscle mass; meta-analysis.

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