INPLASY PROTOCOL

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Corresponding author:
Ke-Vin Chang

kvchang011@gmail.com

Author Affiliation:
Department of Physical Medicine and Rehabilitation, National Taiwan University Hospital, Bei-Hu Branch, Taipei, Taiwan.

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Conflicts of interest:
None declared.

Association of Sarcopenia and Sarcopenic Dysphagia with Tongue Strength: a Protocol for Systematic Review and Meta-analysis

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Review question / Objective: **To explore the association of tongue strength with sarcopenia and sarcopenic dysphagia.**
Condition being studied: **To explore the association of tongue strength with sarcopenia and sarcopenic dysphagia.**
Information sources: **A systemic literature search will be conducted in PubMed (US National Library of Medicine) and Embase (Wolters Kluwer Ovid) for observational, case control and cohort studies investigating tongue strength in participants with and those without sarcopenia. The reference lists or bibliographies of the available review articles and meta-analyses will be scrutinized for additional candidates. Case reports, case series, conference abstracts, animal studies or those performed in laboratory settings will be excluded from the present meta-analysis.**

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 19 February 2021 and was last updated on 19 February 2021 (registration number INPLASY202120060).

INTRODUCTION

Review question / Objective: **To explore the association of tongue strength with sarcopenia and sarcopenic dysphagia.**

Condition being studied: **To explore the association of tongue strength with sarcopenia and sarcopenic dysphagia.**

METHODS

Search strategy: **The combinations of the following keywords will be used for literature search, including skeletal muscle, sarcopenia, frailty, dysphagia, swallowing, tongue strength, tongue pressure.**

Participant or population: **Middle aged or old adults with or without sarcopenia.**

Intervention: Exposure: patients with sarcopenia.

Comparator: Non-exposure: controls without sarcopenia.

Study designs to be included: Cross-sectional, case-control, or cohort studies.

Eligibility criteria: The inclusion criteria include: (1) original research investigating the association of sarcopenia with dysphagia or swallowing function; (2) inclusion of middle aged or older adults; (3) with a clearly defined protocol to differentiate participants with and those without sarcopenia and (4) providing the measurement of tongue strength.

Information sources: A systemic literature search will be conducted in PubMed (US National Library of Medicine) and Embase (Wolters Kluwer Ovid) for observational, case control and cohort studies investigating tongue strength in participants with and those without sarcopenia. The reference lists or bibliographies of the available review articles and meta-analyses will be scrutinized for additional candidates. Case reports, case series, conference abstracts, animal studies or those performed in laboratory settings will be excluded from the present meta-analysis.

Main outcome(s): The weight mean difference and standardized mean difference of tongue strength between patients with and those without sarcopenia.

Additional outcome(s): The weight mean difference and standardized mean difference of tongue strength between patients with sarcopenic dysphagia and those with non-sarcopenic dysphagia.

Quality assessment / Risk of bias analysis: The Newcastle–Ottawa Scale (NOS) for cross-sectional studies will be utilized for methodological quality appraisal.

Strategy of data synthesis: The comparisons of tongue strength between patients with and those without sarcopenia or between patients with sarcopenic dysphagia and those with non-sarcopenic dysphagia will be quantified by using the weighted mean difference and standardized mean difference. The data pooling will be achieved by using the random effect model, considering differences of the patient population across the included studies. The potential existence of publication bias will be determined by the Egger's test and visual inspection of the distributions of the effect size on the funnel plot. A two-sided P value <0.05 is considered statistically significant and all the analyses will be implemented by using Comprehensive Meta-analysis Software v 3 (Biostat, Englewood, NJ).

Subgroup analysis: A subgroup analysis will be performed based on the difference on the swallowing function.

Sensitivity analysis: We will perform a sensitivity analysis to evaluate the influence of each study on the overall effect by eliminating them individually.

Language: No limitation of languages.

Country(ies) involved: Taiwan.

Other relevant information: The study will be made possible by (1) the research funding of the Community and Geriatric Medicine Research Center, National Taiwan University Hospital, Bei-Hu Branch, Taipei, Taiwan, (2) Ministry of Science and Technology (MOST 106-2314-B-002-180-MY3 and 109-2314-B-002-114-MY3) and (3) Taiwan Society of Ultrasound in Medicine.

Keywords: Sarcopenia, swallowing, dysphagia, tongue strength, tongue pressure.

Contributions of each author:
Author 1 - Ke-Vin Chang.