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INPLASY

The effect of β-Hydroxy-β-methylbutyrate supplementation on patients with sarcopenia: a systematic review and meta-analysis

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ADMINISTRATIVE INFORMATION

Support - None.

Review Stage at time of this submission - Formal screening of search results against eligibility criteria.

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 22 January 2024 and was last updated on 22 January 2024.

INTRODUCTION

Review question / Objective Our aim was to undertake a systematic review and meta-analysis to examine the effects of HMB supplementation in patients with sarcopenia.

Rationale β-hydroxy-β-methylbutyrate (HMB), a leucine metabolite, has been shown a mechanism of stimulating muscle protein synthesis and decreasing protein degradation, which may be approved for use in foods for special medical purpose (FSMP), or a candidate for a new metabolic treatments for muscle health. Although RCTs are being developed to evaluate the effects of HMB supplementation in patients with sarcopenia, given the absence of meta-analyses, there is currently insufficient evidence to recommend HMB supplementation in patients with sarcopenia in clinical practice.

Condition being studied Sarcopenia is a progressive and generalized skeletal muscle disorder involving the accelerated loss of muscle mass and function that is associated with adverse outcomes including falls, functional decline, frailty, and mortality.

METHODS

Search strategy We performed a literature search in the database of PubMed, MEDLINE, Web of Science, EMBASE, CINAHL, Scopus, China Wanfang Literature Database, China National Knowledge Infrastructure (CNKI) and VIP Chinese Science and Technology Periodicals Database. Additional searches were conducted in ClinicalTrials.gov (https://www.clinicaltrials.gov), World Health Organization (WHO) International Clinical Trials Registry Platform (https://trialsearch.who.int/) and Chinese Clinical Trial Registry (https://www.chictr.org.cn) in order to collect data for corresponding RCTs which don't publish papers. We also looked for relevant articles cited in review articles, commentaries, editorials,

and in the references of the original articles identified by our search.
We used the following index keywords: “beta-hydroxy-beta-methylbutyrate”, “β-hydroxyβ-methylbutyrate”, “β-hydroxy-β-methylbutyrate”, “b-hydroxy b-methylbutyrate”, “b-hydroxy-b-methylbutyrate”, “3-hydroxy 3-methylbutyrate”, “3-hydroxy-3-methylbutyrate”, “HYDROXY METHYLBUTYRATE”, “HYDROXYMETHYLBUTYRATE”, “HMB”, “β-Hydroxyβ-methylbutyric acid”, “β-Hydroxy-β-methylbutyric acid”, “b-hydroxy b-methylbutyric acid”, “b-hydroxy-b-methylbutyric acid”, “CaHMB” and “Sarcopenia”.

Participant or population Patients diagnosed with sarcopenia.

Intervention β-hydroxy-β-methylbutyrate.

Comparator No-treatment control, or placebo product.

Study designs to be included Randomized controlled trials.

Eligibility criteria Protocol or abstract, not report data of trails, was excluded.

Information sources PubMed, MEDLINE, Web of Science, EMBASE, CINAHL, Scopus, China Wanfang Literature Database, China National Knowledge Infrastructure (CNKI) and VIP Chinese Science and Technology Periodicals Database. Additional searches were conducted in ClinicalTrials.gov (https://www.clinicaltrials.gov), World Health Organization (WHO) International Clinical Trials Registry Platform (https://trialsearch.who.int/) and Chinese Clinical Trial Registry (https://www.chictr.org.cn).

Main outcome(s) Muscle mass and strength, and physical performance.

Quality assessment / Risk of bias analysis Risk of bias was assessed independently by two investigators according to the Version 2 of the Cochrane tool for assessing risk of bias in randomized trials (RoB 2). The risk-of-bias judgments are “low risk of bias,” “some concerns,” or “high risk of bias”, which based on, and summarize the answers to signalling questions within five distinct domains respectively (i.e. bias arising from the randomization process, deviations from intended interventions, missing outcome data, measurement of the outcome, selection of the reported result).

Strategy of data synthesis Meta-analyses of continuous outcomes were performed on the extracted data. Standard mean difference (SMD) with 95% confidence intervals (CIs) between treatment and control group were used to express intervention effect estimates.

Subgroup analysis None.

Sensitivity analysis Sensitivity analyses were also conducted for all outcomes by the “remove 1” technique. Such a procedure aimed to assess whether individual studies had a disproportionate effect on the results of the meta-analyses.

Language restriction None.

Country(ies) involved China.

Keywords β-Hydroxy-β-methylbutyrate; HMB; Sarcopenia; Muscle; Meta-analysis.

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