Beta-hydroxy-beta-methylbutyrate free acid improves resistance training-induced muscle mass and function: a systematic review

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Citation

Review question(s)
What is the effect of HMB-FA on resistance training-induced muscle mass and function?

Searches
A literature search was performed in PubMed and the Google academic databases.

In addition, a manual search of the literature was also performed.

The search was restricted to research conducted on humans and published in the English language only.

Types of study to be included
Randomized and placebo-controlled studies and two-arm studies conducted on humans only.

Condition or domain being studied
HMB is a leucine metabolite, described as a potent nutritional supplement, which has effects on muscle recovery and tissue damage, strength and lean body mass. In addition, HMB plays an anti-catabolic effects.

Participants/ population
Randomized, placebo-controlled and two-arm studies (with humans only) that analyzed the effects of HMB on exercise training were considered eligible.

Intervention(s), exposure(s)
We will evaluate articles that investigated HMB supplementation effects on resistance training.

Exclusion criteria were: subjects with chronic diseases involving patients with overweight-induced metabolic consequences.

Inclusion criteria were: men and women subjected to exercise protocols.

Comparator(s)/ control
Studies comparing the effects of HMB supplementation with placebo in subjects who were subjected to acute or exercise training.

Outcome(s)
Primary outcomes
Effects on skeletal muscle in sedentary, active and recreationally-trained subjects and HMB-supplemented compared with placebo.

Change in lean mass from baseline to final intervention.

Change in strength and biochemical parameters from baseline to final intervention.
Secondary outcomes
None.

**Data extraction, (selection and coding)**
Two authors independently evaluated all published studies relating to HMB and exercise by assessing titles and abstracts. The full texts of any potentially relevant articles published in the two abovementioned databases (PubMed and Google academic databases) were then assessed for inclusion, and any disagreements regarding eligibility were resolved by debate.

**Risk of bias (quality) assessment**
Two systematic review authors assessed the risk of bias in included studies by considering the following characteristics:

- Quality of randomisation: by age and training status.
- Study controls: with placebo.
- Blinding: was there sufficient blinded to the intervention allocation?
- Summary tables: checked with the latest trial report by the third review author.

In addition, disagreements between the two reviewers authors over risk of bias were resolved by discussion, with the involvement of a third review author.

**Strategy for data synthesis**
We will provide a narrative synthesis of the findings from the included studies, structured around of the HMB intervention, target population characteristics and exercise type. We will provide summaries of intervention effects with HMB on resistance training-induced muscle mass and function for each study.

**Analysis of subgroups or subsets**
None planned.

**Dissemination plans**
A paper will be submitted to a leading journal in this field.

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Conflicts of interest
None known

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Stage of review
Ongoing

Date of registration in PROSPERO
28 June 2016

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