Letter to editor

Cross talk between gut microbiome and skeletal muscle mass

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Dear Editor-in-Chief

The topic of the interaction between gut microbiota and skeletal muscle and its influence on the regulation of muscle mass is new. There is evidence that the composition and diversity of gut microbiota plays a role in skeletal muscle metabolism and function, especially in catabolic (sarcopenia and cachexia) or anabolic (exercise or in athletes) situations. Signals generated by gut-microbiota interactions, such as microbial metabolites, gut peptides, lipopolysaccharides, and interleukins, modulate systemic inflammation and insulin sensitivity, which in turn regulate muscle function.

Potential mechanisms by which the gut microbiota can affect muscle mass suggest that it can regulate the sensitivity of skeletal muscle to anabolic stimuli and contribute to the reduction or increase of muscle mass depending on the physiological state.

In addition, the use of probiotic strategies to prevent muscle mass loss or promote muscle mass gain in catabolic or anabolic states may be helpful. Probiotics, particularly lactic acid bacteria and bifidobacteria, have shown potential in limiting sarcopenia, cachexia, or promoting muscle health and function in rodent studies. However, more research is needed to identify specific strains that can optimize muscle mass and performance in humans (Chew et al., 2023).

Overall, this line of research suggests that a combination of strategies, including probiotics, personalized nutrition, and traditional supplementation, may be the best approach to maintaining muscle function in people of all ages. However, further studies are needed to better understand the role of gut microbiota in muscle metabolism and to identify optimal probiotic strategies for muscle health.

Researchers in this field also discuss challenges in studying the effects of probiotics on muscle mass and function, including variations in study design, participant characteristics, and measurement methods. They suggest future research directions, such as investigating the use of strict anaerobic bacteria and a mixture of probiotics or fecal microbiota transplantation (FMT) to more efficiently colonize the host's microbial ecosystem. In addition, they suggest the combination of probiotic strains with other nutritional agents to optimize their effects on the microbiota and muscles (Gizard et al., 2020).

Consequently, while probiotics have shown promising effects on muscle mass and performance in animal studies, their efficacy in humans remains unclear. Further research is needed to determine specific strains and protocols that can effectively modulate gut microbiota and improve muscle health in different populations.

References

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