

# Effects of ashwagandha (*Withania somnifera*) on vo2max: A systematic review and meta-analysis

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The purpose of this study was to systematically review the scientific literature about the effects of supplementation with Ashwagandha (*Withania somnifera*) on maximum oxygen consumption (VO<sub>2</sub>max), as well as to provide directions for clinical practice. A systematic search was conducted in three electronic databases following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Guidelines (PRISMA). The inclusion criteria were: (a) VO<sub>2</sub>max data, with means  $\pm$  standard deviation before and after the supplement intervention, (b) the study was randomized controlled trial (RCT), (c) the article was written in English. The quality of evidence was evaluated according to the Grading of Recommendations, Assessment, Development and Evaluation (GRADE) approach. A meta-analysis was performed to determine effect sizes. Five studies were selected in the systematic review (162 participants) and four were included in the meta-analysis (142 participants). Results showed a significant enhancement in VO<sub>2</sub>max in healthy adults and athletes ( $p = 0.04$ ). The mean difference was 3.00 (95% CI from 0.18 to 5.82) with high heterogeneity. In conclusion, Ashwagandha supplementation might improve the VO<sub>2</sub>max in athlete and non-athlete people. However, further research is need to confirm this hypothesis since the number of studies is limited and the heterogeneity was high. © 2020 by the authors. Licensee MDPI, Basel, Switzerland.

Ergogenic aids

Maximum oxygen consumption

Performance sports

Physical fitness

adult

aerobic capacity

article

athlete

controlled study

effect size

female

fitness

human

human experiment

male

meta analysis

nonhuman

Preferred Reporting Items for Systematic Reviews and Meta-Analyses

randomized controlled trial (topic)

scientific literature

systematic review

Withania somnifera