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Effect of acute and chronic exercise in hypoxia combined with nitrate supplementation on the performance of athletes: a review

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Introduction

Athletes and performance

- Performance optimizer (1)
- Low availability of oxygen (hypoxia)
- Specific muscular adaptations (2)

- Nutritional ergogenic
- Precursor for nitric oxide (NO)
- NO_3^- → nitrite (NO^{2-}) → NO
- Accentuated effect in hypoxia (3)

Objectives

The aim was to review the effect of acute and chronic exercise in hypoxia combined with nitrate supplementation on the performance of athletes.

Methods

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2010 - 2020

Reviews
Meta-analyzes
Animal studies
Inacessible full text
Without NO^{3-}
Without adequately assessed performance

Exposure to hypoxia combined with NO_3^- supplementation:

Acute: 13 articles
Chronic: 2 articles

Results

Acute effect of both strategies combined

7 studies: NO_3^- attenuated the effects of hypoxia exposure (4,5,6,7,8,9,10)

6 studies: Did not evidenced improvements in performance (11,12,13,14,15,16)

Chronic effect of both strategies combined

↑ type IIa muscle fibers in sprint interval training: ↑ performance in short maximal exercise (17)

Endurance performance was unchanged after 5-6 weeks (17,18)

Conclusion

Considering the contradictory data and limitations found, further studies are needed to better understand the effect of acute and chronic exercise in hypoxia combined with nitrate supplementation on the performance of athletes.

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