

長距離走選手を対象とした低強度かつ低頻度での低酸素トレーニングの効果 ーレース前の調整期に行った4週間のトレーニング事例ー

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キーワード: 長距離走, 高所トレーニング, 低酸素トレーニング, 常圧低酸素室

[概要]

大学生の男子長距離走選手6名を対象として, 駅伝大会の直前の4週間にわたり, 低地での通常トレーニングに加えて, 週に2回, 1回あたり90分間(主運動は実質40分間)の低酸素トレーニングを行った. このトレーニングは常圧低酸素室内で行い, 高度は各選手の体調に合わせて2000~2800m相当(酸素濃度:16.4%~14.9%)に設定した. 主運動はトレッドミル走とし, 主観的運動強度が13(ややきつい)となる速度に調節した. その結果, トレーニング後には, 5000m走のレース速度における血中乳酸濃度と主観的運動強度とが全員で低下し, その変化は統計的にも有意であった. また有意な変化ではなかったが, 酸素摂取量や換気量が大きく低下した選手も一部では見られた. 一方, 赤血球やヘモグロビンといった血液性状には共通した変化は見られなかった. 以上の結果から, 週に2回という低頻度かつ低強度での低酸素トレーニングであっても, 血中乳酸濃度を中心とする生理指標の改善によって, 長距離走のパフォーマンスを向上させられる可能性が考えられた.

スポーツパフォーマンス研究, 3, 31-48, 2011年, 受付日:2010年3月16日, 受理日:2011年3月4日
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Effects of low intensity, low frequency hypoxic training on the performance of long-distance runners: Four weeks of training prior to a race

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Key Words: long-distance race, high-altitude training, hypoxic training,
normobaric hypoxic chamber

[Abstract]

The participants in the present study were six university students who were long-distance runners. For four weeks prior to an ekiden (long-distance relay

running race), they received hypoxic training twice a week for 90 minutes (40 minutes was the main exercise effect), in addition to regular training in the lowlands preceding the race. The hypoxic training was conducted in a normobaric hypoxic chamber in which the altitude was set to 2000-2800 meters or equivalent (oxygen concentration: 16.4% - 14.9%), according to each runner's physical condition. The main exercise was done on a treadmill that had the subjective exercise intensity adjusted to 13 of Borg's scale (moderate speed). Following this training, the blood lactate concentration and subjective exercise intensity after running at speeds typical of a 5000-meter race decreased for all runners; the decrease was statistically significant. Moreover, oxygen uptake and ventilation volume appeared to be greatly reduced in some participants, although the observed change was not statistically significant. Meanwhile, changes typically found in runners' blood characteristics, such as the number of red blood cells and amount of hemoglobin, were not seen. These results suggest that, even if low intensity hypoxic training is done as seldom as twice a week, it may be possible to improve the performance of long-distance runners because of improved physiological parameters as measured by blood lactate levels.