

# スポーツウェアの材質・機能の違いが非定常負荷運動時の生理応答に与える影響

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## Effects of Materials and Functions of Sports Clothes on Physiological Response during Unsteady Workload Exercise

by

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### ABSTRACT

The purpose of this study was to determine the heart rate (HR), the blood pressure (BP) and the oxygen uptake responses in wearing sports clothes with compression and gradation during unsteady workload exercise. Volunteering to participate in this study were 18 healthy Japanese males, who gave their informed consent prior to participation. Each subject performed cycling exercise for 32 min, and recovered for 10 min in the supine position. They performed the exercise in two portions, a calibration test portion

and gradual increase and decrease of workload exercise test portions. The calibration test consisted of three 4min bouts of exercise at 20, 60 and 40% of maximum oxygen uptake. The gradual increase and decrease of workload exercise test consisted of 4min bouts of gradual increase and decrease of workload exercise at between 20 and 60% of maximum oxygen uptake. The experimental conditions were control condition (C-condition) and wearing sports clothes in compression and gradation condition (CG-condition). HR, BP, oxygen uptake were measured in both experiments. Maximal and minimal values, amplitude and phase lags at workload top and bottom were measured in each gradual increase and decrease of workload exercise cycle. At rest, physiological markers showed no significant difference in either condition. HR at 60% and top of workload in the CG-condition was significantly lower than in the C-condition ( $p < 0.05$ , respectively). At 20%, 40% and bottom workload, however, HR showed no significant difference in either condition. The phase lags to the top the workload in the CG-condition was significantly shorter than on the C-condition ( $p < 0.05$ ). However, phase lags to the bottom of the workload showed no significant difference in either condition. BP, oxygen uptake and double product showed no significant difference in either condition. These data suggest that the sports clothes in compression and gradation acts as an advantage of the relative exercise intensity decrease in moderate bicycle exercise.

## 要 旨

本研究は、段階的着圧機能を有するスポーツウェアの着用が非定常負荷運動中の生理指標に及ぼす影響を明らかにした。健康な成人男性18名を対象に自転車運動を実施した。運動は、定常負荷運動（最大酸素摂取量の20%、60%、40%）と非定常負荷運動（最大酸素摂取量の20-60%強度における漸増漸減負荷運動）とした。測定条件は、段階的着圧ウェアを着用する条件と着用しない条件とした。測定項目は、心拍数、血圧、酸素摂取量とした。漸増漸減負荷運動の心拍数、酸素摂取量の最高値、最低値、位相の遅れ時間、振幅割合を算出した。その結果、段階的着圧ウェアの着用が安静時と運動後回復期の生理指標に及ぼす影響は小さいが、定常負

荷運動（60%）、漸増負荷局面の心拍数を有意に減少させ、位相の遅れ時間を有意に短縮させることがわかった。この応答は、低強度運動においては観察されなかった。以上の結果より、段階的着圧機能を有するスポーツウェアの着用は、中等度の自転車運動において相対的な運動強度減少の利点として作用するものと考えられる。