The Relationship among Body Composition, Anaerobic Power, Lactate Threshold and Maximal Oxygen Consumption in Male Soldiers

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Context: Suboptimal levels of body composition, anaerobic power, lactate threshold, and maximal oxygen consumption have been directly linked to an increased risk of injury and impaired performance as premature fatigue results. However, the relationships among these parameters in a military population have not been studied and may vary depending on occupational demands. **Objective:** To determine whether a significant relationship exists among body composition, anaerobic power, lactate threshold, and maximal oxygen consumption in male soldiers of Army 101st Airborne when stratified according to the Military Occupation Specialty's Physical Demand Ratings (PDR). **Design:** Descriptive cross-sectional study design. **Setting:** University sports medicine laboratory. **Participants:** Forty healthy 101st Airborne (Air Assault) soldiers (29 ± 6.8 yrs, 184 ± 25.9 cm, 70 ± 2.3 kg) participated. They were grouped according to PDR by moderate (n = 8), moderately heavy (n = 7), and very heavy (n = 25). **Interventions:** The subjects were tested on two separate days. Body composition was measured with an air-displacement plethysmography device, and Wingate cycle ergometer protocol was used to measure peak and mean anaerobic power. An incremental ramp protocol was used to capture maximal oxygen consumption and lactate threshold. **Main Outcome Measures:** Body composition (BC) was measured in percentage of body fat. Peak and mean anaerobic power (PNAP and MNAP) were measured in Watts and normalized to body weight (Watt/kg). Maximal oxygen consumption (VO_2max) was measured in milliliter per kilogram per minute (ml/kg/min). Lactate threshold was calculated in percentage of maximal oxygen consumption ($LTVO_2$). **Results:** For soldiers with PDR of moderate, PNAP was significantly correlated to MNAP ($r = .766$, $p = .027$) and VO_2max ($r = .853$, $p = .031$). For soldiers with PDR of moderately heavy, BC was significantly correlated to MNAP ($r = -.800$, $p = .031$) and VO_2max ($r = -.825$, $p = .022$). MNAP was significantly correlated to VO_2max ($r = .774$, $p = .041$) and $LTVO_2$ ($r = -.931$, $p = .002$). For soldiers with PDR of very heavy, BC was significantly correlated to MNAP ($r = -.532$, $p = .007$) and VO_2max ($r = -.665$, $p = .001$). MNAP was significantly correlated to PNAP ($r = .786$, $p < .001$) and VO_2max ($r = .614$, $p = .002$). **Conclusions:** There were selected relationships among body composition, anaerobic power, lactate threshold, and maximal oxygen consumption in male soldiers of Army 101st Airborne when stratified according to their PDR. However, not every group shared the same relationships among variables. Despite similar grouping, the specific demands within a group may vary and account for the different demonstrated relationships between groups. Future studies should focus on determining the causes of such differences. **Word Count:** 435