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Effects of Wearing a Surgical Mask During Moderate Exercise on Muscle and Blood Oxygen Saturation

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The rise in use of surgical masks to prevent COVID-19 infections has led to questions concerning their impact on performance during sport and exercise. Currently, there is a paucity of literature on the effects of mask-wearing on oxygen levels in the body during exercise, which are critical for optimal aerobic exercise performance. Moreover, no studies to date have addressed the implications of mask-wearing during moderate intensity exercise in a field setting in a fit, college-age population. **PURPOSE:** To determine if mask-wearing during moderate intensity aerobic exercise affects blood oxygen and muscle oxygen saturation levels compared to equal activity when not wearing a surgical face mask in college athletes. **METHODS:** Six subjects (3 males and 3 females; 20 ± 2 yrs) were randomized to perform a moderate-intensity 1-mile run either with a mask (M) or unmasked (U) on an outdoor track. Subjects performed a guided warm-up, then began run with instructions to remain within maximum heart rate (HR) range of 64-76%. Blood oxygen saturation (SpO_2 , measured with pulse oximeter), muscle oxygen saturation (SmO_2 , measured with near-infrared spectroscopy), and HR (measured with heart rate monitor) were assessed at 3 separate times during the exercise protocol – after donning monitors, after warm-up, and after run. Maximal oxygen consumption ($\dot{V}O_2$ max) was estimated using prediction equation described by George et al. Results were analyzed using a one-way ANOVA with repeat measures. **RESULTS:** No differences were seen for SmO_2 ($M=62 \pm 17.6$, $U=66.0 \pm 2.8$; $p>0.05$), SpO_2 ($M=98.3 \pm 0.6$, $U=98.3 \pm 0.6$; $p>0.05$) or HR ($M=160.7 \pm 16.0$, $U=128.0 \pm 19.0$; $p>0.05$) between the groups at the end of the exercise protocol. Additionally, no differences were seen in predicted $\dot{V}O_2$ max ($M=37.7 \pm 1.9$, $U=48.0 \pm 5.9$; $p>0.05$) between groups. **CONCLUSION:** Wearing a surgical mask during moderate exercise had no detrimental effects on blood or muscle oxygenation in college-age participants in a real-world setting.