TACSM Abstract -

Energy Expenditure following Acute Cold Exposure

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ABSTRACT

Whole body energy expenditure (i.e., RMR) increases during acute cold exposure. Whether this increase in energy expenditure persists in the post-cold term in humans due to non-shivering thermogenesis has not yet been evaluated. Therefore we tested the hypothesis that RMR would be different directly following acute cold exposure. RMR ($kcal \bullet min^{-1}$) was assessed via indirect calorimetry on eight (8) males and seven (7) females at six time points: prior to cold exposure (T1), at the end of 30 minutes of cold exposure (T2), immediately post-cold-post-shivering (T3), at 35 minutes post-cold (T4), at 75 minutes post-cold (T5), and at 115 minutes post-cold (T6). This RMR data for the aforementioned time points was analyzed using paired, dependent t-tests and one way ANOVA; the significance level was placed at $p < 0.05$. The RMR data for each time point was as follows: T1 (1.19±0.21), T2 (2.30±0.94), T3 (1.37±0.25), T4 (1.12±0.19), T5 (1.14±0.22), and T6 (1.14±0.22). The analysis of the RMR data showed a significant difference between the cold (T2) data and all other time points (T1, T3, T4, T5, and T6). Additionally there was a significant difference between the pre-cold (T1) and the immediately post-cold (T3) data. However there was no significant difference between the pre-cold (T1) data when compared with the remaining post-cold data (T4 – T6). These results suggest that the human body is capable of returning RMR to baseline levels relatively immediately following the cessation of acute cold exposure.