INTRODUCTION

• It is well known that prolonged stays at altitude will decrease body mass.
• This decline is attributed to an increase in basal metabolic rates, reduction of food intake, impairments in protein synthesis, and potential changes in gene expression from hypoxia.
• Recent literature suggests simulating high altitude through normobaric hypoxia is physiologically different from hypobaric hypoxia.
• It is unknown, however, if these differences extend to the cellular level within skeletal muscle tissue.
• Myogenic and proteolytic responses to these different forms of hypoxia may give insight into potential physiological differences.
• The purpose of this research was to determine the differences in key myogenic and proteolytic gene expression between hypobaric and normobaric hypoxia.

METHODS

• 8 recreationally trained male and 7 recreationally trained female subjects completed 3 trials in a randomized, counter-balanced order.
• Subjects cycled for 1 hr on an electronically braked cycle ergometer (Velotron, RacerMate, Seattle, WA) followed by 4 hours of recovery at simulated altitudes.
• Recovery altitudes consisted of ambient conditions (975 m), hypobaric hypoxia (4,420 m), and normobaric hypoxia (4,420 m).
• Participants rested supine in an altitude tube (Engineering Innovations, LLC, Littleton, CO) capable of lowering the barometric pressure.
• The altitude tube was located inside a hypoxic chamber (Tescor, Warminster, PA) capable of lowering the percentage of oxygen in the air.
• Muscle biopsies were taken from the vastus lateralis before exercise and after each recovery period for analyses of myogenic and proteolytic gene expression.

RESULTS

Table 1. Participant descriptive data (n = 15)

<table>
<thead>
<tr>
<th>Age (y)</th>
<th>Height (cm)</th>
<th>Weight (kg)</th>
<th>Body Fat (%)</th>
<th>VO2 Peak (L·min⁻¹)</th>
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<tr>
<td>24 ± 4</td>
<td>178 ± 12</td>
<td>72.47 ± 13.84</td>
<td>14 ± 7</td>
<td>3.6 ± 0.8</td>
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Data are mean ± SD.

CONCLUSIONS

• Hypobaric and normobaric hypoxia recovery from aerobic exercise does not affect myogenic and proteolytic gene expression with the exception of a modest attenuation of myostatin in hypobaric hypoxia.
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