Impact of Playing Level on Vascular Adaptation in Rugby League Players

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ABSTRACT

Purpose: There is substantial evidence for vascular adaptation in endurance athletes. However, little research exists for athletes that use a combination of resistance and endurance training. This study aimed to assess the vascular adaptation in professional rugby league athletes in comparison to age-matched university rugby league players. ***Methods:*** Players from the same professional club (n = 9) and university (n = 9) were recruited. Heart rate, diameter and blood flow in the carotid artery were assessed at rest using Doppler ultrasonography and repeated immediately following a sport specific exercise protocol lasting ~23 min. ***Results:*** The professional players displayed a significantly lower heart rate at rest (P = 0.003) but all other ultrasound measures were not significantly different between the groups. The exercise-induced change was not statistically significant for arterial diameter and heart rate, but the professional players exhibited a smaller relative increase in blood flow (P = 0.021). There was a significant positive association between blood flow and fat free mass in the professional players at rest (r = 0.817, P = 0.004) and post exercise (r = 0.805, P = 0.004). Conversely, the university players displayed a significant negative relationship at rest (r = -0.580, P = 0.050), though not post exercise (r = -0.442, $P > 0.05$). ***Conclusion:*** Our data are the first to suggest the existence of chronic vascular adaptations to playing rugby league, improving from university to professional level.

Key Words:

Carotid artery; Arterial diameter; Blood flow; Mixed Resistance-Endurance training