764 EFFECTS OF IN-SEASON STRENGTH AND POWER TRAINING ON SQUAT JUMP PERFORMANCE IN NCAA WOMEN VOLLEYBALL PLAYERS

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The purpose of this study was to investigate the effects of four weeks of in-season strength and power training on the ability to rapidly develop force during jumping. Twelve women volleyball players competing in NCAA Division I were tested before and after four weeks of in-season strength and power training which involved traditional heavy resistance training and Olympic-style lifts. Testing involved a concentric only squat jump performed on a force plate interfaced to a computer, which recorded vertical ground reaction force. Several measures of the athletes' ability to develop force were calculated including time to peak force, maximum rate of force development, peak and average force over the concentric phase. Comparing the pre to post training results, there was a significant decrease in the time to peak force of 36% (0.366 +/- 0.006 s pre vs. 0.229 +/- 0.006 s post), a 4.2% increase in peak force produced (1435 +/- 126 N pre vs. 1496 +/- 202 N post), and a 9.5% increase in average concentric force (540 +/- 54 N pre vs. 593 +/- 89 N post). However, there was no change in the rate of force development determined as the steepest increase in force over a 30ms epoch. From these results, it appears that a mixed-methods training regimen involving both basic strength movements, as well as Olympic-style power training, is effective for increasing the athletes' ability to rapidly attain a high level of force during the concentric phase of a vertical jump. Further, these improvements have been elicited despite a heavy in-season practice and competition schedule. The fact that mRFD did not change may be attributed to the type of training undertaken during this period in which plyometric and ballistic resistance training were limited. However, it should be noted that the heavy resistance training did not reduce mRFD either. The lack of change may also be due to the high variance in this measure which was determined dynamically rather isometrically as has been done previously. Practically, dynamic strength and the ability to rapidly increase force can be maintained or even increased in-season through appropriate resistance training.