

Isometric Shoulder Force in Female and Male NCAA Swimmers

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Introduction

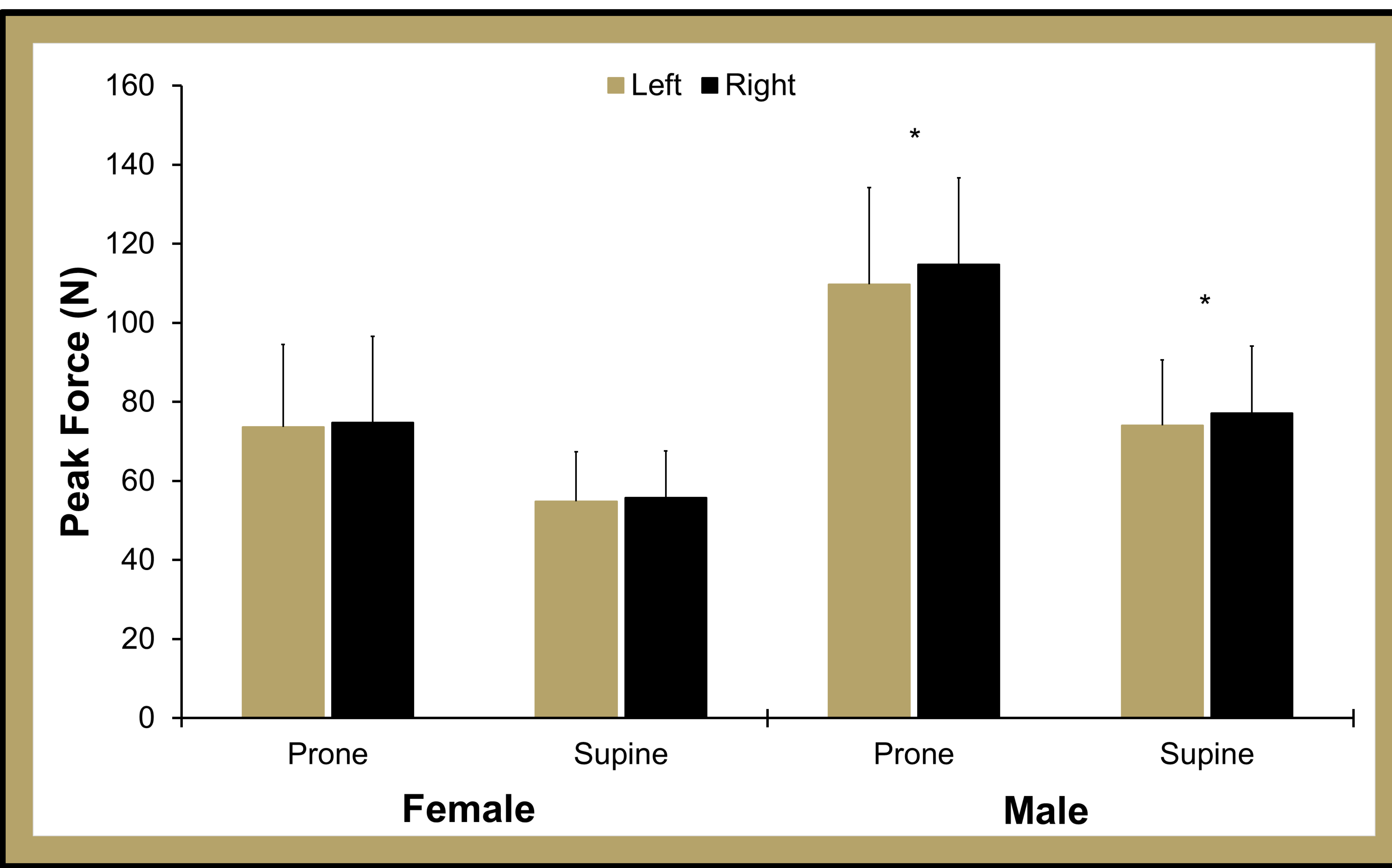
- Interlimb asymmetry is a comparison of one limb to the other and has been of great interest in athletic populations.
- Asymmetries of >15% have been related to an increased injury risk whereas an asymmetry of <10% is commonly used for athletes returning to sport following an injury.
- The Athletic Shoulder (ASH) test is a valid and reliable test used to determine isometric strength across the shoulder girdle.
- However, the ASH test to the best of our knowledge has never been examined in college swimmers.
- Therefore, it is important to understand typical forces and asymmetries produced during the ASH test in this population so that practitioners can properly interpret and provide interventions.

Purpose

- To describe shoulder girdle force production in the “Y” position in men and women in prone and supine positions in the left and right arm and to assess differences in shoulder force production anteriorly and posteriorly in the “Y” position between collegiate male and female swimmers.

Methods

- Twenty-two male and twenty-three female NCAA Division I swimmers participated.
- Following a standardized warm-up, athletes performed three bilateral isometric shoulder contractions on dual force plates.
- All tests were performed with the athlete in the prone and supine positions.
- The two testing positions were with shoulders were abducted 135° (“Y”). The first test was prone, and the second test was supine.
- For the tests, athletes were given a three second countdown for each repetition, then instructed to maximally push for five seconds
- Sixty seconds rest was given between each repetition.
- This was then repeated for a total of three repetitions
- Athletes then switched positions the opposite one they started with.



Results

Gender	Prone Left	Prone Right
Female	73.6 ± 20.9 N	74.8 ± 21.8 N
Male	109.7 ± 24.5 N	114.8 ± 21.9 N

Gender	Supine Left	Supine Right
Female	54.8 ± 12.6 N	55.7 ± 11.9 N
Male	74.0 ± 16.6 N	77.1 ± 17.0 N

- Significant Gender-by-Position interactions were found for the right (p<0.001) and left arms (p=0.001).
- Men produced more force than women in each position (p<0.01).
- All athletes produced greater force in the prone position compared to supine position (p<0.01).
- In men, magnitude of difference (d) between prone and supine force was 2.07 for right and 1.94 for left arms. In women, this difference was 1.41 for right and 1.24 for left arms.

Conclusions

- This is the first known study to report descriptive data for the ASH test in collegiate swimmers.
- It was found that men produced significantly more force in both the prone and supine positions for both the right and left arm compared to women in the same position.
- Both men and women produced more force in the prone position than in the supine position in both the right and left arms.
- The magnitude of difference between prone and supine force production in men and women show larger differences for men compared to women.
- Practitioners can use the descriptive data shown here as normative baseline to compare their athletes' data. The magnitude differences between supine and prone position could potentially relate to shoulder instability.

