

Female Swimmers Exhibit Greater Isometric Force Symmetry Across the Shoulder Girdle Than Male Swimmers

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Introduction

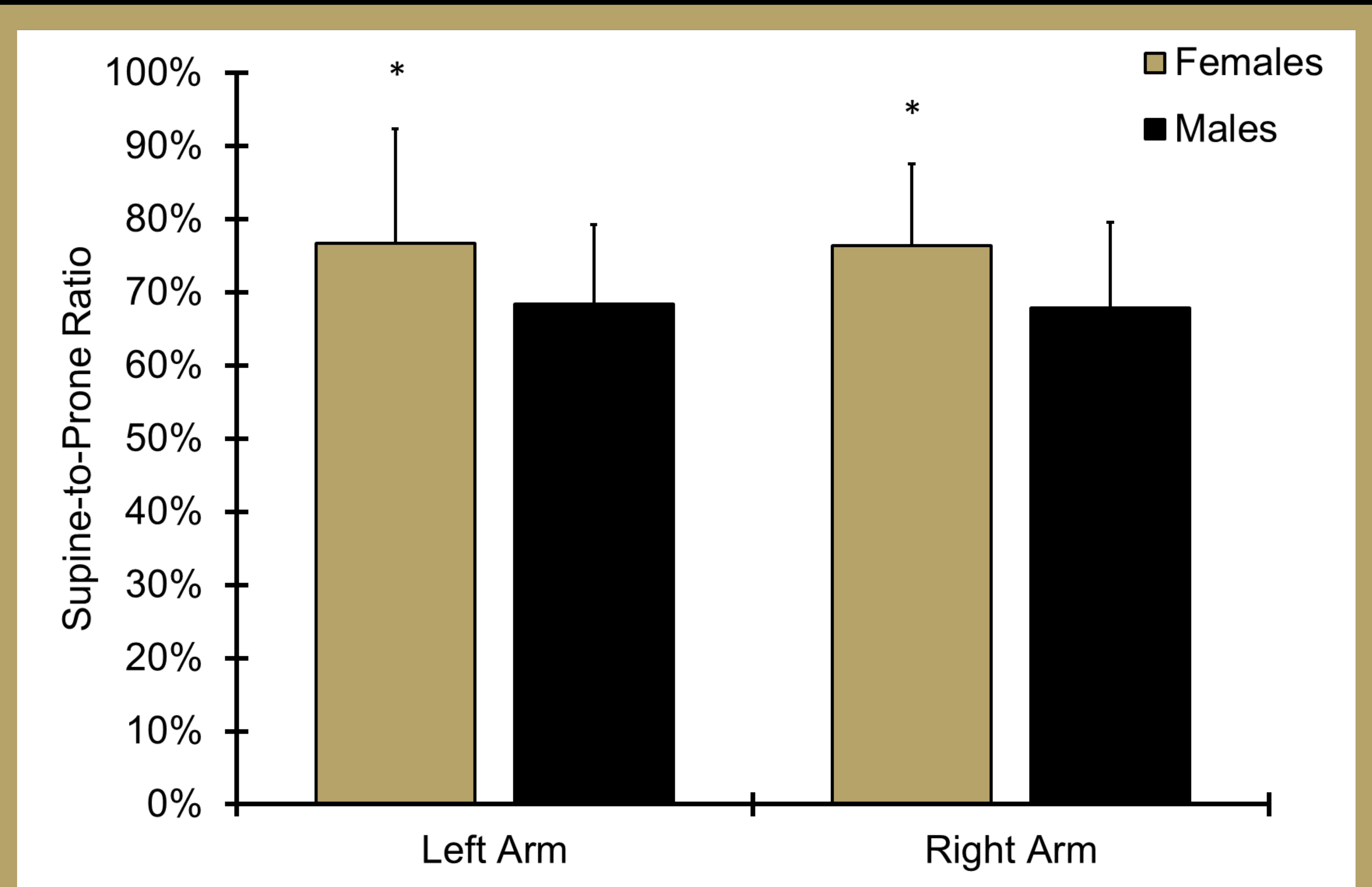
- The Athletic Shoulder test is a test that measures force across the shoulder girdle.
- This test is used to assess and monitor isometric strength for upper body specific athletes.
- Swimming demands bilateral movements throughout the water in many different directions and arm positions.
- The different positions and demand of swimming puts strain on the shoulder and can cause 'Swimmer's shoulder'.
- Swimmer's shoulder primarily occurs due to overuse of the glenohumeral joint.
- Increased posterior shoulder strength could result in better stabilization of the glenohumeral joint and reduced risk of swimmer's shoulder.
- Additionally, bilateral asymmetry may result in an increased workload on one shoulder and increase the risk of swimmer's shoulder.
- Therefore, it is important to properly assess shoulder strength in swimmers to decrease the likelihood of developing a shoulder injury.

Purpose

- To determine the differences in the supine-to-prone ratio of isometric shoulder force production between male and female collegiate swimmers.

Methods

- Forty-five Lindenwood swimmers (F=23 M=22) participated in this cross-sectional study.
- There was a standardized warm-up prior to testing.
- Athletes performed three bilateral isometric contractions in both the supine and prone laying positions with arms straight and shoulders abducted 135° ("Y").
- Peak isometric force was recorded from each trial
- Supine-to-prone ratio was determined using the mean peak force over the three trials in each position.
- A two-way ANOVA was performed to determine difference between the genders and arms.



Results

- Females (78.5% ± 13.5%) had a significantly (p=0.019) greater supine-to-prone ratio compared to males (68.1% ± 11.2%), independent of the arm tested.
- There were no significant differences for supine-to-prone ratios between the arms independent of gender.
- Athletes produced significantly (p<0.001) more force prone (92.8 ± 29.1 N) compared to supine (65.2 ± 17.7 N) independent of arm tested.
- Males produced significantly more force in both the supine and the prone positions compared to females:
 - Males
 - Supine = 75.6 ± 16.7 N
 - Prone = 112.2 ± 23.1 N
 - Female
 - Supine = 55.3 ± 12.1 N
 - Prone = 74.2 ± 21.1 N

Conclusions

- We are the first study to report descriptive data for an ASH test in collegiate swimmers' shoulders.
- Female collegiate swimmers had more isometric symmetry across the shoulder gridle than male collegiate swimmers.
- These results could indicate a reduced risk of swimmer's shoulder in female swimmers.
- These results provide rehabilitation and performance practitioners with objective markers to inform their decision making around capability of meeting performance demands of the sports and safe return to swimming following an injury.
- There should be further research done to determine the relationship between isometric shoulder strength and risk of shoulder injury in this population.