Sex-Specific Analysis in Abstracts Presented at AANA and AOSSM Annual Meetings from 2016-2019

Carrie Huang BS¹, Arianna L. Gianakos DO², Meghan Merklein MD², Angelica Pinninti MD³, Brett D. Owens MD⁴, Mary K. Mulcahey MD⁵

¹Tulane University School of Medicine
²Jersey City Medical Center
³Lewis Katz School of Medicine at Temple University
⁴Department of Orthopaedic Surgery, Brown University
⁵Department of Orthopaedic Surgery, Tulane University

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Disclosures

- Carrie Huang BS  
  - No Disclosures
- Arianna L. Gianakos DO  
  - No Disclosures
- Meghan Merklein MD  
  - No Disclosures
- Angelica Pinninti MD  
  - No Disclosures
- Brett D. Owens MD  
  - AOSSM
  - AANA
  - AAOS
  - American Shoulder and Elbow Surgeons
- Mary K. Mulcahey MD  
  - Speaker’s Bureau
    - Arthrex, Inc
  - Board/Committee member
    - AAOS
    - American Orthopaedic Society for Sports Medicine
    - Arthroscopy Association of North America
    - Ruth Jackson Orthopaedic Society
    - The Forum
Introduction

- Men and women exhibit differences in sports injuries and other orthopaedic-related pathologies due to anatomic, hormonal, biomechanical, and neuromuscular differences.

- Women were historically excluded from clinical research until 1993. The NIH currently requests that sex-specific analysis (SSA) be included in clinical trials where appropriate.

- Rates of SSA reporting have slowly increased over the years, but there is still a low proportion of articles including SSA.
Study Aims

• Evaluate the presence of sex-specific analysis in abstracts accepted for podium presentation at the AANA and AOSSM Annual Meetings from 2016-2019.

• Determine the percentage of female first and senior authors and analyze whether there is a correlation between female author and SSA reporting.

• Determine if there is an association between anatomical focus of study (knee, shoulder, etc) and SSA reporting.

• Determine the highest degree of female first and senior authors.
Methods

- All abstracts accepted for podium presentation at AANA and AOSSM from 2016-2019 were reviewed and evaluated for the presence of SSA.

- SSA was defined as the use of sex as a variable in a multifactorial statistical model. Cadaveric, animal, and single-gender studies were excluded from review.
Descriptive statistics were used to determine:
- The percentage of abstracts including SSA
- If there was a correlation between SSA reporting and female lead or senior author
- If there was a correlation between anatomical focus of study and SSA reporting.

A p-value of <0.05 was selected as the threshold for statistical significance.
### Abstracts Accepted as Podium Presentations at AANA and AOSSM Between 2016-2019

<table>
<thead>
<tr>
<th></th>
<th>AANA</th>
<th>AOSSM</th>
<th>Combined</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of abstracts accepted for podium presentation</td>
<td>322</td>
<td>708</td>
<td>1,030</td>
</tr>
<tr>
<td>Number of cadaveric, animal, &amp; single-gender studies that were excluded (% of total)</td>
<td>38 (12%)</td>
<td>101 (14%)</td>
<td>139 (13%)</td>
</tr>
<tr>
<td>Number of abstracts analyzed after exclusion criteria</td>
<td>284</td>
<td>607</td>
<td>891</td>
</tr>
<tr>
<td>Number of abstracts including SSA (% of total)</td>
<td>24 (8%)</td>
<td>66 (11%)</td>
<td>90 (10%)</td>
</tr>
</tbody>
</table>
Data

Correlation Between SSA and Female First or Senior Author

<table>
<thead>
<tr>
<th></th>
<th>SSA and Female First Author Correlation (Pearson; p-value)</th>
<th>SSA and Female Senior Author Correlation (Pearson; p-value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AANA Abstracts</td>
<td>0.048; 0.209</td>
<td>0.048; 0.211</td>
</tr>
<tr>
<td>AOSSM Abstracts</td>
<td>0.029; 0.234</td>
<td>0.061; 0.066</td>
</tr>
<tr>
<td>All Abstracts Combined</td>
<td>0.035; 0.147</td>
<td>0.052; 0.059</td>
</tr>
</tbody>
</table>
## Correlation Between SSA and Anatomic Focus of Study

<table>
<thead>
<tr>
<th>Anatomic Focus</th>
<th>Number of Studies</th>
<th># of Studies with SSA (% of total)</th>
<th># of studies without SSA (% of total)</th>
<th>Pearson</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elbow</td>
<td>54</td>
<td>3 (6%)</td>
<td>51 (94%)</td>
<td>-0.04</td>
<td>0.13</td>
</tr>
<tr>
<td>Shoulder</td>
<td>225</td>
<td>17 (7%)</td>
<td>238 (93%)</td>
<td>-0.07</td>
<td>0.01</td>
</tr>
<tr>
<td>Foot/Ankle</td>
<td>43</td>
<td>2 (5%)</td>
<td>41 (95%)</td>
<td>-0.04</td>
<td>0.11</td>
</tr>
<tr>
<td>Knee</td>
<td>344</td>
<td>46 (13%)</td>
<td>298 (87%)</td>
<td>0.08</td>
<td>0.01</td>
</tr>
<tr>
<td>Hip</td>
<td>139</td>
<td>10 (7%)</td>
<td>129 (93%)</td>
<td>-0.03</td>
<td>0.18</td>
</tr>
<tr>
<td>Other</td>
<td>56</td>
<td>12 (21%)</td>
<td>44 (79%)</td>
<td>0.08</td>
<td>0.01</td>
</tr>
</tbody>
</table>
Data

Degrees of Female Authors

- BSN
- PA-C
- PT
- ATC
- MPH
- DO
- MS/MA
- Bachelor
- PhD
- MD

Female Senior Author
Female First Author
Results

• Overall, there were 891 studies, with 90 (10%) abstracts including SSA.

• There was a positive correlation between SSA reporting and both female first and senior author, but this correlation was not statistically significant.

• Knee studies has a statistically significant positive correlation with SSA reporting; shoulder studies had a statistically significant negative correlation with SSA reporting.

• The majority of female first and senior authors were MDs.
Study Limitations

• Only abstracts were available for review. It is possible some studies performed SSA, but did not report it in the abstract.

• Small sample size. Many were excluded from analysis, as they were cadaveric, animal, or single-gender studies.

• There has been no established guideline determining when SSA is necessary and appropriate in statistical analysis. SSA may not be practical for all studies.
Conclusions

• Only 10% of abstracts accepted for podium presentation at AANA and AOSSM Annual Meetings from 2016-2019 included SSA.

• Future studies should attempt to perform SSA where relevant in order to better evaluate differences in outcomes between male and female patients.
References


