Quality of Research and Level of Evidence in Foot and Ankle Publications

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Background:
There is a heightened awareness of evidence-based medicine in the last decade. The quality of clinical research and evidence to support medical treatments is under scrutiny from the medical profession and the public. Some orthopedics subspecialties have examined the rigor of their scientific methods and quality of their published literature. In 2003, JBJS-A published a review assessing research quality in 9 orthopedics journals and found a high number of level IV studies. FAI had the highest percentage of level IV evidence 75% (30/40) amongst the 9 journals. Podiatric journals were similarly reviewed in 1998 finding a high percentage (72%, 47/65) of case series.

Purpose:
The purpose of this study was to examine the current quality of research and level of evidence published in the subspecialty of foot and ankle surgery in both the orthopedic and podiatric medical journals.

Methods:
Two independent evaluators performed a blinded assessment of all original foot and ankle clinical research articles (January 2010-June 2010) from North American orthopedic and podiatric journals. Only the title, introduction, abstract, methods and results sections were used to assess the type of study and level of evidence (JBJS-A grading system). Articles were also assessed for subject number, use of validated outcomes measures and use of statistical analysis. The data was stratified by journal and author credentials. Qualitative analysis was performed.

Results:
245 articles were published, 128 were case studies, surgical techniques, biomechanical, basic science or cadaver studies and were excluded, leaving 117 clinical research articles. Of these 117 articles, 7 (6%) were level I, 14 (12%) level II, 18 (15%) level III and 78 (67%) level IV. Level of evidence by journal is listed in Table 1. Eighty-six articles (74%) were published by a MD and 21 (18%) by a DPM. MDs published 69% (59/86) level IV studies, whereas DPMs published a slightly higher percentage of level IV studies 76% (16/21). When the quality of research was examined, only 27 (28%) of the 95 therapeutic studies used validated outcome measures and only 37 of the 95 (39%) gathered data prospectively. Fifty three (56%) of the 95 therapeutic studies used a control or comparison group, however, only 2 (2%) studies performed a power analysis. The mean sample size for all studies was 65 patients (Range 4-1000).

Table 1: Level of evidence in foot and ankle literature.

<table>
<thead>
<tr>
<th>General orthopedic journals*</th>
<th>FAI</th>
<th>FAS</th>
<th>JAPMA</th>
<th>JFAS</th>
</tr>
</thead>
<tbody>
<tr>
<td>total</td>
<td>29</td>
<td>41</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>I</td>
<td>0</td>
<td>3 (7%)</td>
<td>1(12.5%)</td>
<td>2(17%)</td>
</tr>
<tr>
<td>II</td>
<td>5(17%)</td>
<td>4(10%)</td>
<td>1(12.5%)</td>
<td>3(25%)</td>
</tr>
<tr>
<td>III</td>
<td>3(10%)</td>
<td>8(20%)</td>
<td>1(12.5%)</td>
<td>2(17%)</td>
</tr>
<tr>
<td>IV</td>
<td>21(72%)</td>
<td>26(63%)</td>
<td>5(62.5%)</td>
<td>5(42%)</td>
</tr>
</tbody>
</table>

Conclusions:
FAI published better quality studies with a higher level of evidence as compared to prior review. Fewer studies with lower level of evidence were published in the podiatric JFAS, and JAPMA journals. Regardless of the journal, MDs produced the majority of published clinical foot and ankle research. Every effort should be made to choose the best type of study for each question therapeutic, prognostic or diagnostic. Whenever possible, data should be gathered prospectively, and validated outcome measures and comparison groups should be used. Although small improvements have been made in the quality of some clinical research, this study highlights the need to strive for higher level study design and continued improvement in methodology within the foot and ankle literature.

Level of evidence: N/A