Hip Characteristics Found in NCAA Hockey Players

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ABSTRACT

Femoroacetabular impingement (FAI) results from abnormal contact between the neck of the femur and the pelvis. Due to this impingement, the individual experiences pathological changes or conditions in the femoral head, labrum, and/or acetabulum. The literature suggests that playing ice hockey may predispose an athlete to the development of this pathological change. It was our intent to investigate whether NCAA ice hockey players exhibit certain hip characteristics associated with FAI, such as a positive hip impingement test or discomfort with decreased hip range of motion. Requests for ice hockey teams to participate in this study were emailed to the athletic trainers responsible for their medical coverage. A total of seven NCAA ice hockey teams participated (N=148; n=104 males, n=44 females). Associated medical staffs or researchers administered surveys to collect demographic information about each player, including their personal background in ice hockey and any past or current history of hip pathology. Hip range of motion measurements were also performed on the athletes by trained healthcare providers. Any deficiencies or pain with hip flexion or internal rotation were noted as positive clinical findings for FAI (hip flexion <120 degrees; hip internal rotation <30 degrees). Descriptive statistics were used to report the population characteristics. A bivariate correlation and one-way ANOVA analysis were used to challenge the relationship of pathological FAI symptoms and hip function (p<0.05). Final analysis showed a positive correlation between the number of years of playing hockey and likelihood of exhibiting clinical signs of FAI (Hip Flexion p<0.001; Hip Internal Rotation p<0.039). Athletes who showed clinical signs of FAI in one testing area, were also likely to express signs in another area (significant between decreased hip flexion and hip internal rotation). Contrary to our hypothesis, hip characteristics did not significantly differ between various playing positions. However, defenseman did lead the groups with 79.5% experiences pathological changes or conditions in the femoral neck, labrum, and/or acetabulum. The literature suggests that playing ice hockey may cause for osteoarthritis of the hip.

METHODS

Subjects

➢ Total of seven NCAA ice hockey teams participated in this study
➢ Ages ranging between 18-25 years old (average of 21.3 years)
➢ All participants provided written informed consent as approved by the IRB for the University of Wisconsin – Eau Claire.

Screening and Testing Procedures

➢ Requests to participate were sent via email to the medical staff of all NCAA ice hockey institutions.
➢ Participating teams were provided with all testing materials and an instructional video. The video served as a guide for testing procedures and helped maintain measurement consistency between various examiners.
➢ A questionnaire was provided to all subjects to answer a series of questions regarding basic demographic information, history with hockey participation, and any past or current history of hip pathology.
➢ Trained healthcare providers performed a hip assessment, involving range of motion measurements (flexion, internal rotation and external rotation) and the hip impingement test. Measurements were recorded and any pain or discomfort were noted.
➢ The completed subject questionnaires and measurements were returned to our research team for collective data analysis.

RESULTS

Table 1. General Population Characteristics

<table>
<thead>
<tr>
<th>Number of Participants</th>
<th>Total Population</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range of 7-22 (avg. 16.12)</td>
<td>148</td>
<td>104</td>
<td>44</td>
</tr>
<tr>
<td>Range of 9-22 (avg. 17.4)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Range of 7-17 (avg. 13)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>History of Groin Pain</td>
<td>32.4% (48)</td>
<td>34.6% (36)</td>
<td>27.3% (12)</td>
</tr>
<tr>
<td>Pain in other Areas</td>
<td>40.5% (60)</td>
<td>39.4% (41)</td>
<td>40.9% (18)</td>
</tr>
</tbody>
</table>

Table 2. Physical Exam Characteristics – Positive Findings

<table>
<thead>
<tr>
<th>Position</th>
<th>Number of Players</th>
<th>Percentage Displaying at Least One Clinical Sign</th>
<th>Percentage of Positive Cases of Hip Flexion</th>
<th>Internal Rotation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forward</td>
<td>81</td>
<td>55.6%</td>
<td>35.8%</td>
<td>32.1%</td>
</tr>
<tr>
<td>Defense</td>
<td>39</td>
<td>79.5%</td>
<td>38.5%</td>
<td>33.3%</td>
</tr>
<tr>
<td>Goalie</td>
<td>19</td>
<td>42.1%</td>
<td>15.8%</td>
<td>21.1%</td>
</tr>
<tr>
<td>Both Forward &amp;</td>
<td>9</td>
<td>77.8%</td>
<td>22.2%</td>
<td>11.1%</td>
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Table 3. Results Broken Down by Hockey Playing Position

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SUMMARY AND CONCLUSIONS

➢ The longer that the participant played hockey, the more likely they were to exhibit clinical signs of FAI (Hip Flexion p<.001; Hip Internal Rotation p<.039).
➢ Recorded hip characteristics did not significantly differ between playing positions. However, the defenseman position exhibited higher incidences of FAI related characteristics compared to any other position.
➢ Athletes who showed clinical signs of FAI in one testing area, were likely to exhibit signs in another area- significant related to decreased hip flexion and internal rotation.
➢ The findings showed that the Hip Impingement Test was not a significant tool in screening for clinical signs of FAI.
➢ Suggest early FAI screening should be done on young hockey players, so intervention can be established if necessary- possibly avoid FAI or Hip Osteoarthritis in the future.
➢ Women- entrance to/early college age
➢ Men- high school age
➢ Future research should be done to further investigate how clinical signs of FAI present in hockey players and how preventative screening tools may be used.
➢ In addition, the use of radiographic instruments (e.g., 3D CT scan) should be used to diagnosis FAI and to further validate the clinical tests used.

REFERENCES


ACKNOWLEDGMENTS

We would like to thank all of the participating NCAA athletes and their medical staff for assisting in data collection. We want to thank and acknowledge the contribution and support of this project from the Student Blugold Commitment Differential Tuition funds through the UW – Eau Claire Faculty/Student Research Collaboration program by the Office of Research and Sponsored Programs.