Incidence and Trends of Concurrent Hip Diagnoses for Aging Adolescent Idiopathic Scoliosis Patients

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Disclosures

• No relevant disclosures
• All disclosures can be found on http://www7.aaos.org/education/disclosure/search
Introduction

• Adolescent Idiopathic Scoliosis (AIS) patients have been studied to have higher rates of hip pathology, including developmental hip dysplasia, compared to the unaffected population.

• Hip and scoliosis pathologies are often related due to the pelvic attachment at the lumbosacral junction

• However, rates of co-occurring (i.e. multiple) hip diagnoses for AIS patients are understudied.
Methods

- Patients in the NIS database (2005-2013) ≥10 years with the ICD-9 code for idiopathic scoliosis (737.30) were included.
- ICD-9 codes were used to identify specific hip diagnoses. Descriptive analyses assessed overall cohort demographic, comorbidity, and diagnosis profiles.
- Patients were stratified by age (10-19, 20-29, 30-39, 40-49, 50-59, 60-69, 70+).
- Chi-squared tests compared rates of hip diagnoses across age groups via Chi-squared tests. For patients with multiple hip diagnoses, cross-tabulation assessed rates of co-occurring (2 or more) diagnoses.
Results: Cohort Overview

- 229,237 idiopathic scoliosis patients were isolated (57±25 years, 76% female).
- Patient breakdown by age group: 10-19 (11.9%), 20-29 (9.7%) 30-39 (7.3%) 40-49 (7.3%), 50-59 (10.9%) 60-69 (13.8%), 70+ (39.1%).
- Overall, 2.8% of patients had hip diagnoses, including osteoarthritis (2.1%), enthesopathy (0.2%), osteonecrosis (0.2%), congenital deformity (0.2%), and dysplasia (0.1%).
## Results

<table>
<thead>
<tr>
<th>Time to Procedure</th>
<th>10-19 yrs</th>
<th>20-29 yrs</th>
<th>30-39 yrs</th>
<th>40-49 yrs</th>
<th>50-59 yrs</th>
<th>60-69 yrs</th>
<th>70+ yrs</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proportion of population (%)</td>
<td>11.9%</td>
<td>9.7%</td>
<td>7.3%</td>
<td>7.3%</td>
<td>10.9%</td>
<td>13.8%</td>
<td>39.1%</td>
<td></td>
</tr>
</tbody>
</table>

### Hip Diagnoses

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Any (%)</th>
<th>Osteoarthritis</th>
<th>Osteonecrosis</th>
<th>Enthesopathy</th>
<th>Dysplasia</th>
<th>Recurrent dislocation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any (%)</td>
<td>1.5%</td>
<td>0.1%</td>
<td>0.1%</td>
<td>0.0%</td>
<td>0.4%</td>
<td>0.3%</td>
</tr>
<tr>
<td>Osteoarthritis</td>
<td>0.9%</td>
<td>0.2%</td>
<td>0.2%</td>
<td>0.1%</td>
<td>0.1%</td>
<td>0.2%</td>
</tr>
<tr>
<td>Osteonecrosis</td>
<td>0.9%</td>
<td>0.5%</td>
<td>0.3%</td>
<td>0.2%</td>
<td>0.1%</td>
<td>0.1%</td>
</tr>
<tr>
<td>Enthesopathy</td>
<td>1.2%</td>
<td>2.0%</td>
<td>0.3%</td>
<td>0.2%</td>
<td>0.1%</td>
<td>0.1%</td>
</tr>
<tr>
<td>Dysplasia</td>
<td>1.7%</td>
<td>2.6%</td>
<td>0.3%</td>
<td>0.2%</td>
<td>0.1%</td>
<td>0.1%</td>
</tr>
<tr>
<td>Recurrent dislocation</td>
<td>3.2%</td>
<td>3.5%</td>
<td>0.3%</td>
<td>0.3%</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
</tbody>
</table>

**p-value**

- <0.001
- <0.001
- <0.001
- <0.001
- <0.001
- <0.001
- <0.001

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*Department of Orthopedic Surgery*
Results

• For adolescent idiopathic scoliosis patients ages 10-29, the most common co-occurring hip diagnoses were congenital deformity/osteoarthritis (29% of co-occurrences), congenital deformity/dysplasia (16%), and osteoarthritis/recurrent dislocation (16%).

• For patients 30-59, congenital deformity/osteoarthritis (45%) and osteoarthritis/osteonecrosis (36%) were the most common co-occurrences.

• For patients 60+, the most common co-occurrences of hip diagnoses were osteoarthritis/osteonecrosis (42%) and osteoarthritis/enthesopathy (34%).
Discussion

• Increasing patient age was associated with higher rates of hip diagnoses, including osteoarthritis, osteonecrosis, and enthesopathy; dysplasia and recurrent dislocation decreased with age.

• Compared to the general population however, AIS patients are believed to develop OA at an earlier age due to the biomechanical dysfunction of AIS placing unusual pressure on the hip joints.

• Hip dysplasia usually first presents in early childhood and rarely extends beyond menarche as described by Proschek et al. Furthermore, DDH predisposes patients to recurrent dislocation.
Conclusions

• For adolescent idiopathic scoliosis patients, as decades of life increase, so too do rates of overall and concurrent hip diagnoses, including osteoarthritis and osteonecrosis.

• Co-occurrences of hip diagnoses differed by idiopathic scoliosis age group, with younger patients showing higher rates of osteoarthritis and recurrent dislocation than older patients.