Prediction Of Therapeutic Response To Cervical Epidural Steroid Injection 
According To Distribution Of Radicular Pain

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Abstract

Objective: This study aimed to determine whether the distribution of radicular pain has predictive value in identifying patients who would benefit from transforaminal cervical epidural injections.

Design: Retrospective cohort study of subjects with cervical radiculopathy who underwent cervical epidural steroid injections from February 2005 to January 2006. Data from subjects were divided into groups based on pain distribution, imaging-based diagnosis of cervical disk herniation or stenosis, and their response to treatment. Chi2 tests were used to assess the relationships between distribution and benefit.

Results: Of the 117 charts reviewed, complete data were available for 94 subjects. Forty-eight subjects had cervical disk herniations and, of these, 52% had pain above the elbow with 60% benefit, and 48% had pain below the elbow with 61% benefit. Forty-six subjects had cervical stenosis and, of these, 57% had pain above the elbow with 62% benefit, and 43% had pain below the elbow with 80% benefit. Benefit was defined as 70% or greater reduction in pain. Chi2 testing demonstrated no statistically significant difference in beneficial response to cervical epidural steroid injections based on pain distributions.

Conclusions: The likelihood of subjects to report a positive benefit from cervical epidural steroid injections as a treatment of their cervical radicular pain was independent of the distribution of their pain. Although our results did not show pain distribution to have a predictive value, additional research is needed in identifying predictive factors to improve outcomes and reduce cost.

Introduction

Cervical radiculopathy:
- Characterized by weakness, pain, and/or numbness along a nerve root.
- Annual incidence of 107.3 & 63.5 per 100,000 for men & women respectively.
- Most common etiology: foraminal stenosis & disk herniations.
- Inflammatory pathophysiology is a well-established target for glucocorticoids.
- Epidural steroid injections (ESI) are commonly used with varied benefit.
- Varied response is likely secondary to limitations in patient selection.
- Improving ESI response will depend on identifying predictive factors.

Cervical Epidural steroid injections:
- Performed by either interlaminar or transforaminal approaches.

Methods

- Retrospective chart review from February 2005 to January 2006.
- Patients from a community based multidisciplinary pain clinic.
- Cervical transfornaminal ESI at an ambulatory surgery center.
- Chi2 tests to assess relationships between distribution & benefit.

Results

Table 1: Demographic Data

<table>
<thead>
<tr>
<th>Age</th>
<th>Benefit With Treatment [n=61]</th>
<th>No Benefit With Treatment [n=33]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>60% (23 of 39)</td>
<td>60% (22 of 55)</td>
</tr>
<tr>
<td>Female</td>
<td>72% (28 of 39)</td>
<td>78% (11 of 39)</td>
</tr>
<tr>
<td>BMI</td>
<td>29.2 (+/- 6.2; R 17.8-49.7)</td>
<td>28.9 (+/- 6.7; R 19.2-45.1)</td>
</tr>
<tr>
<td>Smoker</td>
<td>65% (28 of 43)</td>
<td>35% (15 of 43)</td>
</tr>
<tr>
<td>Non-smoker</td>
<td>65% (33 of 51)</td>
<td>35% (18 of 55)</td>
</tr>
<tr>
<td>Opioids Used</td>
<td>60% (31 of 52)</td>
<td>40% (21 of 52)</td>
</tr>
<tr>
<td>Opioids Not Used</td>
<td>71% (30 of 42)</td>
<td>29% (12 of 42)</td>
</tr>
<tr>
<td>Pain duration &lt; 1 year</td>
<td>59% (17 of 29); 7 mo</td>
<td>41% (12 of 29); 6 mo</td>
</tr>
<tr>
<td>Pain duration &gt; 1 year</td>
<td>68% (44 of 65); 8 mo</td>
<td>52% (21 of 65); 52 mo</td>
</tr>
<tr>
<td>Pre-treatment Pain</td>
<td>6.1 (+/- 1.6; R 2-10)</td>
<td>6.2 (+/- 1.9; R 2-10)</td>
</tr>
</tbody>
</table>

Results of transforaminal cervical epidural steroid injection.

- 46 subjects with cervical stenosis:
  - 26 (57%) pain above the elbow with 62% benefit.
  - 20 (43%) pain below the elbow with 80% benefit.
- 48 subjects with cervical disc herniation:
  - 25 (52%) pain above the elbow with 60% benefit.
  - 23 (48%) pain below the elbow with 61% benefit.
- All Chi2 values for combined & categorized data were below the critical 0.05 Chi2 value of 3.84 for one degree of freedom.

Conclusion

Response to cervical transforaminal epidural steroid injection was found to be independent of pain distribution.

References