Parenteral Corticosteroids After Fragility Fracture Increases the Odds of a Repeat Fracture

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Introduction

- Osteoporotic fractures are associated with significant morbidity and mortality in the elderly population. As patients age, their risk for a fracture increases, and having one fracture increases the risk for a repeat fracture.
- Interventions to decrease the incidence of a repeat fracture should be implemented.
- Corticosteroids are known to increase fracture risk by stimulating apoptosis of osteoblasts and increased activity of osteoclasts. Due to this detrimental effect on bone integrity, their use should be limited in high-risk patients.
- Studies have shown that medications that increase fall risk, such as corticosteroids, are still widely used before and after fracture, and their use is not changed after the first fracture.
- This study will investigate the association of corticosteroid use with the odds of a repeat fracture and explore trends in their use in these patients.

Corticosteroids and Repeat Fracture

<table>
<thead>
<tr>
<th>Variable</th>
<th>OR (CI)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral Steroids</td>
<td>1.19 (0.96-1.49)</td>
<td>0.117</td>
</tr>
<tr>
<td>Intravenous Steroids</td>
<td>1.53 (1.09-2.14)</td>
<td>0.006</td>
</tr>
<tr>
<td>Steroids Before Fracture</td>
<td>0.94 (0.73-1.2)</td>
<td>0.794</td>
</tr>
<tr>
<td>Steroids After Fracture</td>
<td>1.12 (0.87-1.45)</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Steroids in both periods</td>
<td>0.95 (0.94-1.6)</td>
<td>0.867</td>
</tr>
</tbody>
</table>

Trends in Corticosteroid Use

- 42.6% of our patients received corticosteroids within 1 year prior or 2 years after an initial fragility fracture, and they were more likely to receive them after the first fracture.
- Corticosteroid use was associated with a significantly increased risk of a second fragility fracture (Adjusted Odds Ratio, aOR = 1.39, 95% CI = 1.13-1.71).
- Parenteral corticosteroids, but not oral, were associated with significantly increased odds of re-fracture (aOR = 1.37, 95% CI = 1.08-1.74).
- Corticosteroid usage after initial fracture showed significantly increased odds of repeat fracture (aOR = 1.52, 95% CI = 1.20-1.91).
- Parenteral corticosteroid use after fracture was associated with an increased risk of re-fracture (aOR = 1.52, 95% CI 1.18-1.96).
- Only 44.4% of patients receiving parenteral corticosteroids had a diagnosis that required its use.

Methods

2,643 patients with repeat fractures were identified in the Research Action for Health Network (REACHnet) database, which consists of multiple partner health systems in Louisiana and Texas. Each patient selected had a non-traumatic fracture diagnosis code with at least one year of medical history prior to the fracture and at least two years of follow-up time.

Multivariable logistic regression was used to identify corticosteroid trends over time, predictors of a repeat fracture, and the effect of timing and type of corticosteroid on repeat fracture.

Results

- 42.6% of our patients received corticosteroids within 1 year prior or 2 years after an initial fragility fracture, and they were more likely to receive them after the first fracture.
- Corticosteroid use was associated with a significantly increased risk of a second fragility fracture (Adjusted Odds Ratio, aOR = 1.39, 95% CI = 1.13-1.71).
- Parenteral corticosteroids, but not oral, were associated with significantly increased odds of re-fracture (aOR = 1.37, 95% CI = 1.08-1.74).
- Corticosteroid usage after initial fracture showed significantly increased odds of repeat fracture (aOR = 1.52, 95% CI = 1.20-1.91).
- Parenteral corticosteroid use after fracture was associated with an increased risk of re-fracture (aOR = 1.52, 95% CI 1.18-1.96).
- Only 44.4% of patients receiving parenteral corticosteroids had a diagnosis that required its use.

Conclusions

- Corticosteroid use is very high in patients at risk with fragility fractures, and its use increases over time. In addition, patients on corticosteroids before their initial fracture are much more likely to continue corticosteroids after the fracture despite its high risk for a repeat fracture.
- Because corticosteroid use is a risk factor for repeat fractures, patients should only be taking them if it is necessary. Our study showed that only about half of patients taking corticosteroids had a medical condition that requires corticosteroid use. This shows that steroid overutilization for inappropriate or nonspecific diagnoses may contribute to increased fracture rates.
- Physicians should take caution in prescribing parenteral corticosteroids in osteoporotic patients, especially after the initial fracture, in order to prevent the high morbidity and mortality associated with repeat fractures.