Effect of topical treatment of various glucocorticoids on middle ear effusion in chinchilla

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INTRODUCTION

Orbit media with effusion (OME) is a common childhood disease. Among many causative factors of OME, inflammation and mechanical factors are of most importance. These factors stimulate middle ear epithelial and inflammatory cells to secrete inflammatory mediators that mediate mucosal permeability and secretory activity resulting in middle ear effusions (MEEs)(3).

Typically, OME is treated with antibiotics, corticosteroids, or antibiotics with and without decongestants (2). Use of glucocorticoids has increased since the launch of the first glucocorticoid (Triamcinolone) in 1957. Various glucocorticoids are more effective than OME alone (4,3). Topical application has also been shown to be more effective than oral ingestion of glucocorticoids. It reduces side effects while achieving higher local concentration (1).

ABSTRACT

Objective: To compare the effectiveness of 5 glucocorticoids in treating lipopolysaccharide induced otitis media with effusion in chinchilla.

Methods: Chinchillas were divided into 11 treatment groups. Five glucocorticoids, dexamethasone, fludrocortisone, dexamethasone sodium phosphate, fluconazole, and hydrocortisone, at 0.1% and 1.0% concentrations were administered for 96 hours relative to lipopolysaccharide administration. After 96 hours, animals were euthanized, middle ear effusions were collected and measured.

Results: All glucocorticoids tested generally reduced middle ear effusion and mucosal thickness compared to vehicle. Dexamethasone sodium phosphate was the only glucocorticoid to significantly reduce both middle ear effusion and mucosal thickness at both 0.1% and 1% concentrations (p<0.05).

Conclusions: These results demonstrate the antiinflammatory efficacy of glucocorticoids in an animal model of otitis media with effusion. Among five glucocorticoids tested, dexamethasone sodium phosphate was the most effective in reducing the volume of lipopolysaccharide–induced otitis media with effusion.

Table 1: Characterization of test substances

<table>
<thead>
<tr>
<th>Substance</th>
<th>Concentration</th>
<th>Effectiveness</th>
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</thead>
<tbody>
<tr>
<td>Dexamethasone sodium phosphate</td>
<td>0.1%</td>
<td>Significant</td>
</tr>
<tr>
<td>Dexamethasone sodium phosphate</td>
<td>1.0%</td>
<td>Significant</td>
</tr>
<tr>
<td>Fludrocortisone</td>
<td>0.1%</td>
<td>Significant</td>
</tr>
<tr>
<td>Fludrocortisone</td>
<td>1.0%</td>
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REFERENCES