Polyethylene Glycol Hydrogel Versus Fibrin Glue Sealant For Posterior Fossa Surgery: A Budget-Impact Analysis In Five European Countries

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Methods

• A decision-tree model (Figure 1) comparing FG with PEG hydrogel was adapted for Belgium, France, Germany, Italy and the UK.4
• Model time encompasses from surgery to four months after discharge.
• A structured review of PubMed identified Europe-specific efficacy and cost data relevant to posterior fossa surgery and sealing of the access site.
• Cost data were sourced from official reimbursement information and published literature and, if necessary, adjusted to 2021/22 rates (Table 1).
• The model accounted for postoperative events and length of stay.
• The application of dural sealants was assumed not to impact operating time.
• The complication rate for each sealant is shown in Table 2.
• One-way sensitivity analysis (OWSA) was carried out to account for the effect of key variables and input data.

Key parameters

<table>
<thead>
<tr>
<th>Belgium (EUR)</th>
<th>France (EUR)</th>
<th>Germany (EUR)</th>
<th>Italy (EUR)</th>
<th>UK (GBP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital stay per day</td>
<td>579</td>
<td>125</td>
<td>434</td>
<td>333</td>
</tr>
<tr>
<td>Operative repair</td>
<td>6,837</td>
<td>5,421</td>
<td>5,056</td>
<td>4,109</td>
</tr>
<tr>
<td>Lumbar drain</td>
<td>830</td>
<td>1,777</td>
<td>1,948</td>
<td>2,839</td>
</tr>
</tbody>
</table>

Table 1: Key cost parameters. Adjusted to 2021/22 rates.

Results

• For all five countries, the change from FG to PEG hydrogel is expected to be cost-saving (Figure 2).
• The model estimated a reduction in costs between 18% and 26% with PEG hydrogel compared to FG.
• The higher costs of the PEG hydrogel were offset by the reduction in CSF leak-related costs and a reduction in the average length of stay.
• Cost savings for CSF leaks are linked to the decreased incidence of CSF leaks.
• The OWSA showed that cost savings were retained if the CSF leak incidence was assumed equal for both sealants.

Conclusion

The adoption of PEG hydrogel is estimated to be cost-saving for posterior fossa surgeries in the five investigated countries.

Adverse events

<table>
<thead>
<tr>
<th>PEG hydrogel</th>
<th>Fibrin glue</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSF leak</td>
<td>2.4%</td>
</tr>
<tr>
<td>Pseudomeningocele</td>
<td>9.6%</td>
</tr>
<tr>
<td>Wound infection</td>
<td>2.4%</td>
</tr>
<tr>
<td>Aseptic meningitis</td>
<td>4.0%</td>
</tr>
</tbody>
</table>

Table 2: Complication rate of PEG hydrogel and fibrin glue per patient for CSF leak-associated costs and total costs. PEG: Polyethylene glycol. FG: Fibrin glue.

References


Disclosures

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Figure 1: Pathway of the model. PEG: Polyethylene glycol hydrogel. CSF: Cerebrospinal fluid

Figure 2: Cost savings of PEG hydrogel vs FG per patient for CSF leak-associated costs and total costs. PEG: Polyethylene glycol. FG: Fibrin glue.