Reducing Surgical Site Infection In Paediatric Neurosurgical Patients
C Huang, M Ramanan, R W Chaseling

Citation

Abstract

Background

Infection of the surgical site following insertion of external ventricular drains or ventriculoperitoneal shunts in paediatric neurosurgical patients is an important preventable complication that is associated with significant morbidity and mortality. The objective of this pilot study is to determine whether the infection rate following ventriculoperitoneal shunt and external ventricular drain insertion is reduced by the introduction of an evidence-based checklist that bundles together several simple interventions, compared to standard practice.

Methods

A checklist was developed utilizing the concept of “bundling” key evidence based components. Extensive interdepartmental consultation and literature searching was carried out in the process of developing the checklist. All relevant staff were educated in the use of the checklist. Compliance was monitored closely. During the study period from January 2008 to December 2009, the checklist was used for all patients undergoing ventriculoperitoneal shunt or external ventricular drain insertion. Patients who underwent these operations between January 2007 and December 2007 were used as controls.

Results

There were a total of 197 patients who underwent VPS or EVD insertion during the study period (Table 2). 67 patients formed the control group prior to introduction of the checklist and 130 patients were in the intervention group after introduction of the checklist. There were a total of 8 shunt or EVD infections in the cohort of 197 patients.
Reducing Surgical Site Infection in Paediatric Neurosurgical Patients

representing an overall rate of 4.1%. The infection rate was 7.5% (5 out of 67) in the control group and 2.3% (3 out of 130) in the intervention group. The absolute risk reduction of 5.2% did not reach statistical significance (p=0.08) with a 95% confidence interval ranging from a 12% reduction to a 1.6% increase. The odds ratio for developing a shunt or EVD infection following exposure to the checklist was 0.29 (95% confidence interval 0.068 to 1.265). The low number of patients and infections meant that this study was underpowered to detect a statistically significant effect.

Table 2
Summary of results

<table>
<thead>
<tr>
<th>Group</th>
<th>Infection (%)</th>
<th>No infection (%)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Checklist</td>
<td>3 (2.3)</td>
<td>127 (97.7)</td>
<td>130</td>
</tr>
<tr>
<td>No checklist</td>
<td>5 (7.5)</td>
<td>62 (92.5)</td>
<td>67</td>
</tr>
<tr>
<td>Overall</td>
<td>8 (4.1)</td>
<td>189 (95.9)</td>
<td>197</td>
</tr>
</tbody>
</table>

chi-squared=3.016, df=1, p=0.08
odds ratio=0.29 (95% confidence interval 0.07 to 1.27)

It was also found that the number of unplanned returns to the operating theatre dropped from 34 per year in the control period to 2 per year during the intervention period. The total number of additional days of hospitalisation due to SSI decreased from 65 days to 4 days per quarter. Overall compliance with the checklist was 88%.

DISCUSSION

The

CONCLUSION

The introduction of an evidence-based checklist resulted in a decrease in the rate of SSI in paediatric patients undergoing VPS or EVD insertion surgery when compared to historical controls treated without the checklist. Due to small numbers, the benefit did not reach statistical significance. The

References


2 of 4
Reducing Surgical Site Infection In Paediatric Neurosurgical Patients


Author Information

Christopher Huang
Neurosurgery Department The Canberra Hospital
Australia
rachliszt@hotmail.co

Mahesh Ramanan
Sydney Australia
maheshvarasharma@hotmail.com

Raymond W Chaseling, MBBS FRACS GradDipMed?
Sydney Australia
RaymonC2@chw.edu.au