The Impact of Hospital Surgical Volume on Healthcare Utilisation Outcomes after Paediatric Thyroidectomy

Alexander D Chesover¹, Antoine Eskander², Rebecca Griffiths³, Jesse D Pasternak⁴, Jason D Pole⁵, Nikolaus E Wolter⁶, Jonathan D Wasserman¹

(1) Division of Endocrinology, The Hospital for Sick Children and Department of Paediatrics, University of Toronto, Canada. (2) Division of Otolaryngology-Head & Neck Surgery, Sunnybrook Health Sciences Centre and Michael Garron Hospital, University of Toronto, Canada. (3) Institute for Clinical and Evaluative Sciences, Queen’s, Kingston, Canada. (4) Division of Surgery, University Health Network, Toronto, Canada. (5) Institute for Clinical and Evaluative Sciences, Toronto, Canada. (6) Division of Otolaryngology, The Hospital for Sick Children, Toronto, Canada.

BACKGROUND & CONTEXT

- Complications from thyroidectomy more common in children.
- High-volume surgeons associated with better outcomes.
- 25-30 thyroidectomies/year needed to maintain proficiency.
- Hospital volume is less frequently studied.

AIMS

1. To describe paediatric thyroidectomy patterns in Ontario.
2. To investigate relationships between hospital volume and healthcare utilisation outcomes following thyroidectomy.

METHODS

Retrospective analysis of administrative and health-related data, which is collected prospectively through ICES.

1. Patterns of Surgical Care: Annual Hospital Volume by Quartile

<table>
<thead>
<tr>
<th>Variable</th>
<th>Total (n=1908)</th>
<th>Hospital Volume Quartile</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 (n=589)</td>
<td>2 (n=364)</td>
</tr>
<tr>
<td>Thyroidectomies/year a</td>
<td>N/A</td>
<td>0</td>
</tr>
<tr>
<td>(median, range)</td>
<td>[0-1]</td>
<td>[2-4]</td>
</tr>
<tr>
<td>Number of Hospitals b</td>
<td>82</td>
<td>81</td>
</tr>
</tbody>
</table>

1. Number of thyroidectomies in the year preceding the patient’s thyroidectomy.  
† Over time, a hospital’s surgical volume may fall into more than one quartile.

RESULTS

1. Emergency department (ED) visit (within 30 days of surgery)

- Overall: 136/1908 (8.2%)
- No difference between hospital volumes
- Increased ED visit rate for:
  - Males: HR 1.68 [95% CI 1.16, 2.43; p<0.01]
  - Increased socioeconomic deprivation: HR 1.89 [95% CI 1.10, 3.27; p=0.0022]
  - Rurality: HR 2.48 [95% CI 1.38, 4.46; p<0.01]
- Implications: identify factors placing these groups at higher risk and consider measures to mitigate risk.

2. Healthcare Utilisation Outcomes

- High volume hospitals more likely to see: younger age, more co-morbidity and cancer.
- Low volume hospitals not associated with worse outcomes.

LIMITATIONS

- Surgeon volume and surgeon sub-specialty data not captured.
- Cannot determine clinical decision making.
- Long-term outcomes related to medical care not evaluated.

CONCLUSIONS

- Low hospital surgical volume not associated with poorer healthcare utilisation outcomes.
- High hospital surgical volume associated with:
  - Increased length of stay;
  - Lower likelihood of same day surgery;
  - Higher rate of ED visits in some groups.
- Referral pattern variation may reflect appropriate clinical decision making (increased case complexity at high-volume hospitals and no worse outcomes at low-volume hospitals).