Variation in the use of radiotherapy fractionation for breast cancer and cost implications

V Batumalai, GP Delaney, J Descallar, G Gabriel, K Wong, J Shafiq, M Barton

Background
Variation in practice may cause adverse effect on patient outcomes and impose unnecessary financial costs on the health system.

Aim
• To identify variation in radiotherapy fractionation in NSW breast cancer patients
• To identify factors associated with variation
• To estimate cost savings if patients were treated according to evidence-based guideline

Methods
NSW Central Cancer Registry data used:
- Patients who received breast radiotherapy
- 5 years examined: 2009-2013

Patients classified into 3 clinical groups [1]:
- Early (T1-2, N0-1, M0)
- Advanced (T3-4, Nx, M0 or Tx, N2-3, M0)
- Missing TNM

Cost estimated ($221/fraction) [2]:

<table>
<thead>
<tr>
<th>Fractionation</th>
<th>Estimated cost for this cohort</th>
<th>Optimal no. of fractions</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;2Gy/fraction</td>
<td>= Total no. fractions x $221</td>
<td>16.8 [1]</td>
</tr>
<tr>
<td>≤2Gy/fraction</td>
<td>= Optimal no. fractions x $221</td>
<td>15.1 [1]</td>
</tr>
</tbody>
</table>

*Missing stage analysed using the optimal no. of fractions for all breast cancer

Conclusion
• Large variation in breast radiotherapy fractionation
• Variation in practice by age, staging, sociodemographic, geographical and institutional factors

Results
10,569 patients analysed

Fractionation variation in breast radiotherapy

- Early (n=5753)
  - 61% >2Gy/fraction
  - 39% ≤2Gy/fraction
- Advanced (n=1259)
  - 85% >2Gy/fraction
  - 15% ≤2Gy/fraction
- Missing (n=3557)
  - 76% >2Gy/fraction
  - 24% ≤2Gy/fraction

Factors associated with increased use of >2Gy/fraction
- Increasing age
- Early stage clinical group (T1-2, N0-1, M0)
- Year of treatment (2013 higher than 2009)
- Local health district (wide spread of fractionation used)
- Lower socioeconomic status
- Inner/outer regional areas of residence
- Born in Australia

Estimated cost spent on this cohort = $52.1M
Estimated cost if using guideline = $38.5M
Cost savings = $13.6M

If this cohort of patients were treated with optimal number of fractions [1,3], the potential cost savings is $13.6M, a 26% reduction in breast radiotherapy costs.

Acknowledgement
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Reference

Use of evidence-based treatment illustrates potential cost reduction by 26% (~$13.6 million)