Perioperative Blood Conservation: A Nurse’s Perspective

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Perioperative Blood Conservation

- MOH - ONTraC
- Integral part of Transfusion Medicine
- Close links and support from surgery and anesthesia
Pre-Operative Role Of Coordinator

- Education
- Evaluation of the anemia
- Treatment of anemia
- Pre-Operative Autologous Blood Donation
- Re-Evaluation of Program Effectiveness
- Expansion of Program
Pre-Operative Role Of Coordinator

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### EPO: Efficacy

RCT, multi-centre, x 4 weekly doses starting 4 weeks before total joint arthroplasty

<table>
<thead>
<tr>
<th></th>
<th>Placebo (n=78)</th>
<th>20,000 U (n=79)</th>
<th>40,000 U (n=44)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retic. count</td>
<td>1.8 x10^9 cells/L</td>
<td>37 x10^9 cells/L</td>
<td>59 x10^9 cells/L</td>
</tr>
<tr>
<td>↑ Hb conc.</td>
<td>1.2 g/L</td>
<td>17.2 g/L</td>
<td>19.5 g/L</td>
</tr>
<tr>
<td>Transfusion rate</td>
<td>45% (n=35)</td>
<td>23% (n=18)</td>
<td>11% (n=5)</td>
</tr>
</tbody>
</table>

EPO: Clinical Effectiveness

At UHN:
- < 70 Kg: 20,000 IU; > 70 Kg: 40,000 IU
- skip day of surgery dose

Adequate iron stores required
- iron supplementation mandatory (oral or IV)
Clinical Experience in TJA Patients:

# of EPO Injections and Hb Response

TJA Patients at UHN 2000-2003; Hb <130 g/L (770/1611 or 48%)

<table>
<thead>
<tr>
<th></th>
<th>EPO</th>
<th>No EPO</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABT</td>
<td>16.4% (35/214)</td>
<td>56.1% (312/556)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Hb (g/L)</td>
<td>119.5 ± 12.0</td>
<td>118 ± 10</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td></td>
<td>135.6 ± 12.0</td>
<td>NC</td>
<td></td>
</tr>
<tr>
<td>Nadir Hb (g/L)</td>
<td>95.2 ± 13.7</td>
<td>83.1 ± 11.4</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Discharge Hb (g/L)</td>
<td>100 ± 10.3</td>
<td>96.5 ± 10.6</td>
<td>&lt;0.05</td>
</tr>
</tbody>
</table>

Clinical Experience in Anemic TJA Patients: PET and Blood Transfusion

EPO: Summary

- $\uparrow$ Hb levels by $15 \pm 10$ g/L
  - i.e., can potentially eliminate 1-2 unit transfusions
  - $>50\%$ reduction in allogeneic blood transfusion when compared to placebo

- **Benefits compared to PAD**
  - ↓ overall transfusion
  - ↓ postoperative anemia
  - more accessible
  - preferred by patients
  - predictable response
Pre-Operative Role Of Coordinator

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PAD

- Expansion of the RBC Mass
- No RCT-Double Blind Study
- ↑ Number of transfusions (Allo & PAD)
- Pre-Operative Anemia
- Needs to be managed to be cost effective
Multi-modality Blood Conservation in Spine Surgery at UHN

- n=15/21
- n=24/73
- n=9/52
- n=2/25

# of blood conservation modalities used (PAD +/- EPO +/- Cell Saver)
Pre-Operative Role Of Coordinator

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TJA New Data

- Overall Transfusion Data
- Preoperative Anemia
- Preoperative Autologous Blood Donation
### TJA Patients at UHN 2004-2005; Hb <130 g/L (866/1814 or 48%)

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<thead>
<tr>
<th></th>
<th>EPO</th>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>ABT</strong></td>
<td>25%</td>
<td>46%</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td></td>
<td>(46/147)</td>
<td>(172/446)</td>
<td></td>
</tr>
<tr>
<td><strong>Hb (g/L)</strong></td>
<td>118 ± 9</td>
<td>111 ± 20</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td></td>
<td>132 ± 12.0</td>
<td>NC</td>
<td></td>
</tr>
<tr>
<td><strong>Nadir Hb (g/L)</strong></td>
<td>89 ± 16</td>
<td>83 ± 14</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td><strong>Discharge Hb (g/L)</strong></td>
<td>99 ± 14</td>
<td>93 ± 14</td>
<td>&lt;0.0001</td>
</tr>
</tbody>
</table>

Evans  June 20, 2006.
Clinical Experience in Anemic TJA Patients: PET and Blood Transfusion

% Transfused

U/Pt Transfused

2000 - 2003
2004 - 2005

Evans June 2006.
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Gynecology/Oncology
Overall Transfusion Data
Jan 2002 - Mar 2004

Number of Procedures = 648

Procedures:
  TAH BSO
  Laparotomies

Overall Transfusion Rate = 15.5%
Transfusion Data

- Median # of units Tx = 2 units PRBC
- 25th percentile = 2 units PRBC
- 75th percentile = 4 units PRBC
- Mean # of Units Tx / Pt Tx
  \[ = 3.7 \pm 3.1 \text{ units} \]
# Base/Discharge Hgb Values

<table>
<thead>
<tr>
<th>Base Hgb Value</th>
<th>Mean Base Hgb g/L</th>
<th>Mean Discharge Hgb g/L</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 130</td>
<td>139 ± 7</td>
<td>112 ± 13.5</td>
</tr>
<tr>
<td>≤ 130</td>
<td>116 ± 12</td>
<td>100 ± 13</td>
</tr>
<tr>
<td>≤ 120</td>
<td>108 ± 11</td>
<td>97 ± 13</td>
</tr>
</tbody>
</table>
Blood Transfusions, Blood Alternatives and Transfusion Reactions

A Guide to Transfusion Medicine

Sponsored by: Ontario
Acknowledgments

- Dr. Stuart McCluskey
- Dr. Keyvan Karkouti