Management of anaemia in medical patients

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Anaemia Therapies

- Erythropoiesis-stimulating agents (ESAs)
- Intravenous iron
- Red cell transfusions
Many dialysis patients had “top-up” transfusions every 2–4 weeks
- Effects transient
- Increased risk of infections, *esp. viral*
- Sensitisation to HLA antigens – transplantation problematic
- Iron overload
Epoetin alfa (*Eprex*)
Epoetin beta (*NeoRecormon*)
Time Trend of Transfusions Rates and ESA Use in Hemodialysis Patients

Association of Hb Level and Total Blood Transfusions Over Time

- Inpatient and outpatient transfusions
- Hemoglobin

Patients Transfused per Quarter (%)

Hemoglobin (g/dL)

Year

1991 1993 1995 1997 1999 2001 2003 2005 2007
Correction of Anemia with Epoetin Alfa in Chronic Kidney Disease

Ajay K. Singh, M.B., B.S., Lynda Szczech, M.D., Kezhen L. Tang, Ph.D., Huirmam Barinart, Ph.D., Shelly Sapp, M.S., Marsha Wolfson, M.D., and Donal Reddan, M.B., B.S., for the CHOIR Investigators"
Red Cell Transfusions

- Darbepoetin alfa 297 (14.8%)
- Placebo 496 (24.5%)

HR: 0.56 (0.49-0.65)
P < 0.001
Safety Concerns in the TREAT Study

![Graph showing safety concerns in the TREAT Study](image)

**Patients (%)**

- **Stroke**
  - Darbepoetin alfa: 5.0†
  - Placebo: 2.6
- **Venous thromboembolic event**
  - Darbepoetin alfa: 2.0‡
  - Placebo: 1.1
- **Arterial thromboembolic event**
  - Darbepoetin alfa: 8.9§
  - Placebo: 7.1
- **Cancer-related mortality**
  - Darbepoetin alfa: 7.5‡
  - Placebo: 0.6

†, p<0.001 versus placebo
‡, p=0.02 versus placebo
§, p=0.04 versus placebo

*Amongst patients with a history of malignancy at baseline

Mean Hb levels fell 3.8% between 2009 and the first nine months of 2011, from 11.39 g/dL to 10.96 g/dL

19.2% drop in ESA doses and a 3.4% increase in use of IV iron

Associated increase from 0.030 to 0.036 transfusions per patient per month

Median Hb levels fell 0.08 g/dL between August 2010 and July 2011, and by an additional 0.37 g/dL through October 2011

Weekly ESA doses fell a median of 23% between Aug. 2010 and Dec. 2011

IV iron use steeply increased from 57% of patients receiving iron in 2010 to 77% in December 2011

2.21% of patients transfused in hospital per month in September 2010 increased to 4.87% in September 2011
ESA Treatment Effective in Reducing Transfusion Burden When Initiated at Hemoglobin < 10 g/dL

<table>
<thead>
<tr>
<th>Baseline Hemoglobin Categories in TREAT</th>
<th>Days Transfusion Received</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Placebo with rescue at day 1</td>
<td>30%</td>
</tr>
<tr>
<td>Darbepoetin alfa</td>
<td>20%</td>
</tr>
<tr>
<td>Placebo</td>
<td>10%</td>
</tr>
<tr>
<td>Darbepoetin alfa</td>
<td>5%</td>
</tr>
<tr>
<td>Placebo</td>
<td>2%</td>
</tr>
<tr>
<td>Darbepoetin alfa</td>
<td>1%</td>
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</table>

<table>
<thead>
<tr>
<th>N</th>
<th>Placebo</th>
<th>Darbepoetin alfa</th>
</tr>
</thead>
<tbody>
<tr>
<td>138</td>
<td>168</td>
<td></td>
</tr>
<tr>
<td>Baseline Hb</td>
<td>487</td>
<td>416</td>
</tr>
<tr>
<td>9 to &lt; 10 g/dL</td>
<td>1401</td>
<td>1438</td>
</tr>
</tbody>
</table>

Baseline Hb < 9 g/dL

Baseline Hb 9 to < 10 g/dL

Baseline Hb ≥ 10 g/dL
Conclusions / Action points

- ESA therapy has unquestionably reduced transfusion need in renal patients since their introduction in 1990

- There is preliminary evidence of a swing back to increased transfusion use following the publication of the TREAT study

- The trigger Hb for transfusion in chronic anaemia and pre-operatively remains highly variable among physicians

- There is a pressing need for further research and scientific evaluation of the effects of blood transfusion in CKD patients
Conclusions / Action points

**Oncology setting**

- Only to be used for *chemotherapy-induced* anaemia
- Huge “nervousness” about the use of ESA therapy in oncology
- Increased venous thromboembolism / increased tumour growth?