Analysis of the Usage of Platelet Products at Groote Schuur Hospital, Cape Town, South Africa

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Western Province Blood Transfusion Service (WPBTS)
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Background

- Platelet product transfusions are prescribed for the treatment or prevention of bleeding due to reduced platelet numbers or abnormal function.
- Indications for platelet transfusions are described in local blood transfusion guidelines.
  - Audit at Universitas Hospital, Bloemfontein (2014) showed 34% compliance with local platelet transfusion guidelines.
  - National audit in UK (2007) showed 57% compliance with platelet transfusion guidelines.
# Background

<table>
<thead>
<tr>
<th></th>
<th><strong>Random Donor Platelet (RDP) Product</strong></th>
<th><strong>Single Donor Platelet (SDP) Product</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mode of collection</strong></td>
<td>Pooling of four buffy coats and one plasma unit from whole blood donations</td>
<td>Platelet collection from a single donor by apheresis technique</td>
</tr>
</tbody>
</table>
| **Donor exposure to patient** | Four donors  
*higher risk of platelet alloimmunisation and infection risk | One donor |
| **Indication for use**  | Acute thrombocytopenia | Chronic platelet transfusion needs |
| **Cost**  
(State price at time of study) | R6233.00  
R7430.00 (leucocyte reduced RDP) | R8364.00 |
Background

Groote Schuur Hospital (GSH), Cape Town
• 975 bed tertiary facility with a large Haematology Department and stem cell transplant facility
• Active Blood Users’ Committee
Background

Platelet Product Expenditure (ZAR) at GSH 2013-2017

Platelet Products Used at GSH 2013-2017

Data obtained from WPBTS Financial Reports for Groote Schuur Hospital
Aim

- Audit the usage of platelet products at Groote Schuur Hospital to establish whether these products are being used appropriately

Study Method

- Scrutiny of 150 consecutive blood ordering request forms for platelet products (17.01.17 - 14.04.17)
- Analysis of participating patient platelet results obtained from the National Health Laboratory Service (NHLS)
- Ethics approval obtained from the University of Cape Town and Groote Schuur Hospital human research ethics committees
**Description of Study**

WPBTS Blood Ordering Request Form

**Requirements for correct completion of the form**
- Legible patient details
- Ward
- Diagnosis
- Platelet count
- Clinician’s contact number
- Product request
Results

- Average patient age - **38 years**
- Male to female ratio - **60:40**
- Total number of platelet products ordered - **194**
  - 1.3 products ordered per patient
Results - Departmental platelet product usage

Overall Percentage Use by GSH Department

- Haematology/Oncology: Highest usage
- Internal Medicine: Medium usage
- Trauma: Medium usage
- Obstetrics: Low usage
- Neurosurgery: Low usage
- Medical Casualty: Low usage
- Adolescents: Lowest usage
- General Surgery: Lowest usage
- Cardiothoracics: Lowest usage
- Intensive Care: Low usage

Percentage Use
Results - Overall platelet product usage

Platelet Product Type Usage

- RDP Units: 55.7%
- SDP Units: 35.0%
- Leucocyte Reduced RDP Units: 9.3%
Results - RDP product usage

Platelet Product Type Usage

- RDP Units: 55.7%
- SDP Units: 35.0%
- Leucocyte Reduced RDP Units: 9.3%

Top RDP Users
1. Trauma (27.8%)
2. Intensive Care (17.6%)
3. Cardiothoracics (10.1%)
4. Haematology (10.1%)
5. Obstetrics (9.2%)
Results - SDP product usage

Top SDP Users
1. Haematology (88.2%)
2. Internal Medicine (2.9%)
3. Intensive Care (2.9%)

Platelet Product Type Usage
- RDP Units
- SDP Units
- Leucocyte Reduced RDP Units

- 55.7% RDP Units
- 35.0% SDP Units
- 9.3% Leucocyte Reduced RDP Units
Results - LR RDP product usage

Top LR RDP Users
1. Haematology (55.6%)
2. Intensive Care (22.2%)
3. Internal Medicine (22.2%)

Platelet Product Type Usage

- RDP Units: 55.7%
- SDP Units: 35.0%
- Leucocyte Reduced RDP Units: 9.3%
# Results - Distribution of actual platelet counts per medical departments for transfused patients

<table>
<thead>
<tr>
<th>Department</th>
<th>Mean</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Haematology (n=64)</td>
<td>17.2</td>
<td>1</td>
<td>57</td>
</tr>
<tr>
<td>Intensive Care (n=24)</td>
<td>64.8</td>
<td>5</td>
<td>268</td>
</tr>
<tr>
<td>Internal Medicine (n=14)</td>
<td>85.3</td>
<td>1</td>
<td>227</td>
</tr>
<tr>
<td>Medical Casualty (n=7)</td>
<td>37.6</td>
<td>2</td>
<td>187</td>
</tr>
</tbody>
</table>
## Results - Distribution of actual platelet counts per surgical department for transfused patients

<table>
<thead>
<tr>
<th>Department</th>
<th>Mean</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trauma (n=31)</td>
<td>61.9</td>
<td>34</td>
<td>260</td>
</tr>
<tr>
<td>Cardiothoracics (n=16)</td>
<td>230</td>
<td>45</td>
<td>662</td>
</tr>
<tr>
<td>Neurosurgery (n=5)</td>
<td>13.4</td>
<td>9</td>
<td>16</td>
</tr>
<tr>
<td>Obstetrics (n=11)</td>
<td>77</td>
<td>16</td>
<td>176</td>
</tr>
<tr>
<td>General Surgery (n=4)</td>
<td>41.3</td>
<td>38</td>
<td>51</td>
</tr>
</tbody>
</table>

Platelet count (x $10^9/l$)
Results - Haematology department platelet product usage

Distribution of Platelet Counts for Haematology Patients

Platelet Count (x10^9/L)

Study Participants
Results - Correct completion of ordering form

- **35.3%** of forms were filled out correctly
- Misnomer of ‘mega’s’ used on 8 request forms
Conclusions

• Appropriate use of platelet products was confirmed at Groote Schuur Hospital over the study period
  • The unofficial ‘gate-keeping’ function of the GSH Blood Bank staff is acknowledged
• Platelet count transfusion thresholds were generally higher than prescribed by local transfusion service guidelines
• Correct completion of blood ordering request forms needs to be addressed
Authors’ comments

• Incentive to perform similar audits at other large hospitals
• Education of clinical staff regarding restrictive blood product usage, use of leucocyte reduced RDP and avoidance of misnomers will be promoted
• Recognition of the value of an active hospital Blood Users’ Committee
Acknowledgment and references

Thanks to Dr Greg Bellairs, Kevin de Smidt (WPBTS IT data analyst), Thomas Papo (NHLS data analyst) and the Groote Schuur Blood Bank staff for their assistance in this study.