Allogeneic Bone Marrow Transplantation In SAA: Current results and Expanding donor possibilities

Professor Gérard Socié, MD, PhD
Saint Louis Hospital, Paris

ASH Educational Session
New Orleans December 2013
Overview

Transplantation from an HLA-identical sibling Donor:
- Stem cell source; Bone marrow
- Conditioning regimen; Cy- ATG
- GvHD prophylaxis; CsA + MTX

- Is that so simple?
  ✓ Age effect
  ✓ Chimerism issue
  ✓ Long-term complications

Transplantation from an Unrelated Donor:
- Current results
- Conditioning regimen

Conclusions: Take home messages
Allogeneic Transplantation for SAA: Current Results and Expanding Donor Possibilities

![Graph showing survival probability over time for BM (N = 722) and PB (N = 151) stem cell sources with a p-value of 0.02.]

Stem cell source; Bone marrow

Blood 2007; 110:1397
Allogeneic Transplantation for SAA: Current Results and Expanding Donor Possibilities

Stem cell source; Bone marrow

Chronic GVHD

PB (N = 114)

BM (N = 620)

P = 0.05

Blood 2007; 110:1397
Allogeneic Transplantation for SAA: Current Results and Expanding Donor Possibilities

Stem cell source; Bone marrow

B

Probability, %

Months

BM, ≤20 yrs, Prob = 85%
PB, ≤20 yrs, Prob = 73%
BM, >20 yrs, Prob = 64%
PB, >20 yrs, Prob = 52%

=<20 years (RR 2.4) p=0.02

>20 years (RR 1.2) p=0.1

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Blood 2007; 110:1397
Allogeneic Transplantation for SAA: Current Results and Expanding Donor Possibilities

Stem cell source; Bone marrow

AGE < 20

BM = 656
PB = 234
P < 0.00001

AGE > 20

BM = 507
PB = 489
P = 0.001

BM = 656

PB = 234

BM = 507

PB = 489

Haematologica 2012;97:1142-1148

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![Graph showing comparisons between BM, PBSC, and CB](image-url)
Bone marrow transplantation for severe aplastic anemia: a randomized controlled study of conditioning regimens

Richard E. Champlin, Wael ISA S. Perez, Jakob R. Passweg, John P. Klein, Bruce M. Camitta, Eliane Gluckman, Christopher N. Bredeson, Mary Eapen, and Mary M. Horowitz

M. D. Anderson Cancer Center, Houston, TX; Center for International Blood and Marrow Transplant Research, Medical College of Wisconsin, Milwaukee; Hôpitaux Universitaires, Genève, Switzerland; Medical College of Wisconsin, Milwaukee; Hospital St Louis, Paris, France
Allogeneic Transplantation for SAA: Current Results and Expanding Donor Possibilities

Cyclosporin A and short-term methotrexate versus cyclosporin A as graft versus host disease prophylaxis in patients with severe aplastic anemia given allogeneic bone marrow transplantation from an HLA-identical sibling: results of a GITMO/EBMT randomized trial

GvHD prophylaxis; CsA + MTX

(Blood. 2000;96:1690-1697)

Figure 2. Probability of survival. Cumulative probability of survival for the CsA group (dotted line) and the CsA/MTX group (continuous line) is shown. N, number of patients in each arm of randomization; EV, number of events occurring in each arm of randomization.
Allogeneic Transplantation for SAA: Current Results and Expanding Donor Possibilities

Is that so simple?
✓ Age effect

N = 1307
< 20 years; n = 717
20-40; n = 506
> 40 years; n = 84

P<0.001
Allogeneic Transplantation for SAA: Current Results and Expanding Donor Possibilities

Is that so simple? Age effect

A

< 114 days from diagnosis; n = 941
≤ 114 days from diagnosis; n = 945

84%
72%

P < 0.0001

B

Age < 20, n = 996
Age ≥ 20, n = 890

87%
70%

P < 0.0001

C

CY 200; n = 1244
Other conditioning; n = 642

80%
72%

P < 0.0004

D

ATG in conditioning; n = 747
No ATG in conditioning; n = 1139

84%
74%

P < 0.0004
Allogeneic Transplantation for SAA: Current Results and Expanding Donor Possibilities

Is that so simple?
Age effect
Allogeneic Transplantation for SAA: Current Results and Expanding Donor Possibilities

Footnote to Figure 1. Relative risk of death in patients older than 30 years receiving a Flu-based (n=30) vs. standard (Cy±ATG) HSCT (n=239) from an HLA-matched sibling donor for severe aplastic anemia.

<table>
<thead>
<tr>
<th>Risk factors</th>
<th>Relative risk</th>
<th>No adjustment</th>
<th>95% CI</th>
<th>p</th>
<th>Adjusted for recipient age</th>
<th>Relative risk</th>
<th>95% CI</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conditioning regimen</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standard</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fludarabine-based</td>
<td>0.55</td>
<td>0.21-1.26</td>
<td>NS</td>
<td>0.44</td>
<td>0.44</td>
<td>0.20-0.97</td>
<td>0.04</td>
<td></td>
</tr>
<tr>
<td>Recipient age*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.040</td>
<td>1.015-1.065</td>
<td>0.002</td>
<td></td>
</tr>
</tbody>
</table>

*as a continuous variable.
Serial chimerism analyses indicate that mixed haemopoietic chimerism influences the probability of graft rejection and disease recurrence following allogeneic stem cell transplantation (SCT) for severe aplastic anaemia (SAA): indication for routine assessment of chimerism post SCT for SAA.

N= 91 Serial chimerism analyses

(A) Complete donor chimeras (n = 39),
(B) Transient mixed chimeras (n = 15)
(C) Stable mixed chimeras (n = 18),
(D) Progressive mixed chimeras (n = 14)
(E) Recipient chimeras with early graft rejection (n = 5)

Progressive mixed chimeras:
high risk of late graft rejection (n = 10, P < 0.0001).
Monitoring of chimeric status during cyclosporine withdrawal

Donor-derived

Recipient-derived

Increase CsA!

This is not a Leukemia

Is that so simple?
Chimerism issue
Allogeneic Transplantation for SAA: Current Results and Expanding Donor Possibilities

Is that so simple? Long-term issue

```
Years since Chronic GVHD onset

0.00 0.25 0.50 0.75 1.00

Death with Chronic GVHD
Continuing Chronic GVHD

0.14 0.11
```

Blood 1998;91:3637-3645
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Is that so simple?
Long-term issue

Cy-ATG
Marrow
CsA + MTX

HLA-identical sibling

N. at risk
61 53 38 35 33 30 28
**Allogeneic Transplantation for SAA:**
Current Results and Expanding Donor Possibilities

**HLA-identical sibling**

Is that so simple?
Long-term issue

<table>
<thead>
<tr>
<th>Event</th>
<th>N. events</th>
<th>At 3 months</th>
<th>At 24 months</th>
<th>At 72 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Viral infection</td>
<td>35</td>
<td>43% (30-55)</td>
<td>49% (36-61)</td>
<td>61% (46-73)</td>
</tr>
<tr>
<td>Bacterial infection</td>
<td>16</td>
<td>16% (8-27)</td>
<td>25% (15-36)</td>
<td>25% (15-36)</td>
</tr>
<tr>
<td>Fungal infection</td>
<td>5</td>
<td>7% (2-15)</td>
<td>8% (3-17)</td>
<td>8% (3-17)</td>
</tr>
<tr>
<td>Parasitic infection</td>
<td>2</td>
<td>--</td>
<td>4% (1-12)</td>
<td>4% (1-12)</td>
</tr>
<tr>
<td>Osteonecrosis</td>
<td>10</td>
<td>--</td>
<td>10% (4-20)</td>
<td>21% (10-36)</td>
</tr>
<tr>
<td>Endocrine dysfunction</td>
<td>12</td>
<td>--</td>
<td>10% (4-20)</td>
<td>19% (9-31)</td>
</tr>
<tr>
<td>Cardiovascular compl.</td>
<td>1</td>
<td>--</td>
<td>2% (0-9)</td>
<td>2% (0-9)</td>
</tr>
<tr>
<td>Secondary cancer</td>
<td>1</td>
<td>--</td>
<td>0% (0-0)</td>
<td>2% (0-11)</td>
</tr>
<tr>
<td>Non-invasive carcinoma</td>
<td>4</td>
<td>--</td>
<td>4% (1-11)</td>
<td>6% (2-16)</td>
</tr>
</tbody>
</table>
Allogeneic Transplantation for SAA: Current Results and Expanding Donor Possibilities

Is that so simple?
Long-term issue

Table 6. Pregnancies after transplantation

<table>
<thead>
<tr>
<th>Preparative regimen</th>
<th>CY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>73</td>
</tr>
<tr>
<td>Male*</td>
<td>58</td>
</tr>
<tr>
<td>Prebirth</td>
<td>1</td>
</tr>
<tr>
<td>Total evaluable pregnancies</td>
<td>73</td>
</tr>
<tr>
<td>Live births, n (%)</td>
<td>1</td>
</tr>
<tr>
<td>Abortions</td>
<td></td>
</tr>
<tr>
<td>Spontaneous</td>
<td>7</td>
</tr>
<tr>
<td>Stillbirth</td>
<td>1</td>
</tr>
<tr>
<td>Elective</td>
<td>4</td>
</tr>
<tr>
<td>Tubal pregnancy</td>
<td>1</td>
</tr>
<tr>
<td>Birth defects</td>
<td>1</td>
</tr>
</tbody>
</table>
Allogeneic Transplantation for SAA: Current Results and Expanding Donor Possibilities

Table 4. Risk factors for chronic GVHD among 1-year survivors

<table>
<thead>
<tr>
<th></th>
<th>Univariate</th>
<th></th>
<th></th>
<th>Multivariate</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>HR (95% CI)</td>
<td>P</td>
<td>HR (95% CI)</td>
<td>P</td>
<td></td>
</tr>
<tr>
<td>Acute GVHD prophylaxis</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single agent</td>
<td>1.0</td>
<td></td>
<td></td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td>Multiple agents</td>
<td>1.47 (0.8-2.7)</td>
<td>.22</td>
<td></td>
<td>2.13 (1.1-4.2)</td>
<td>.04</td>
</tr>
<tr>
<td>Buffy coat</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>1.0</td>
<td></td>
<td>1.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>2.13 (1.1-4.2)</td>
<td>.04</td>
<td>2.79 (1.3-5.8)</td>
<td>.01</td>
<td></td>
</tr>
<tr>
<td>Regimen</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cyclophosphamide</td>
<td>1.0</td>
<td></td>
<td></td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td>TBI, low (2-6 Gy)</td>
<td>1.18 (0.4-3.4)</td>
<td>.02</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TBI, high (10-12 Gy)</td>
<td>3.68 (1.7-8.1)</td>
<td>.02</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Donor</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Matched related</td>
<td>1.0</td>
<td></td>
<td>1.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mismatched related</td>
<td>5.96 (2.1-14)</td>
<td>.01</td>
<td>6.98 (2.6-19)</td>
<td>.004</td>
<td></td>
</tr>
<tr>
<td>Unrelated</td>
<td>1.53 (0.6-3.7)</td>
<td>.01</td>
<td>1.98 (0.8-4.9)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Outcome of Aplastic Anemia in adolescence. A survey of the Severe Aplastic Anemia Working Party (SAAWP) of the European Blood and Bone Marrow Transplant Group (EBMT).

Multivariate analysis, diagnosis to treatment ≤2 months IST alone negatively affected EFS.

In transplanted patients, diagnosis-treatment ≤2 months, first line MFD and BM provided a significant advantage in OS and EFS.
Allogeneic Transplantation for SAA: Current Results and Expanding Donor Possibilities

IST vs. Allogeneic SCT in patient over the age of 40 (in patient with an HLA-identical sibling donor)

Interval Diagnosis/HSCT; 240 days
Previous IST (?)

% causes death

G Socié, & A Bacigalupo
Unpublished results

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IST vs. Allogeneic SCT (in patient without an HLA-identical sibling donor)

Current results do not support UD-BMT as first line therapy
Allogeneic Transplantation for SAA: Current Results and Expanding Donor Possibilities

![Graph showing results for identical sibling and unrelated donors](image-url)
Unrelated stem cell transplantation for severe acquired aplastic anemia: improved outcome in the era of high-resolution HLA matching between donor and recipient

Sébastien Maury, Marie-Lorraine Balère-Appert, Zina Chir, Jean-Michel Boiron, Claire Galambrun, Karima Yakouben, Pierre Bordigoni, Aude Marie-Cardine, Noel Milpied, Judith Kanold, Natacha Maillard, Gérard Socié on behalf of the French Society of Bone Marrow Transplantation and Cellular Therapy (SFGM-TC)

Overall survival

N= 52
1999-2004

N= 37
1989-1998

p= 0.009
Allogeneic Transplantation for SAA: Current Results and Expanding Donor Possibilities

Cumulative incidence

A

Graft failure

Months

0 10 15 20

0 20 40 60 80 100

B

Acute GVHD grades II-IV

Acute GVHD grades III-IV

Days

20 40 60 80 100

0 20 40 60 80 100

Haematologica 2007;92:589-596

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Allogeneic Transplantation for SAA: Current Results and Expanding Donor Possibilities

Table 3. Relative risk of death after HSCT from an unrelated donor for SAA between 1989 and 2004.

<table>
<thead>
<tr>
<th>Risk factors</th>
<th>No adjustment</th>
<th>Adjusted for related variables</th>
<th>Adjusted for related variables including HLA matching</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Relative Risk</td>
<td>95% CI</td>
<td>Relative Risk</td>
</tr>
<tr>
<td>Year of transplant before or in 1998</td>
<td>2.12*</td>
<td>1.22-3.68</td>
<td>3.95*</td>
</tr>
<tr>
<td>Patient age &gt;17 years</td>
<td>2.92*</td>
<td>1.53-5.57</td>
<td>5.14*</td>
</tr>
<tr>
<td>Sex mismatch</td>
<td>1.17</td>
<td>0.67-2.06</td>
<td>1.48</td>
</tr>
<tr>
<td>Interval diagnosis-HSCT &lt; 1 year</td>
<td>1.13</td>
<td>0.62-2.06</td>
<td>2.16*</td>
</tr>
<tr>
<td>Cell dose ≤2.6×10⁶ nucleated cells/kg</td>
<td>1.00</td>
<td>0.99-1.01</td>
<td>1.00</td>
</tr>
<tr>
<td>Irradiation-based conditioning</td>
<td>1.00</td>
<td>0.98-1.03</td>
<td>1.01</td>
</tr>
<tr>
<td>No serotherapy in conditioning</td>
<td>2.02*</td>
<td>1.07-3.82</td>
<td>1.23</td>
</tr>
<tr>
<td>No fludarabine in conditioning</td>
<td>1.17</td>
<td>0.49-2.81</td>
<td>1.55</td>
</tr>
<tr>
<td>HLA allelic matching /10 loci</td>
<td>2.91*</td>
<td>1.37-6.20</td>
<td></td>
</tr>
</tbody>
</table>

*p<0.05; †p<0.01; ‡p<0.001.
Allogeneic Transplantation for SAA: Current Results and Expanding Donor Possibilities

Unrelated donor transplants 1971-2009
Stratified according to ATG in the conditioning (yes/ no)

Matched Unrelated

ATG n= 521
67%

No ATG n= 489
55%

P=0.001

Unpublished data
Allogeneic Transplantation for SAA:
Current Results and Expanding Donor Possibilities

Original Articles

Fludarabine, cyclophosphamide, antithymocyte globulin, with or without low dose total body irradiation, for alternative donor transplants, in acquired severe aplastic anemia: a retrospective study from the EBMT-SAA working party

Andrea Bacigalupo, Gerard Socie, Edoardo Lanino, Arcangelo Prete, Franco Locatelli, Anna Locasciulli, Simone Cesaro, Avichai Shimon, Judith Marsh, Mats Brune, Maria Teresa Van Lint, Rosi Oneto, and Jacob Passweg

for the Severe Aplastic Anemia Working Party of the European Group for Blood and Marrow Transplantation (SAA WP-EBMT)

FCA regimen:
**Fludarabine** 30 mg/m² on days -6, -5, -4, and -3,
**Cyclophosphamide** 300 mg/m² on days -6, -5, -4, and -3,
**Antithymocyte globulin** 3.75 mg/kg on days -6, -5, -4, and -3.

FCA-TBI regimen:
**Fludarabine** 30 mg/m² on days -6, -5, -4, and -3,
**Cyclophosphamide** 300 mg/m² on days -6, -5, -4, and -3,
**Antithymocyte globulin** 3.75 mg/kg/on days -4 and -3
**TBI** 2 Gy.

**GvHD prophylaxis**
**cyclosporine A and methotrexate** (days +1, +3, and +6)
Allogeneic Transplantation for SAA: Current Results and Expanding Donor Possibilities

GS – ASH 2013 Haematologica 2010;95:976-982
Allogeneic Transplantation for SAA: Current Results and Expanding Donor Possibilities

A

FCA

![Graph A: FCA Survival](image)

- Age ≤ 3 years; n= 26
  - Survival: 87%
- Age > 13 years; n= 26
  - Survival: 60%

P = 0.03

B

FCA-TBI

![Graph B: FCA-TBI Survival](image)

- Age ≤ 27 years; n= 24
  - Survival: 79%
- Age > 27 years; n= 24
  - Survival: 78%
Multivariate analysis:

(i) Interval between diagnosis and transplantation ($P=0.001$), RR = 4.4 for patients grafted more than 2 years after diagnosis

(ii) Transplantation after 2004 ($P=0.056$, RR 0.33).
Overall outcome of 201 patients assigned to second-line therapy.
Allogeneic Transplantation for SAA: Current Results and Expanding Donor Possibilities

Blood 2008;111:1054-1059
CURRENT OUTCOME OF HLA IDENTICAL SIBLING vs. UNRELATED DONOR TRANSPLANTS IN SEVERE APLASTIC ANEMIA: an EBMT analysis.
Andrea Bacigalupo, Gérard Socié, Hubert Schrezenmeier, et al,

**Cox analysis on survival**

<table>
<thead>
<tr>
<th></th>
<th>RR</th>
<th>CI</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BM vs. PB</strong></td>
<td>2.0</td>
<td>1.4-2.5</td>
<td>0.000001</td>
</tr>
<tr>
<td>Diagnosis/ HSCT &lt; 180 days</td>
<td>1.6</td>
<td>1.2-2.5</td>
<td>0.0006</td>
</tr>
<tr>
<td><strong>Age &gt;20</strong></td>
<td>1.6</td>
<td>1.2-2.0</td>
<td>0.002</td>
</tr>
<tr>
<td><strong>ATG no</strong></td>
<td>1.3</td>
<td>1.06-1.7</td>
<td>0.01</td>
</tr>
<tr>
<td><strong>SIB vs. UD</strong></td>
<td>1.2</td>
<td>0.9-1.6</td>
<td>0.4</td>
</tr>
</tbody>
</table>
Allogeneic Transplantation for SAA: Current Results and Expanding Donor Possibilities

Survival

Days from transplant

0-1 neg pred 88%
2-3 neg pred 70%
4 neg pred 46%

Actuarial Survival

Days from transplant

BM 80%
PB 66%

P<0.001

ASH December 2013
### Causes of death

<table>
<thead>
<tr>
<th>Source</th>
<th>SIBS</th>
<th>UDs</th>
</tr>
</thead>
<tbody>
<tr>
<td>n=</td>
<td>975</td>
<td>525</td>
</tr>
<tr>
<td>Alive</td>
<td>825 (85)</td>
<td>414 (79)</td>
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</tbody>
</table>

#### Causes of death

<table>
<thead>
<tr>
<th>Cause</th>
<th>SIBS</th>
<th>UDs</th>
</tr>
</thead>
<tbody>
<tr>
<td>GvHD</td>
<td>3.4%</td>
<td>5.9%</td>
</tr>
<tr>
<td>IP</td>
<td>0.3%</td>
<td>1.3%</td>
</tr>
<tr>
<td>Infections</td>
<td>8.4%</td>
<td>10.1%</td>
</tr>
<tr>
<td>Rejection</td>
<td>1.4%</td>
<td>1.7%</td>
</tr>
<tr>
<td>Hemorrhage</td>
<td>0.8%</td>
<td>0.6%</td>
</tr>
</tbody>
</table>
Conclusions: Take home messages

Severe Aplastic Anemia

- HLA-identical sibling D
  - HSCT
  - Marrow /Cy + ATG /CsA MTX
  - Unresolved issue; Older age

- No sibling D
  - ATG + CsA
  - Failure /Relapse
  - 10/10 (8/8 matched UD)
  - HSCT in young patient
    - Age limit?
  - No UD
    - Repeated IST
    - Investigational Drug
    - HSCT / Alternative Donor

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Unrelated Cord Blood Transplantation for Severe Aplastic Anemia


(n=31)

Influence of Nucleated Cell Dose on Overall Survival of Unrelated Cord Blood Transplantation for Patients with Severe Acquired Aplastic Anemia: A Study by Eurocord and the Aplastic Anemia Working Party of the European Group for Blood and Marrow Transplantation


(n=71)

GS – ASH 2013  Yoshimi et al, BBMT 2008; Peffault de Latour et al, BBMT 2010
### Characteristics

<table>
<thead>
<tr>
<th></th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAA or vSAA</td>
<td>62 (87%)</td>
</tr>
<tr>
<td>AA-PNH syndrome</td>
<td>9 (13%)</td>
</tr>
<tr>
<td>Previous IST (all patients)</td>
<td>55 (89%)</td>
</tr>
<tr>
<td>Interval between DG and UCBT (months)</td>
<td>14 (2-140)</td>
</tr>
<tr>
<td>&gt;20 RBC</td>
<td>35 (56%)</td>
</tr>
<tr>
<td>&gt;20 platelets transfusions</td>
<td>42 (67%)</td>
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</table>
Allogeneic Transplantation for SAA: Current Results and Expanding Donor Possibilities

Overall survival

3-year OS: 38% ± 6%

Neutrophils recovery

37/71 Pts (52%, 25 days)
Unrelated peripheral blood stem cell transplantation with ‘megadoses’ of purified CD34+ cells in three children with refractory severe aplastic anemia \( n=3 \)

Haploidentical transplants \( n=3 \)

Effective donor lymphohematopoietic reconstitution after haploidentical CD3: refract Case report \( n=1 \)

Successful transplant sibling in the fetus \( n=1 \)

Reduced intensity HLA-haploidentical BMT with post transplantation cyclophosphamide in nonmalignant hematologic diseases \( n=3 \)

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Letter to the Editor

Hapl Puril Conc Apla

Bone Marrow Transplantation (2008) 42, 523–527

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Letter to the Editor

Hapl Puril Conc Apla

Bone Marrow Transplantation (2004) 34, 267–269

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Letter to the Editor

Hapl Puril Conc Apla

Bone Marrow Transplantation (2000) 25, 513–517
Allogeneic Transplantation for SAA: Current Results and Expanding Donor Possibilities

Conditioning regimen:
> Fludarabine, 120mg/m²
> Endoxan, 120mg/Kg
> ATG, 5 mg/Kg
> TBI 2 Gy

APCORD (SFGM-TC)

- UCB #1
- UCB #2

4-6/6 HLA-match UCB
TNCc: 4 x 10⁷/kg

Anti CD20: 150mg/m² (D5)
G-CSF (D5)
Don’t forget what supportive care can do with non responders to Immunosuppressive therapy!

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<td></td>
<td>174</td>
<td>43</td>
<td>51</td>
<td>80</td>
</tr>
</tbody>
</table>

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**HSCT censored**

Non-responders to IST N=174

P < 0.001

5-yr survival = 57%

**HSCT not censored**

Non-responders to IST N=174

P < 0.001

5-yr survival = 68%

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Valdez et al, CID 2011