ALLOGENEIC HEMATOPOIETIC CELL TRANSPLANTATION for MULTIPLE MYELOMA

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Hematopoietic Stem Cell

Bone marrow

Stem cell

White blood cells (lymphocytes, neutrophils and other types)

Red blood cells (erythrocytes)

Platelets (thrombocytes)
Autologous vs. Allogeneic Transplant

**Autologous**

- Autologous stem cell collection
- Freeze Stem Cells
- Thaw + transplant

**Allogeneic**

- Tissue or HLA matched
- Stem cell donor
- Allogeneic stem cell collection
- Conditioning regimen
- transplanted
Right Treatment for the Right Patient at the Right Time

Allogeneic **Hematopoietic Cell Transplantation**
a.k.a **Stem Cell** Transplantation
a.k.a **Bone Marrow** Transplantation (BMT)

Refers to the way (hematopoietic) stem cell are harvested/collected
Allogeneic Transplant has been around for 5 decades

Allogeneic Transplant is IMMUNOTHERAPY
May not be as refined and precise as the more modern versions but it works
Indications for Hematopoietic Cell Transplantation in the US in 2014 (CIBMTR)
Allogeneic Transplant: Who can be a donor?

1. “Matched” Sibling

2. “Matched” Unrelated Volunteer adult donor

3. Partially Mis-matched (“Half-matched”) Sibling, Child or Parent

4. Cord blood
## Probability of Finding a Matched Unrelated Donor

<table>
<thead>
<tr>
<th></th>
<th>Likelihood of Identifying a Matched Unrelated Donor (%)</th>
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<tbody>
<tr>
<td>White European</td>
<td>75</td>
</tr>
<tr>
<td>African-Americans</td>
<td>16</td>
</tr>
<tr>
<td>Chinese</td>
<td>41</td>
</tr>
<tr>
<td>Hispanics</td>
<td>34</td>
</tr>
</tbody>
</table>

Allogeneic Transplant: How to select a donor?

- Matched Sibling Available?
  - Yes: Go To Transplant
  - No: Matched Unrelated donor available?
    - Yes: Haploidentical ("half-matched") family donor available?
      - Yes: Go To Transplant
      - No: Cord blood transplant
    - No: Chemotherapy

- Matched Sibling Available?
  - Yes: Go To Transplant
  - No: Matched Unrelated donor available?
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      - Yes: Go To Transplant
      - No: Cord blood transplant
    - No: Chemotherapy
Allogeneic Transplant: Limitations

Requires a donor

Higher mortality (10-20%)

Morbidity (rejection, infections, Graft-versus-Host Disease)

Patients need long-term anti-rejection medications

Theoretically curative: Risk of relapse is there! May still need treatment for Myeloma

Expensive!
Trend in Allogeneic Transplants by Patient Age (CIBMTR)
Trends in Allogeneic Transplants by Patient Age (CIBMTR)

*Transplants for AML, ALL, NHL, Hodgkin Disease, Multiple Myeloma*
Right Treatment for the Right Patient at the Right Time

Revised International Staging System for Multiple Myeloma: A Report From International Myeloma Working Group

Antonio Palumbo, Herve Ave-L泥eaux, Stefania Oliva, Henk M. Lekhorst, Hartmut Goldschmidt

<table>
<thead>
<tr>
<th>Prognostic Factor</th>
<th>Criteria</th>
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<tbody>
<tr>
<td>ISS stage</td>
<td></td>
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<tr>
<td>I</td>
<td>Serum $\beta_2$-microglobulin &lt; 3.5 mg/L, serum albumin $\geq$ 3.5 g/dL</td>
</tr>
<tr>
<td>II</td>
<td>Not ISS stage I or III</td>
</tr>
<tr>
<td>III</td>
<td>Serum $\beta_2$-microglobulin $\geq$ 5.5 mg/L</td>
</tr>
<tr>
<td>CA by iFISH</td>
<td></td>
</tr>
<tr>
<td>High risk</td>
<td>Presence of del(17p) and/or translocation t(4;14) and/or translocation t(14;16)</td>
</tr>
<tr>
<td>Standard risk</td>
<td>No high-risk CA</td>
</tr>
<tr>
<td>LDH</td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>Serum LDH $&lt;$ the upper limit of normal</td>
</tr>
<tr>
<td>High</td>
<td>Serum LDH $&gt;$ the upper limit of normal</td>
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<tr>
<th>5-Year survival</th>
<th>Median survival</th>
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<tbody>
<tr>
<td>R-ISS I</td>
<td>82%</td>
</tr>
<tr>
<td>R-ISS II</td>
<td>62%</td>
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<tr>
<td>R-ISS III</td>
<td>40%</td>
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</tbody>
</table>

Median OS:
- R-ISS I: NR
- R-ISS II: 83 months
- R-ISS III: 43 months
High-Risk Multiple Myeloma: Definition

Combination of International Scoring System 3, High Lactate Dehydrogenase, and t(4;14) and/or del(17p) Identifies Patients With Multiple Myeloma (MM) Treated With Front-Line Autologous Stem-Cell Transplantation at High Risk of Early MM Progression–Related Death

Philippe Moreau, Michele Cavo, Pieter Sonneveld, Laura Rosinol, Michel Attal, Annalisa Pezzi,
Froedtert & Medical College of Wisconsin Experience (n=77)

% Surviving

Years after transplant

Right Treatment for the Right Patient at the Right Time

**Early relapse**: <24 months after primary therapy or <18 months after autologous transplant.

Tandem autologous – allogeneic transplant in high-risk myeloma patients.

Discourage allogeneic transplant in patients with multiple relapses and truly refractory myeloma.
Allogeneic Transplants best done on a clinical trial: BMT Clinical Trial Network study 1302

Ages 18-65; Upfront High Risk MM, or Early Failures; 8/8 match donor

Allogeneic Transplant using matched sibling or unrelated donor

Randomize

Maintenance

Placebo

60-120 days

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Armand Quick-William Stapp
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Froedtert & MCW Preference

We offer allogeneic transplant to multiple myeloma patients to

Those with early relapse (<24 months) after primary therapy that included autologous transplant

OR

Those who have high-risk MM (high-risk cytogenetics, plasma cell leukemia)

AND

Those who remain sensitive to therapy, and are able to achieve remission prior to transplant
Thank You

Questions?

Acknowledgment:
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