2-2012

Effect of Body Composition and Renal Function on the Pharmacokinetics of High-Dose Melphalan for Multiple Myeloma

Dan T. Vogl  
*University of Pennsylvania*, dan.vogl@uphs.upenn.edu

Rosemarie Mick  
*University of Pennsylvania*, rmick@mail.med.upenn.edu

Eric T. Stoopler  
*University of Pennsylvania*, ets@dental.upenn.edu

Lisa E. Davis

Thomas M. Paul  
*University of Pennsylvania*

*See next page for additional authors*

Follow this and additional works at: [http://repository.upenn.edu/dental_papers](http://repository.upenn.edu/dental_papers)

Part of the Biological Factors Commons, Other Pharmacy and Pharmaceutical Sciences Commons, Pharmaceutical Preparations Commons, and the Surgical Procedures, Operative Commons

Recommended Citation


Abstracts from the 2012 BMT Tandem Meetings. Poster presentation in San Diego, CA.

This paper is posted at ScholarlyCommons. [http://repository.upenn.edu/dental_papers/34](http://repository.upenn.edu/dental_papers/34)  
For more information, please contact libraryrepository@pobox.upenn.edu.
Effect of Body Composition and Renal Function on the Pharmacokinetics of High-Dose Melphalan for Multiple Myeloma

Disciplines
Biological Factors | Other Pharmacy and Pharmaceutical Sciences | Pharmaceutical Preparations | Surgical Procedures, Operative

Comments
Abstracts from the 2012 BMT Tandem Meetings. Poster presentation in San Diego, CA.

Author(s)
Dan T. Vogl, Rosemarie Mick, Eric T. Stoopler, Lisa E. Davis, Thomas M. Paul, German Salazar, Maria Raguza-Lopez, David L. Porter, Selina M. Luger, and Edward A. Stadtmauer

This other is available at ScholarlyCommons: http://repository.upenn.edu/dental_papers/34
Strongest correlation with ClMEL was for CrClCG, and multivariable such as hemoglobin, albumin, immunoglobulins, or M-spike. The body fat weight, or body lean percentage, or with other measurements, the Sciences, Philadelphia;5 University of Puerto Rico, San Juan

Introduction:

Plerixafor is a novel agent that enhances the mobilization of peripheral blood stem cells (PBSCs) in lymphoma and multiple myeloma (MM) patients whose cells mobilize poorly. Due to the substantial cost associated with its use, a cost utility analysis was performed to evaluate the economics of salvage Plerixafor in MM patients who failed previous mobilization.

Methods: A decision model was developed to analyze the cost utility for two salvage regimens: Plerixafor + GCSF (PG) versus Cyclophosphamide + GCSF (CG). The model assumes that patients undergo mobilization with one of the regimens, followed by apheresis and subsequent autologous transplant if CD34+ cell count is ≥ 2 x 10^6 cells/kg, or Bortezomib plus Dexamethasone if insufficient CD34+ cells are collected. Patients included in the model will eventually progress and die from their disease. A structured literature review was performed to collect data on the successful mobilization rate, life year gained and quality of life associated with the modeled options. The analysis was from the perspective of Jordanian Ministry of Health; the costs were based on its list prices and included the costs of medications, apheresis, autologous transplant and adverse effects management. The willingness to pay threshold was $30,000 per quality adjusted life year (QALY). Incremental cost effectiveness ratio (ICER) was calculated by dividing the incremental average cost by the incremental QALY gained. One-way sensitivity analysis was performed to explore the impact of the uncertainty in efficacy data on the results.

Results: The model showed that PG was associated with higher probability of achieving successful re-mobilization and subsequent transplant. The average total costs associated with CG and PG were $41,500 and $58,400 respectively. The estimated ICER was $52,813/QALY. (Table 1) The sensitivity analysis revealed that the ICERs ranged from $86,500 to $40,488 per QALY gained when the probability of PG success ranged from 60% to 95%.

Conclusion: This analysis showed that the use of Plerixafor plus GCSF as salvage mobilization regimen in MM patients was not cost effective compared to Cyclophosphamide plus GCSF from the perspective of our health care system. To our knowledge, this is the first study to describe a cost utility analysis of Plerixafor use in this indication.

Table 1. Analysis of Plerixafor plus GCSF (PG) versus Cyclophosphamide plus GCSF (CG)

<table>
<thead>
<tr>
<th>Regimen</th>
<th>PG</th>
<th>CG</th>
<th>Incremental results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Probability of successful mobilization</td>
<td>0.80</td>
<td>0.27</td>
<td>0.53</td>
</tr>
<tr>
<td>Average total costs ($1000)</td>
<td>$58,400</td>
<td>$41,500</td>
<td>$16,900</td>
</tr>
<tr>
<td>Life year gained</td>
<td>4.3</td>
<td>3.8</td>
<td>0.50</td>
</tr>
<tr>
<td>QALY</td>
<td>2.58</td>
<td>2.26</td>
<td>0.32</td>
</tr>
<tr>
<td>ICER ($/QALY gained) for PG</td>
<td>$52,813</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Conclusion: A composite calculation incorporating age, weight, and serum creatinine, like CrClCG, may be the best way to choose melphalan doses but only explains 26% of drug exposure variability. Other measures of body composition were poor predictors of exposure. Further research is needed to better address the remaining variability in drug clearance and exposure.

Comparative Cost Utility Analysis of Plerixafor Plus GCSF Versus Cyclophosphamide Plus GCSF as Salvage Mobilization Regimens in Multiple Myeloma Patients

Background: More than 95% of patients with multiple myeloma have a detectable monoclonal protein either in the serum or urine. Less than 5% of patients have non-secretory myeloma (NSM), characterized by the absence of a monoclonal protein. There are limited available data on the outcome of patients with NSM (Ref. Kumar S et al.). We studied the outcomes of patients with NSM after high-dose chemotherapy and autologous hematopoietic stem cell transplantation (auto-HCT), and compared them to a matched group of patients with secretory myeloma (SM).

Methods: Between 1988 and December 2010, 1567 patients with MM received auto-HCT at our institution. We identified 31 patients with NSM and compared their outcome to a matched group of 94 patients with SM. Patients were matched for age at auto-HCT, Durie-Salmon stage, response to therapy prior to auto-HCT, and the year of auto-HCT. Variables for the two groups were compared using the conditional logistic regression method to adjust the