Peripheral hematopoietic progenitor cell mobilization for autologous transplantation in hematologic malignancies

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In this issue of the *Revista Brasileira de Hematologia e Hemoterapia*, Gabús et al.[1] are publishing an interesting article about hematopoietic progenitor cell mobilization for autologous transplantation in hematologic malignancies. Although the analysis was retrospective, they utilized the abundant statistical tools and compared two successive groups of patients with similar numbers and over similar periods, in order to compare patients in respect to the origin of the growth factor used, different brands in the first group and a specific growth factor (JP Filgen - Clausen filgrastim) in the second.

First, it is worth noting some features of the profile of the service in which the mobilization was analyzed that performs a large number of autologous compared to allogeneic transplants (80% and 20% respectively) and a slight predominance of patients from the Uruguayan National Health System. The target collection of $CD34^+$ cells was consistent with the literature.

Some results should be mentioned and discussed:

1. The mobilizations were very effective with collections of the desired numbers of $CD34^+$ cells using few leukapheresis procedures from most patients;
2. The 10% mobilization failure rate corroborates medical literature, both for the overall proportion, in respect to age and autologous transplantation and active disease. However, many patients with multiple myeloma had bad mobilizations even though characteristically these patients mobilize well, better than those with Hodgkin's lymphoma, for example. One possible explanation for this may be related to the chemotherapy used, melphalan, which used to be considered a single line chemotherapy before, but with significant negative impact on mobilization, much more than a number of other chemotherapy lines;
3. The strategy to try to collect from "bad mobilizers" in this series was very effective whether by repeating the mobilization (majority) or collecting cells directly from bone marrow;
4. Another important feature to be commented on is the relative small proportion of patients mobilized with filgrastim associated with chemotherapy (14.6%) as most were mobilized with growth factor alone (85.4%). As the paper states, the use of chemotherapy in combination with filgrastim is reserved for patients when difficulty in obtaining $CD34^+$ cells is expected or when there is any additional benefit from chemotherapy, such as to better control the underlying disease. We believe that *in vivo* "purging" before mobilization will help patients to enter the autologous transplantation procedure closer to remission, even considering the higher cost (more growth factors, hospital, antibiotics, transfusions, etc) and the greater difficultly to obtain $CD34^+$ cells. But this is still an open question in the medical literature;
5. A very important point to discuss is that Group B, i.e., those mobilized with Filgen JP (Clausen filgrastim) used a significantly lower amount of filgrastim but the quality of mobilization was similar, which may be more efficient in relation to the filgrastim used previously (Group A).

Our group has been studying for several years, strategies to optimize the collection of hematopoietic progenitor cells from peripheral blood by apheresis, considering various parameters. Our first work was published in 2000,[2] when we had observed that shorter periods between chemotherapy, mobilization and recovery of total leukocytes, improve the collection in terms of fewer leukaphereses needed to obtain $CD34^+$ cells. The parameter to begin apheresis was recovery after the nadir leukocyte count reached 1000 cells/mm^3. Following that, in a study published in 2006,[3] we analyzed other parameters to predict the ideal time to start apheresis, in order to reduce the number of procedures. At that time, we began to use the same guideline that Gabús et al,[1] i.e., when the $CD34^+$ count in peripheral blood reached 10 cells/mm^3. We were able to demonstrate, through sequential daily blood cell and $CD34^+$ counts, that the best day can be predicted by a formula that considers hemoglobin on the day of mobilization chemotherapy and the number of days between chemotherapy mobilization and when the $CD34^+$ cell count in peripheral blood reached

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10 cells/mm^3. Thus, we discovered that we were collecting too early.

Using this formula prospectively, we analyzed in terms of "cohort", this new strategy of mobilization[4] and observed that this formula was useful in patients with lymphoma, but not with multiple myeloma.

As we can see with these considerations above, this is an important issue that deserves to be further studied and published, thus supporting the initiative that Gabús et al.[1] had in publishing this article.

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