

2005 Tandem BMT Meetings

HPC in peripheral blood predicts CFU Activity and time to Engraftment in Autologous Apheresis PBSC products as effectively as CD34 cell count.

In autologous PBSC products collected following growth-factor mobilization, previous studies have shown that measurements of HPC correlate with CD34 cell count in peripheral blood (PB) before apheresis collection. Since CFU activity in the final product is expected to be a standard measure of HSC/HPC content we compared the HPC and CD34 counts in PB before collection with CFU in the final product, to determine the utility of pre-apheresis HPC to identify patients likely to produce a suitable product. By measuring CD34 and total MNC cell content in PB before collection, midway through collection and in the final product, we found that the ratio of CD34/MNC remained constant. This demonstrates that recovery of progenitor cells and MNC is identical throughout collection and processing. This observation allows calculation of expected CFU content in the final product based on pre-apheresis HPC and CD34 measurements. Using the observed product ratio of CFU/CD34 (.192 +/- .102) and the expected product ratio of CFU/HPC (.113) +/- .060 (n=25 for both values) we compared the predicted product CFU content based on observed HPC and CD34 cell count in pre-apheresis peripheral blood with the actual CFU content recovered in the final product.

RESULTS: Twelve measurements of 10 autologous products were compared between CFU (10^6) predicted by peripheral blood HPC (median=21, range:0-416) and CD34 (median=11, range:0-165) with actual CFU (median=23, range:4-131) obtained on the final product ($p=.08$, Freidman test). A strong linear association exists between actual CFU and pre-apheresis HPC (Spearman rank correlation =.84).

CONCLUSION: This pilot study suggests that HPC in peripheral blood predicts CFU content as effectively as CD34. For 75% of the samples, the observed CFU predicted by HPC was higher than the CFU predicted by CD34 possibly indicating a CD34 – fraction capable of colony formation and which could be measured by the HPC parameter.