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HPC enumeration with the Sysmex XE-2100 can guide further flow cytometric CD34(+) measurements and timing of leukaphereses

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BACKGROUND: The aim of this study was to evaluate whether HPC counts measured with the hematology analyzer can predict CD34+ levels in peripheral blood and in the apheresis product, as detected by standard flow cytometry. The main focus was the evaluation of HPC counts in poor mobilizers. METHODS: Progenitor cell quantification was performed measuring HPC counts provided by the Sysmex XE-2100 hematology analyzer and CD34+ counts obtained in parallel by flow cytometry. Peripheral blood of patients who had received chemotherapy and G-CSF (142 measurements) and healthy donors mobilized with G-CSF alone (106 measurements) was investigated HPC counts in peripheral blood were also correlated with apheresis yield. RESULTS: HPC counts were significantly higher than CD34+ counts (3.5 fold inpatients and 1.7 fold in healthy donors, p= 0.0015). Our data indicate that HPC counts < or = 10/microL in pretreated patients predict a low probability of adequate CD34+ counts in peripheral blood and yields < 2 x 10(6)/kg in subsequent aphereses. Furthermore, repetitive low HPC enumerations in an individual were followed by insufficientCD34+ counts in peripheral blood or aphereses in 81% of investigations. In healthy donors low HPC counts (< or = 10/microL; 12/106 measurements) did not exclusively predict low CD34+ counts (median 23/microL). DISCUSSION: HPC counts can be used to schedule the start of CD34+ measurements(threshold > 10 HPC/microL) in patients mobilized after chemotherapy for autologous donation. Thus, expensive and time-consuming CD34+ enumerations can perhaps be minimized HPC measurements cannot completely replace flow cytometric CD34+ enumeration. In particular healthy stem-cell donors should be monitored with both methods to exclude false negative HPC measurements.

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