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Effectiveness of hematopoietic progenitor cell separation with the help of the Sepax S100 cell separator

Alexander B. Smolyaninov, Dmitry A. Ivolgin, Sherzod F. Adylov, Elena A. Kotelevskaya

Stem Cells Bank Pokrovski, Bolshoi Prospekt V.O., Saint Petersburg, Russia

Correspondence: Alexander B. Smolyaninov, Stem Cells Bank Pokrovski, Bolshoi Prospekt V.O., 85, 199106, Saint Petersburg, Russia, Phone: +7 (812) 908-7727, E-mail: stemcellbank@inbox.ru

Abstract

Cord blood processing for hematopoietic progenitor cell (HPC) separation had a quantum jump through the last few years. Only 5 years ago the cord blood bank in Singapore, which separated buffy coat practically by hand, had been accredited by the AABB. But now there is equipment that simplifies this step of cord blood processing. Confirmation of the effectiveness of the method of HPC separation using the Sepax S100 cell separator is our study purpose.

Using the established Stem Cells Bank Pokrovski procedure, we added the HES solution to the cord blood harvest and then placed it into the Sepax S100. We tested the leukoconcentrate after processing and before cryopreservation.

We processed 135 samples of cord blood using this technique. The average volume of processed cord blood was 89.45±23.52 ml. The average volume of leukocytal fraction was 21.35±5.35 ml (we used different protocols according to the cord blood harvest volume). The total amount of leucocytes in the concentrate was equal to 34.6±4.87*10^6cell/ml and the CD34+ cell fraction was 0.072±0.014 cell/ml – 0.2% of mononuclear cells on average. The vitality of HPC amounted to 91.2±8.4% on average. The tests had been carried out using a Beckman Coulter flow cytometer. We also found bacterial contamination in 4 samples (2.9%).

Our conclusion is that the effectiveness of cord blood processing using the Sepax S100 is equal to and—in some cases—better than other popular methods of cell separation. The comfort, processability, and accordance with international standards of that technique can significantly simplify cord blood processing. The Sepax S100 is capable of making this processing more available for our developing branch of stem cell banking and cell therapy.

Keywords: cord blood, hematopoietic progenitor cells, cell separation