

Predicting Overall Viability of Cord Blood Harvests

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Aim:

Cord blood (CB) is a product rich in primitive adult stem cells used in haematopoietic stem cell transplantation. After collection, the CB is generally transported to a facility where the unit is processed and then frozen up to 48hrs after collection. These processes can lead to compromised overall white cell (WC) viability of the CB product. This study investigates the factors that affect overall WC viability before freezing of the cells cryogenically.

Method:

Results from 9918 CB collections were studied. The relationship between collection volume and elapsed time to freezing, on the overall viability of CB product was analysed.

Results:

The collected CB units had a mean volume of 77.1 ± 31.3 ml, a mean WC count of $10.5 \pm 5.6 \times 10^8$, a mean total CD34+ cell count of $4.0 \pm 3.7 \times 10^6$ and a mean overall WC viability of $91.7 \pm 6.5\%$. Overall WC viability was most significantly affected by the volume of CB collected and the time to freezing. As collection volumes increased, overall viability increased, with average viability of $95.0 \pm 3.5\%$ in CB collections of >120 ml. Decreased viability was associated with smaller volumes of <60 ml and increased time to freezing of >24 hrs. From this data we have developed decision tables that estimate overall WC viability based on CB volume and time to freezing.

Conclusion:

This study identifies optimal time to freezing for different collection volumes in order to maintain optimal overall WC viability of the collected CB.

No conflict of interest to disclose