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Cord Blood Bank Management, Administration, and Sustainability

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Abstract 30

Should Cord Blood Unit Distribution Patterns Impact Collection Strategies?

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Introduction: The National Cord Blood Program has a large inventory of clinical cord blood units (CBUs) available for transplant (more than 60,000). As a small proportion is distributed each year, new collections should theoretically replenish the inventory, but it is unclear which characteristics should be prioritized for banking.

Objective: Our goal was to characterize distributed CBUs (in terms of cellularity, race/ethnicity, and match), compare them with the inventory, and devise a collection strategy.

Methods: Shipments from January 2015 to March 2022 were reviewed (n = 1,046). Race/ethnicity information on CBUs was obtained at the time of collection and was available for 55,934 stored CBUs and 1,020 distributed CBUs. It was also obtained for 394 recipients. HLA match was determined as HLA-A and B antigens and DRB1 allele match (/6), and allelic match as HLA-A, B, C, DRB1 allele match (/8). Total nucleated cells (TNC) and CD34 cells were counted at banking of the CBU, and cell doses (per kg of recipient's weight) were calculated at shipment.

Results: The proportion of White Non-Hispanic (WNH) CBUs distributed (38%) was lower than what is present in the inventory (46%), but match levels were higher among these units (Figure 1A and 1B), with 55% of WNH CBUs being 5/8 or higher, vs 40% for minorities' CBUs. Race match between CBU and recipient led to higher matched transplants, but 41% of race mismatched CBUs still reached 6/8 or higher allele match. The median TNC was 102×10^7 for stored CBUs and 167×10^7 for distributed CBUs (Figure 1C). Better matched units have been selected with lower cell contents (Figure 1D).

Discussion: CBUs broaden transplant options across ethnic groups, and much focus has been placed on collecting minorities' CBUs. However, our analysis showed that WNH CBUs are still the largest distributed population, with higher allele match to the recipient (predicting better transplant outcomes), so these CBUs should not be excluded from collection strategies. From the data presented here, the goal for new collections should be to obtain CBUs with higher TNC and CD34 (spreading across all races and ethnicities). These would replenish the pool of high cellularity CBUs that are more often selected for transplant.

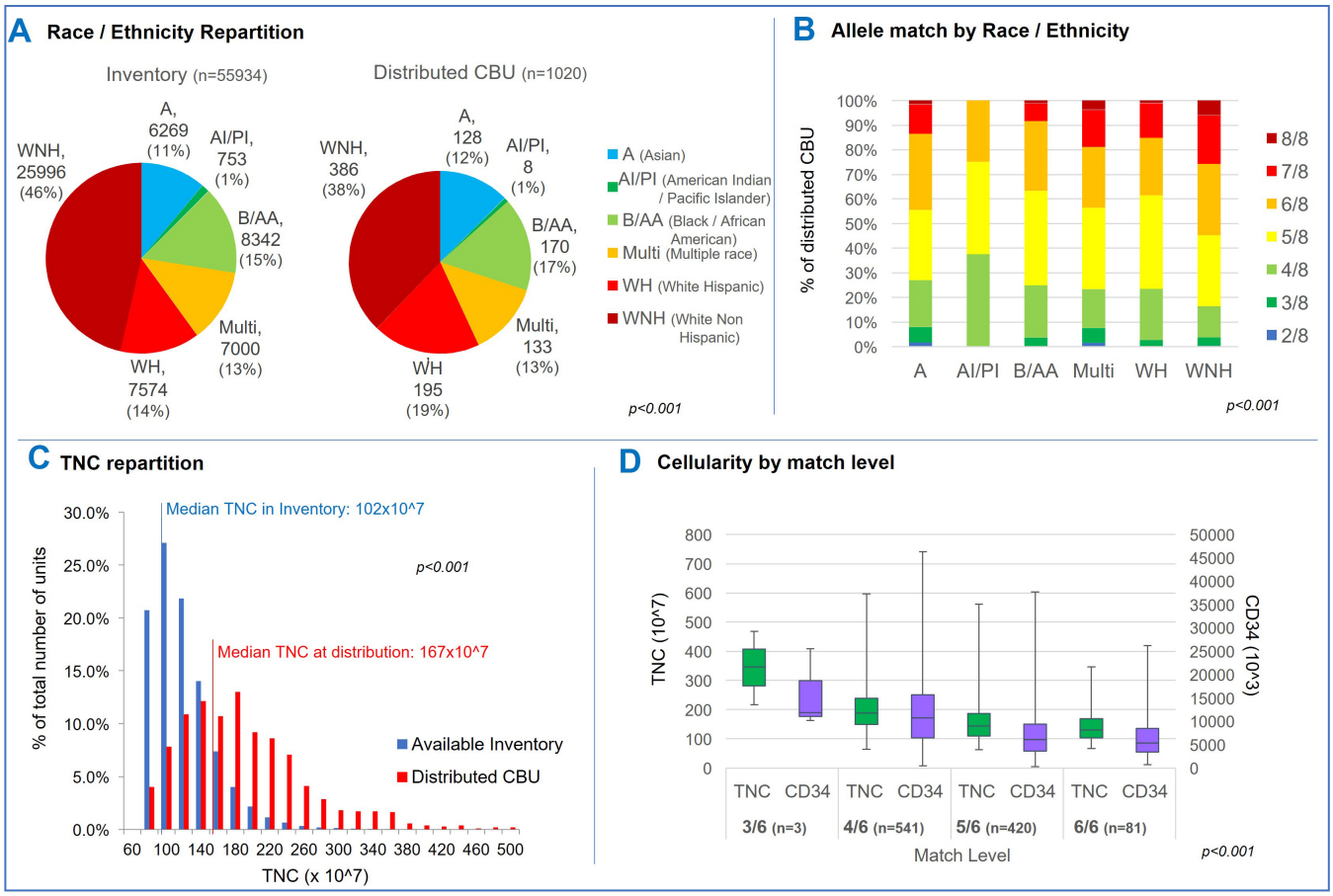

Figure 1. Distribution characteristics.