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INTRODUCTION-BACKGROUND: Cord blood (CB) contains hematopoietic progenitor cells, including nucleated red blood cells (NRBCs) (figure 1), in small percentages. NRBCs express the CD71 marker on their surface.

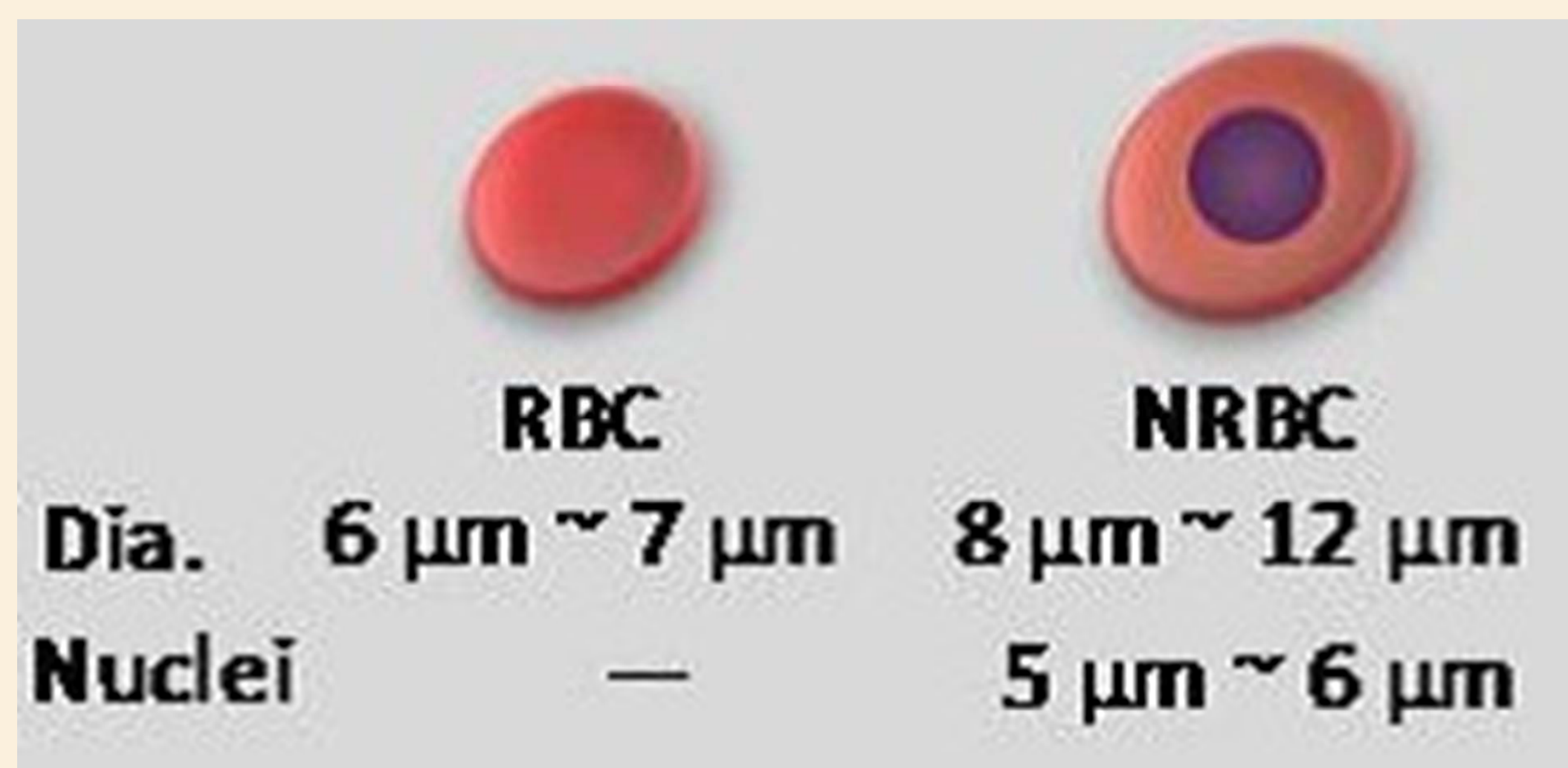


Figure 1: Comparison between red blood cell (RBC) and NRBC. NRBC, which has not lost its nucleus, is a much bigger cell (Kumo et al. 2010).

OBJECTIVE: NRBC enumeration in unprocessed and volume-reduced cord blood units (CBU) samples, as well as the study of the potential correlation of NRBCs with several factors.

MATERIALS AND METHODS: A total of 53 CBUs were manually volume-reduced by Rubinstein's double centrifugation method. In addition, samples were removed and cell enumeration as well as viability determination were carried out using flow cytometry.

RESULTS-DISCUSSION: The number of NRBCs in unprocessed samples ($141,8 \pm 73,5 \times 10^6$ cells) was higher than in volume-reduced ($69,1 \pm 44,6 \times 10^6$ cells) ($p < 0,001$) (Chart 1). Moreover, viability rates were slightly higher in volume-reduced samples ($93,9\% \pm 3,1$) than in unprocessed ($92,0\% \pm 5,1$). Recovery was calculated as $76,3\% \pm 11,2$. Furthermore, there was a positive correlation between NRBCs and gestational weeks ($p < 0,01$) (Chart 2). The mean value of NRBCs in CBUs collected after 39-41 gestational weeks ($n=31$) was higher than in those collected after 37-38 gestational weeks ($n=22$) ($170,7 \pm 75,1 \times 10^6$ cells vs. $101,0 \pm 48,4 \times 10^6$ cells before volume reduction and $80,0 \pm 46,4 \times 10^6$ cells vs. $53,6 \pm 37,8 \times 10^6$ cells after volume reduction). No statistically significant correlation was found between NRBCs and type of delivery, infant's sex and weight ($p > 0,05$).

CONCLUSION: Processing-related losses are expected. Gestational weeks seem to influence NRBC count in CBU samples. Nevertheless, repetition of the study is recommended, using more CBUs and considering more factors which are supposed to increase the NRBC count, such as medication and smoking during pregnancy.

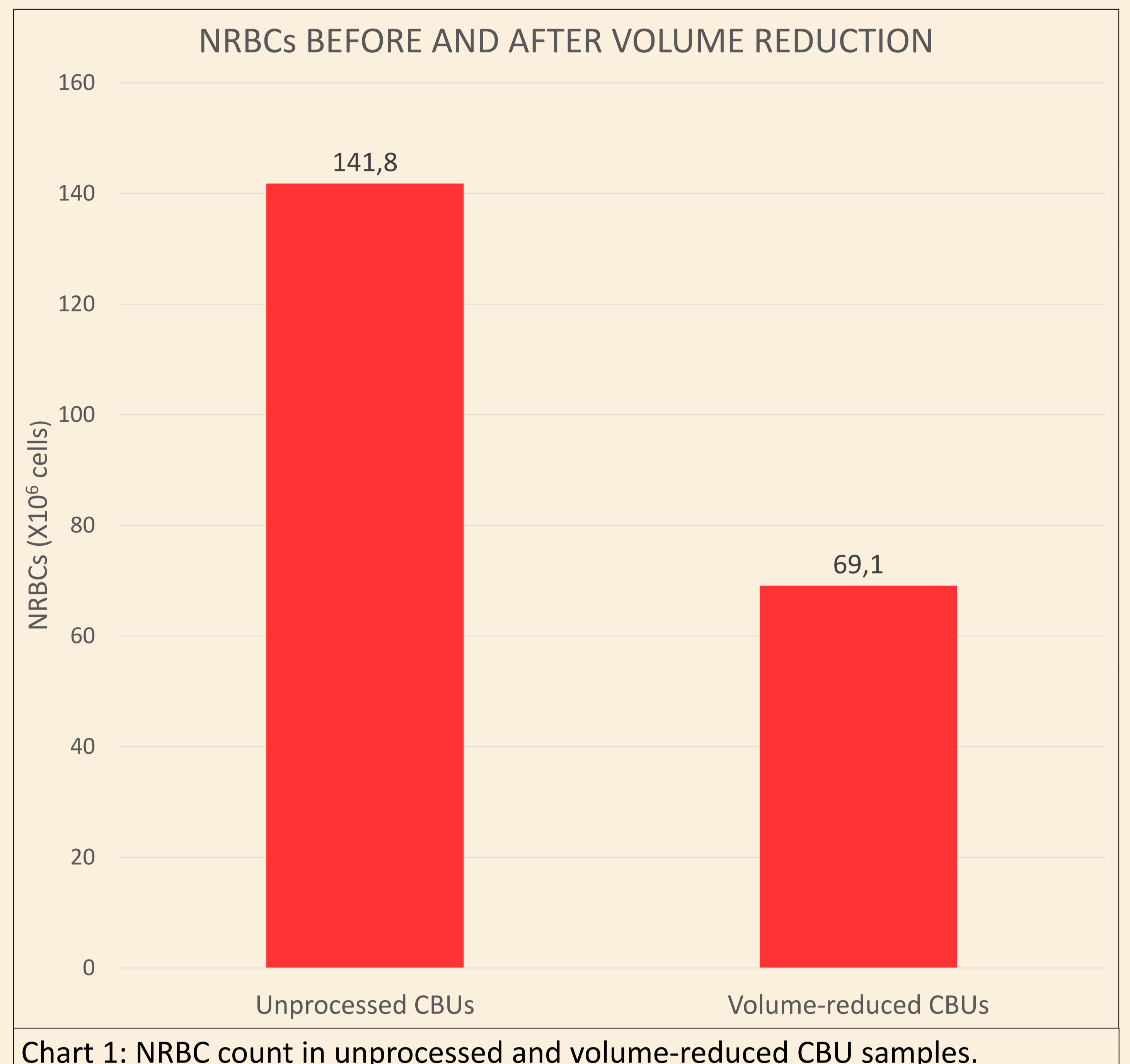


Chart 1: NRBC count in unprocessed and volume-reduced CBU samples.

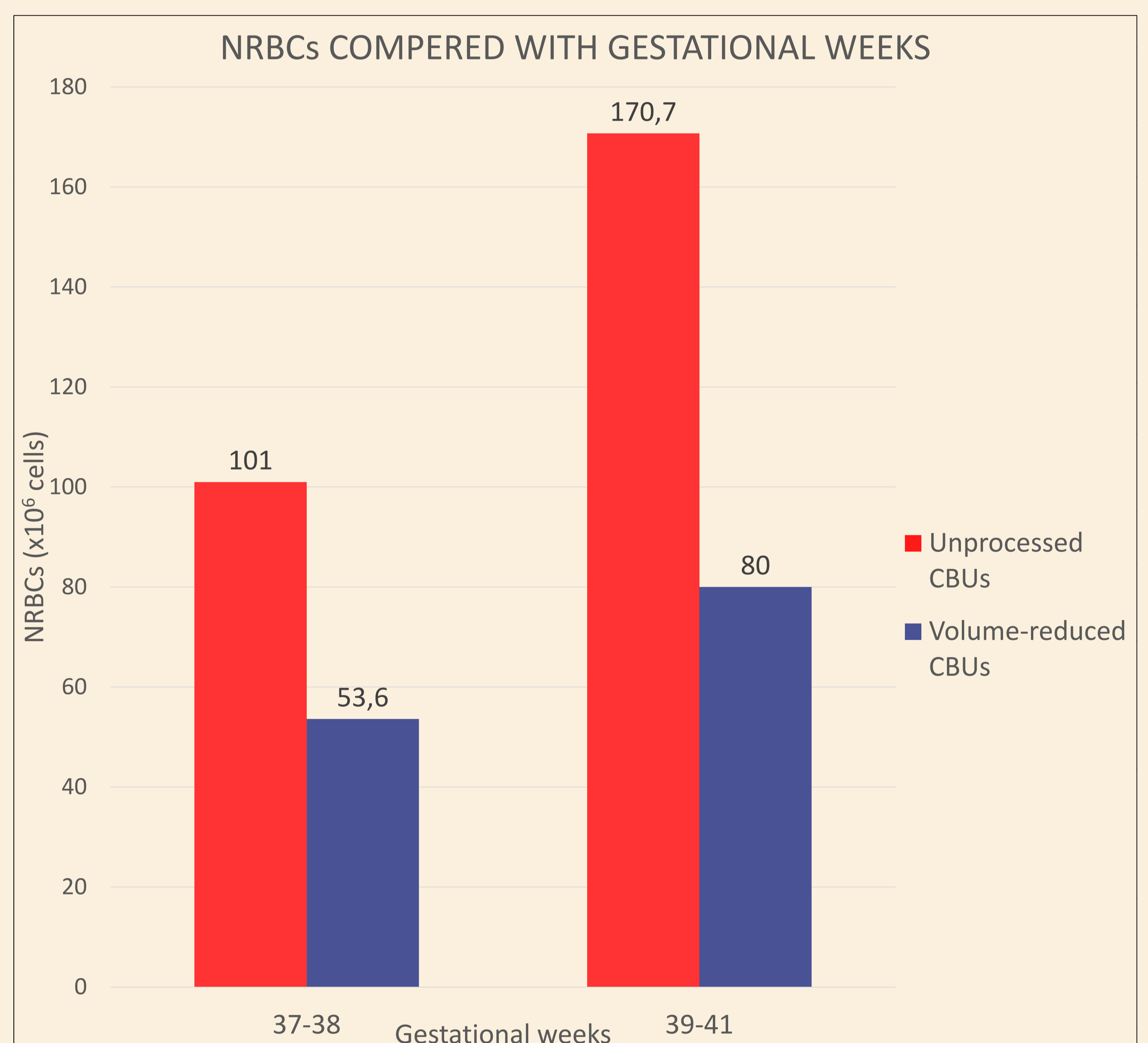


Chart 2: NRBC count, before and after volume reduction, compared with both 37-38 and 39-41 gestational weeks.

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