

Effects of gestational diabetes mellitus on the quality and quantity of blood hematopoietic stem cells: a case-control study

ABSTRACT

Aim: To evaluate the effects of gestational diabetes mellitus (GDM) on the quantity and quality of hematopoietic stem cells (HSC). **Methods:** In this case-control study, HSC were isolated from umbilical cord blood (UCB) procured at delivery from 63 mothers with GDM and 67 healthy mothers. Total nucleated cells (TNC) and CD34+ cells were quantified using BD FACSCalibur flow cytometer. The quantity and quality of stem cells were determined. **Results:** The GDM group had lower total cord blood volume and lower number of nucleated HSC compared with healthy mothers. Regarding stem cell quantity parameters, they had significantly lower UCB volume ($P=0.041$), TNC count ($P=0.022$), total viable NC count ($P=0.014$), and CD34+ percentage ($P=0.014$). Regarding the quality of stem cells, they had significantly lower viable TNC percentage ($P=0.015$). The predictors for total TNC count were longer labor duration (adjusted B coefficient [p]: 0.031 [0.046]), greater estimated blood loss (0.089 [0.005]), female neonates (12.322 [0.049]), and higher placenta weight (0.080 [0.033]). The predictors of total viable NC count were greater estimated blood loss (0.092 [0.003]), female neonates (13.16 [0.035]), and greater placenta weight (0.083 [0.026]). **Conclusion:** The GDM group had much lower quantity and quality of UCB stem cells. Our results should be taken into consideration when drawing cord blood for unrelated stem cell banking in an obstetric unit to ensure the obtaining of optimal cord blood samples and to avoid unnecessary expenses.