

## Human Umbilical Cord Blood Cell Administration's Reduction of Atherosclerotic Plaques in the *Ldlr<sup>tm1Her</sup>* Mouse Without Immunosuppression

(Poster No. 26)

Norman Ende, MD<sup>1</sup> (endeno@umdnj.edu); Milton Ende, MD<sup>2</sup>; R. Chen, MD<sup>1</sup>; K. Coakley, BA<sup>1</sup>; A. Reddi, MD.<sup>3</sup> <sup>1</sup>Department of Pathology and Laboratory Medicine, UMDNJ, Newark, NJ; <sup>2</sup>Department of Medicine, Southside Regional Medical Center, Petersburg, Va; <sup>3</sup>Department of Medicine, UMDNJ, Newark, NJ.

**Context:** Congenic bone marrow transplantation can alleviate plaque formation in the apolipoprotein E-deficient mouse. Similar to bone marrow transplantation, human umbilical cord blood (HUCB) cell administration and human breastmilk (hBM) have been shown to have therapeutic effects on other murine disease models. This study examined the extent of atherosclerosis following HUCB cell and hBM administration in male homozygous mice that develop atherosclerosis through the targeted mutation 1 in the low-density lipoprotein receptor (*Ldlr<sup>tm1Her</sup>*).

**Design:** Four groups of mice were studied. One group (N = 8) received  $200 \times 10^6$  HUCB cells retro-orbitally. Another group (N = 6) received hBM. The third group (N = 6) received HUCB cells and hBM, and the fourth group (N = 10) received no treatment. Treatment was started at 7 weeks, and mice were killed at 30 months of age. The extent of atherosclerosis in the ascending aorta, above the aortic valve, and the thoracic-abdominal aorta was evaluated by a grading system from 1+ to 4+; 1+ being the least and 4+ the most significant lesion involving the entire circumference of the vessel.

**Results:** In the ascending aorta, HUCB cell treatment significantly ameliorated atherosclerosis treated vs. untreated (mean  $\pm$  SEM:  $2.75 \pm 0.37$  vs.  $3.93 \pm 0.07$ ;  $P < .02$ ). Combined treatment significantly improved atherosclerosis of the ascending aorta; however, hBM alone was suggestive of improvement but showed no statistical difference from untreated mice. There was no treatment effect on atherosclerosis in the thoracic-abdominal aorta.

**Conclusions:** HUCB cell treatment has the potential to reduce plaque formation in the *Ldlr<sup>tm1Her</sup>* mouse.