

FRESH FROZEN PLASMA MAY DECREASE LEVELS OF ENDOTHELIAL DYSFUNCTION IN BURN INJURY PATIENTS

ANNA MERMILLIOD, CARA RAMOS, DHANUSHKA VITHARANA, ABDUL-RAZAK MASOUD, ADA OZCAN, KAITLYN ANDRE, CLAUDIA LEONARDI, M. VICTORIA P. MILES, JEFFERY CARTER, JONATHAN SCHOEN, HERBERT PHELAN, ALISON SMITH

Background: Patients with major burn injuries are resuscitated with a combination of crystalloids and colloids. Fresh frozen plasma (FFP) can also be given to patients with high total body surface area (TBSA) burns as an adjunctive colloid solution during burn resuscitation. FFP may reduce the endothelial dysfunction associated with large TBSA burns. Further, FFP may play a role in changing the patient's inflammatory state by affecting cytokine levels released by adipose-derived stem cells (ADSCs), specifically the cytokine, VEGF-A. This research study aimed to investigate the role of FFP on VEGF-A levels in burn patients.

Methods: Following IRB approval, adipose tissue was collected from adult patients with full thickness burn injury during their initial surgery. ADSCs were isolated from the tissue by trypsin enzyme digestion. Fluorescence activated single cell sorting (FACS) of ADSCs was performed to determine purity with CD105, CD90, and CD73 antibodies. ADSCs were grown under standard tissue culture conditions and the supernatant was collected for cytokine analysis. Data were analyzed using a linear regression to plot total amount of FFP against VEGF-A levels along with a Spearman correlation.

Results: Fourteen patients receiving FFP during the first 36 hours post-burn injury were enrolled in this study. The amount of FFP given ranged from 258-3186 mL, with an average of 1465 ± 715 mL. Average TBSA for these patients was found to be $42 \pm 22\%$ and an average patient age of 53 ± 16 years. Both linear regression and Spearman correlation showed a moderately strong negative correlation between amount of FFP ($R = -0.5758$ and Spearman coefficient = -0.433).

Conclusions: VEGF-A has previously been shown to have a role in angiogenesis, which can increase inflammatory cell infiltration and lead to endothelial cell dysfunction. Patients who received higher FFP levels are correlated with lower levels of VEGF-A, indicating there may be a correlation between higher dosage of FFP and decreased endothelial cell dysfunction. Future studies are required to increase sample size to support this finding.