VON WILLBERAND FACTOR (VWF), FIBRONECTIN (FN) AND PHOSPHORYLATED NEUROFILAMENT HEAVY CHAIN-H (PNF-H) IN TRAUMAIC VASCULAR INJURY (TVI), MRI-POSITIVE AND MRI-NEGATIVE TRAUMATIC BRAIN INJURY (TBI).

BACKGROUND: vWf and Fn denote vascular injury. Increased pNF-H reflects diffuse axonal injury (DAI).

OBJECTIVES: 1) Assess relationship between vascular/axonal blood and neuroimaging markers. 2) Evaluate if additional blood biomarkers improve clinical outcome prediction after TBI.

DESIGN/METHODS: 76 patients with TVI (n=20), MRI-positive (n=26) and MRI-negative (n=30) TBI. Blood collected on Day0 and Day6. Glasgow Outcome Scale Extended (GOSE) done 30/90 days post-injury. TVI identified by microbleeds and/or linear hypointensities on susceptibility weighted imaging (SWI). DTI assessed fractional anisotropy (FA), mean (MD), axonal (AD), and radial diffusivity (RD), and pothole analysis in white matter.

RESULTS: Decrease of FA (F1.869, p<0.0001), increase of MD (F3.909, p<0.0291) and RD (F4.706, p<0.0153) between groups. Potholes increased in MRI-positive vs. TVI (p=0.049). Day0 and Day6 vWf increased (p=0.0159; p=0.01) in MRI-positive vs. MRI-negative. Day6 Fn increased (p=0.0296) in MRI-positive vs. MRI-negative. vWf and Fn correlated (Spearman r 0.3032, p<0.018) on Day0; neither correlated with pNF-H. Logistic regression of model (age, GCS, and Day0 biomarkers) showed only Day0 vWf was unique, with O.R. 1.053 (GOSE30) and 1.064 (GOSE90).

CONCLUSIONS: DTI revealed differences between imaging phenotypes of TBI in all groups. The axonal injury blood biomarker did not correlate to vascular injury biomarkers. vWf may be a useful prognostic biomarker for mTBI. These findings have implications for clinical trials of therapies targeted to TVI and axonal injuries.

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