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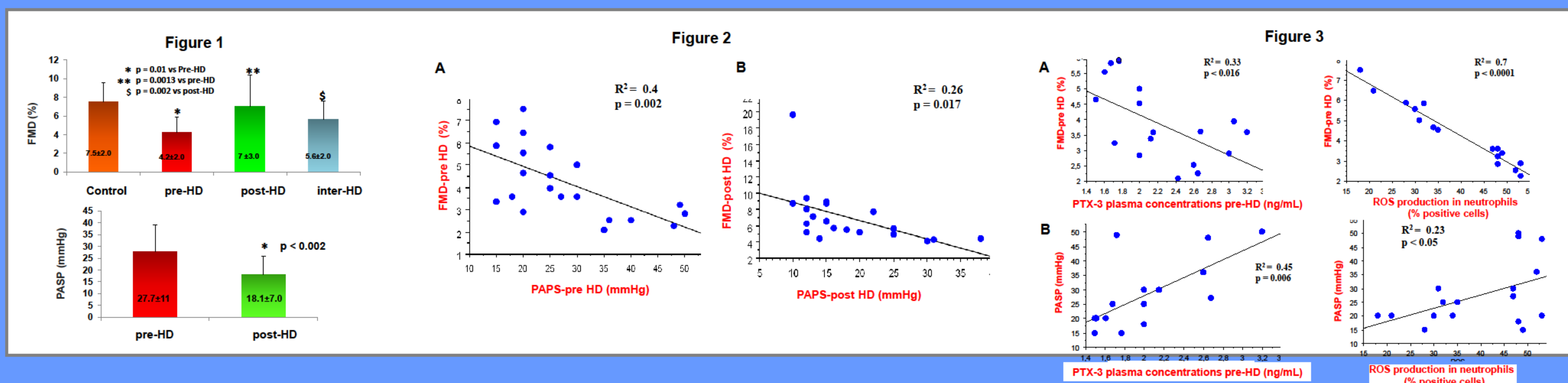
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Objectives:

Overhydration in HD patients is associated with increased cardiovascular morbidity and mortality. Long PTX3, a marker of inflammatory responses, may be involved in endothelial dysfunction and is a predictor of mortality in HD patients. The aim of the study was to evaluate in vivo the association between Overhydration, pulmonary artery systolic pressure (PASP), endothelial dysfunction (flow-mediated dilation, FMD), PTX3 and ROS production in HD patients.

Methods:

Sixty uremic patients (mean age 62.5 yrs; mean dialytic age 44.3 months) on stable HD treatment with synthetic membranes and 20 healthy subjects were enrolled. Neutrophils activation (CD62L⁺) and PTX3 protein expression were evaluated by flow cytometry and ELISA. Intracellular ROS generation in neutrophils was measured by 2',7'Diclorodihydrofluorescein. PASP and FMD of brachial artery were assessed non-invasively using echocardiography and high-resolution ultrasound. The arterial stiffness was evaluated using cardio-ankle vascular index (CAVI).



Results:

HD increased FMD from 4.23±1.8% (nv:7.5±2.1%; p<0.01) to 7.03±3.0%, (p<0.001). These changes returned to baseline by 24h (5.59±0.4%). Similarly, pre-HD PASP (27.7±11) decreased significantly after HD (18.1±7.0) (Figure 1). FMD values, observed pre and post-HD, were significantly (p=0.002) and inversely correlated with PASP values (pre-HD:27,7±11mmHg; post-HD 18.1±7.0 mmHg) (Figure 2). The change in FMD and PASP were associated with a significant increase (p=0.0001) in intracellular and circulating PTX3 expression, ROS generation (Figure 3) and neutrophil activation. Pre/post-HD (Δ) FMD was inversely correlated with CAVI (p<0.002) and P and PTH serum levels (p<0.02). In a multivariate analysis PTX3, P serum levels and PASP were independent predictors of altered FMD.

Conclusions:

Overhydration in HD patients may contribute to endothelial dysfunction and vascular stiffness by increasing PTX3 and ROS production.

References:

Kalantar-Zadeh K. et al. Fluid Retention Is Associated With Cardiovascular Mortality in Patients Undergoing Long- Term Hemodialysis. *Circulation*, 2009.
Zoccali C et al. Pulmonary Congestion Predicts Cardiac Events and Mortality in ESRD. *JASN* 2013.

