

PLASMA PRO-THROMBIN FRAGMENT 1.2 (PF 1.2) PREDICTS ACUTE KIDNEY INJURY IN ANAEMIC PATIENTS AFTER CARDIAC SURGERY

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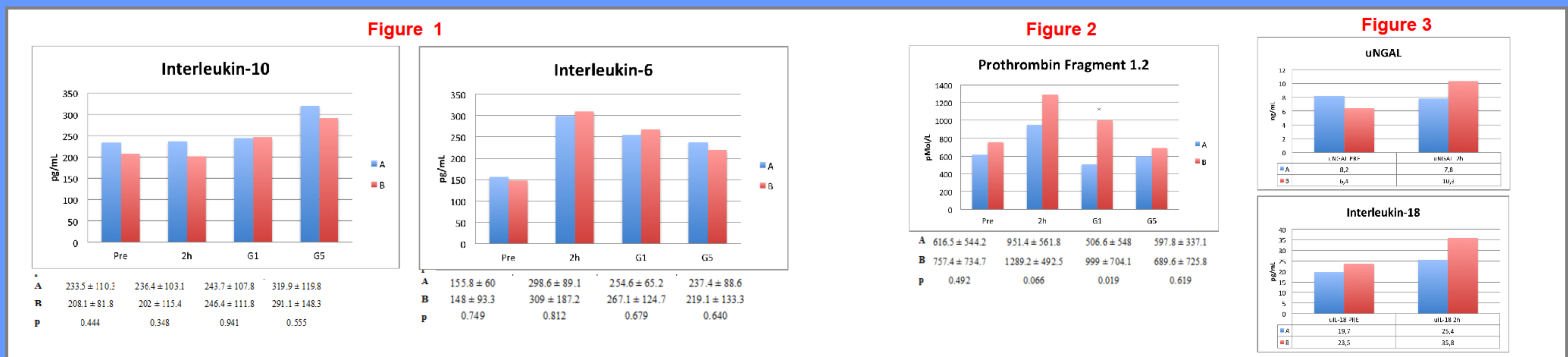
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Objectives:

Acute Kidney Injury (AKI) following cardiac surgery is a common complication associated to short and long-term mortality. The link between coagulation, fibrinolysis activation and inflammatory status during Cardio-pulmonary Bypass (CPB) are complex and not clearly explained. Coagulation activation has never been evaluated in this category of patients. Aim of the study was to evaluate the association between inflammatory and coagulation systems and post-operative acute kidney injury in patients at higher risk to develop AKI, specifically patients with higher EuroSCORE points and pre-operative anaemic status (pre-operative Hb <12 g/dL in women, <13 g/dL in men).

Methods:

Forty-one anaemic patients with EuroSCORE >6 were prospectively enrolled. Twenty-six patients with postoperative estimated Glomerular Filtration Rate (eGFR) reduction <25% were included in Group A and 15 patients with eGFR reduction >25% were included in Group B. Plasmatic Pro-thrombin Fragment 1.2 (PF 1.2, coagulation activation marker), Interleukin-6 (IL-6, pro-inflammatory marker), Interleukin-10 (IL-10, anti-inflammatory marker), urinary IL-18 (uIL-18) and Neutrophil Gelatinase-Associated Lipocalin (uNGAL) were evaluated.



Results:

An increase of inflammatory markers (IL-6, IL10) was observed in both groups immediately after the surgical operation compared to baseline, but no differences were found between groups (Figure 1). PF1.2 serum levels 24 hours after the operation were significantly higher in group B as compared to group A (506.6 ± 548 vs 999 ± 704.1 pmol/L; $p = 0.018$) and were independently associated with eGFR reduction in multivariate analysis (Figure 2). Twenty-four hours PF1.2 values had an Area under the Receiving Operating Characteristic (ROC) of 0.744 for eGFR reduction. uIL-18 had similar values in both groups 2 hours after the operation, but uNGAL increase (2 hours vs baseline) was significantly higher in Group B patients (0.3 vs 4.4 ng/mL; $p = 0.03$) (Figure 3). Specific urinary renal damage markers increased before a rise of serum creatinine occurred. Five patients of Group B required renal replacement therapy (average 38.4 hours after the operation).

Conclusions:

An elevated 24 hours-postoperative plasma PF1.2 level is an independent risk factor for AKI and dialysis in anaemic patients with a worsening renal function after cardiac surgery. Plasma levels PF1.2 rise could have a role in microcirculation impairment and renal tubular cell damage in these setting of patients.

References:

Scrascia G, et al. Anti-inflammatory strategies to reduce Acute Kidney Injury in cardiac surgery patients: a meta-analysis of randomized controlled trials. *Artif Organs* 2013.
 Cariello M et al. Coagulation Activation Is Associated with Nicotinamide Adenine Dinucleotide Phosphate Oxidase-Dependent Reactive Oxygen Species Generation in Hemodialysis Patients. *Antioxid. Redox Signal.* 2012

