Endothelial lesion and regeneration are critical events in the process leading to in-stent restenosis (ISR) after bare metal stent percutaneous coronary intervention (PCI).

Objectives: We prospectively investigated the relationship between markers reflecting the endothelial response to injury and the occurrence of ISR in patients undergoing PCI.

Method and results: We performed a multicentre prospective study which included 156 patients undergoing elective PCI with bare-metal stent (BMS). The endothelial lesion was assessed by the enumeration of circulating endothelial cells (CEC). Endothelial regeneration was evaluated by enumeration of circulating CD34+ progenitors cells (PC) and CD34+KDR+ endothelial progenitor cells (EPC). Measurements were performed before PCI (H0), 6 and 24 hours (H6 and H24) after. Dynamic changes were evaluated by calculating delta value (delta) of each marker. The primary and secondary end-points of the study were clinical target lesion revascularizations (TLR) and major adverse cardiovascular events (MACE) at 6 months follow-up. During follow-up, 28 MACE were recorded including 27 TLR. PCI induced a significant rise in CEC, CD34+ PC and CD34+KDR+. Baseline, H6 and H24 levels of markers did not differ between patients with and without TLR. The delta percentage of CD34+ PC expressing KDR was significantly reduced in patients with TLR compared to patients without TLR (–0.56±8.1 vs 2,91±6,2; p=0.015). In multivariate analysis, this parameter independently predicted the occurrence of TLR and MACE (p=0.02 and p=0.014 respectively).

Conclusion: In response to PCI, rather than the extent of the endothelial injury, the proportion of CD34+KDR+ mobilized among PC determines the risk of TLR and MACE.

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Symmetric dimethylarginine serum level as a new marker of left ventricular ejection fraction in patients with acute myocardial infarction

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Asymmetric dimethylarginine (ADMA) is a by-product of protein methylation implicated in the prognosis after acute myocardial infarction (MI) and heart failure through Nitric Oxide Synthase (NOS) inhibition. We aimed to investigate whether SDMA – the endogenous symmetrical stereoisomer of ADMA – that has insignificant inhibitory effects on NOS might be a marker of left ventricular function in acute MI.

Methods: Blood samples from 468 consecutive patients hospitalized <24 hours after acute MI were taken on admission. Serum levels of ADMA and SDMA were determined using high-performance liquid chromatography. Left ventricular ejection fraction (LVEF) was assessed by echocardiography at 2±1 d after admission.

Results: Among the study population, mean age was 66±14 y, most were male (77%), hypertensive (54%), with prior CAD (20%) or diabetes (20%). On admission, half had ST segment elevation MI (STEMI) (55%), and ¼ suffered from heart failure, as assessed by killip>1 (23%). Mean LVEF was 52±13%. Mean ADMA and SDMA levels were at 0.81±0.42 and 0.61±0.44, respectively. Spearman analysis showed that LVEF was correlated negatively with SDMA (r=–0.135, p=0.006), but neither with ADMA (r=–0.001, p=0.99). SDMA was strongly associated with age (r=+0.354, p<0.001), creatinine clearance (r=–0.416, p<0.001), CRP (r=+0.134, p=0.004) and homocysteine (r=+0.413, p<0.001). By univariate linear regression analysis, age, homocysteine, hypertension, diabetes, prior CAD, admission heart rate, creatinine clearance, anterior wall location, STEMI, CK peak, and acute statin treatment, in addition to SDMA, were significantly associated with LVEF (p<0.05). Backward multivariate analysis including these covariates showed that SDMA remains an independent predictor of LVEF (B=–3.422; SE=1.687, p=0.043), beyond classical determinants of LVEF including age, homocysteine and renal function.

Conclusion: Our large prospective study showed for the first time that SDMA, but ADMA, may be linked to left ventricular function in patients with acute MI, and suggests that such dimethylarginines may probably exert biological activity by other pathways than NOS activity inhibition and beyond renal function.

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Association of the porothrombin 20210GA variant with myocardial infarction in Tunisian population

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Introduction: The prothrombin is the precursor of the serine protease thrombin, a key enzyme in hemostasis and thrombosis. Prothrombin 20210GA polymorphism was described as a moderate risk factor for venous thrombosis because this mutation is associated with prothrombin elevated levels which may lead to an imbalance between the procoagulant, anticoagulant and fibrinolytic system. 20210GA curriers have an increased risk of thrombosis. In this study, we propsed to determine the prevalence of 20210GA prothrombin variant among Tunisian population, and to evaluate the potential relevance of this variant with myocardial infarction (MI).

Methods: This study included 1007 unrelated male Tunisians divided into 399 MI patients and 608 healthy controls. Both groups were aged between 35-70 years. The prothrombin 20210GA polymorphism was carried out by polymerase chain reaction/restriction fragment length polymorphism (PCR-RFLP) analysis.

Results: The distribution of genotypes was in accordance with Hardy-Weinberg equilibrium (P >0.05). A significant difference in genotype distribution and allele frequency was observed between patients and controls. Patients with MI had a frequency of 97% for GG genotype and 3% for GA + AA genotype. The control group had a frequency of 99% for the GG genotype and 1% for the GA + AA genotype (χ2=6.95, p=0.031). The MI patient group showed a significant higher frequency of the 20210A allele compared to the controls 0.02 vs. 0.01 [OR=3.60 (95% CI=1.29-10.53), p =0.005].

Conclusion: Our work showed a significant association between the 20210GA polymorphism of the prothrombin gene and MI in theTunisian population.

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Heart rate variability in the first five minutes of the tilt test to predict syncope?

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Purpose: Vasovagal syncope mechanisms, diagnostic tools and treatments are currently strongly explored and debated. The aim of this study is to specify the early cardiac autonomic adaptations to tilt test in negative and positive (cardio-inhibitory and vasodepressor) subjects.

Method: Healthy men (n=81) from 18 to 35 years old underwent a 45 min 80° tilt test after a 15 min rest. Three clinicians independently classified each test results according to the VASIS classification: negative (NEG), mixed, cardio-inhibitor (CI) or vasodepressive (VD) syncope. Only three groups were studied: the NEG (n=13), CI (n=11) and VD (n=8). ECG recorded during 5 min of resting (Rest5) and the first 5 min of the tilt test (Early5) were compared within and between groups. ECG signals were analysed with the validated algorithm Segmenta (LTSI, Rennes) to calculate usual HRV parameters: Ptot, LF, HF, LFnu, HFnu.

Results: *First,* within group comparisons showed that in NEG subjects from Rest5 to Early5, HF and HFnu decreased (p<0,01) and LF (p<0,05) and LFnu (p<0,01) increased. VD subjects showed similar responses (p<0,05), except for HF indices (NS). In CI subjects LF and HF indices weren't significantly different between Rest5 and Early5. *Second,* between groups comparisons of the relative adaptations (%) from Rest5 to Early5 showed that the increase in LFnu was higher in NEG (+180±80%) than in CI (+66±50%) (p<0,01). HFnu decrease was also higher in NEG (–66±5%) than in CI (–38±9%) (p<0,05).

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