

ATHEROTHROMBOSIS

339 Interplay between COVID-19, pollution, and weather features on changes in the incidence of acute coronary syndromes in early 2020

Simone Griffo¹, Achille Gasparone², Alessandro Danesi³, Fabio Ferranti⁶, Enrica Mariano⁵, Francesco Rotolo⁷, Carmine Musto⁸, Alessandro Di Giosa⁹, Giada Marchegiani⁹, Giuseppe Biondi Zoccai⁴, and Francesco Versaci¹
¹Ospedale Santa Maria Goretti, ²Ospedale Sant'Eugenio, ³Ospedale Santo Spirito, ⁴Sapienza Università di Roma, ⁵Università tor Vergata, ⁶Ospedale G. B. Grassi, ⁷Ospedale San Pietro-Fatebenefratelli, ⁸Ospedale San Camillo, ⁹ARPA Lazio

Aims: Coronavirus disease 2019 (COVID-19) has caused an unprecedented change in the apparent epidemiology of acute coronary syndromes (ACS). However, the interplay between this disease, changes in pollution, climate, and aversion to activation of emergency medical services represents a challenging conundrum. We aimed at appraising the impact of COVID-19, weather, and environment features on the occurrence of ST-elevation myocardial infarction (STEMI) and non-ST-elevation myocardial infarction (NSTEMI) in a large Italian region and metropolitan area.

Methods and results: Italy was hit early on by COVID-19, such that state of emergency was declared on January 31, 2020, and national lockdown implemented on March 9, 2020, mainly because the accrual of cases in Northern Italy. In order to appraise the independent contribution on changes in STEMI and NSTEMI daily rates of COVID-19, climate and pollution, we collected data on these clinical events from tertiary care cardiovascular centers in the Lazio region and Rome metropolitan area. Multilevel Poisson modeling was used to appraise unadjusted and adjusted effect estimates for the daily incidence of STEMI and NSTEMI. The sample included 1448 STEMI and 2040 NSTEMI, with a total of 2882 PCI spanning 6 months. Significant reductions in STEMI and NSTEMI were evident already in early February 2020 (all $P < 0.05$), concomitantly with COVID-19 spread and institution of national countermeasures. Changes in STEMI and NSTEMI were inversely associated with daily COVID-19 tests, cases, and/or death ($P < 0.05$). In addition, STEMI and NSTEMI incidences were associated with daily NO₂, PM₁₀, and O₃ concentrations, as well as temperature ($P < 0.05$). Multi-stage and multiply adjusted models highlighted that reductions in STEMI were significantly associated with COVID-19 data ($P < 0.001$), whereas changes in NSTEMI were significantly associated with both NO₂ and COVID-19 data (both $P < 0.001$).

Conclusion: Reductions in STEMI and NSTEMI in the COVID-19 pandemic may depend on different concomitant epidemiologic and pathophysiologic mechanisms. In particular, recent changes in STEMI may depend on COVID-19 scare, leading to excess all-cause mortality, or effective reduced incidence, whereas reductions in NSTEMI may also be due to beneficial reductions in NO₂ emissions in the lockdown phase.

510 Mother and daughter: two sides of the same coin

Francesco Ceravolo¹, Antonella Romaniello², Camillo Autore², and Massimo Volpe²
¹Università Sapienza di Roma, ²azienda Ospedaliera Universitaria Sant'Andrea

Most of the coronary events are due to atherosclerosis and its complications, though about the 20% of coronary heart disease in young adults is related to other pathologies such as coronary abnormalities, autoimmune diseases and connective tissue disorders. The last two of these conditions are also associated to an increased risk of thromboembolic events. We report a case of a 41-year-old woman, with two unexplained miscarriages and no cardiovascular risk factors, who had an ST-elevation myocardial infarction complicated by several episodes of ventricular fibrillations, and of her daughter, a 20-year-old-woman, previously healthy, who had, a few days later her mother's admission, a massive pulmonary embolism with syncope at presentation. Laboratory tests demonstrated the presence of anticardiolipins antibodies of IgG isotype in both patients' serum. With this case report we want to focus on the importance of considering acute myocardial infarction caused by an unexplained intracoronary thrombosis or pulmonary embolism such as first manifestations of pro-thrombotic states, especially in young patients. Early diagnosis of these conditions, in fact, is crucial because it might entail therapeutic implications not only on the short-term (i.e., rapid diagnosis and treatment of catastrophic antiphospholipid syndrome) but also on the long-term patient management.

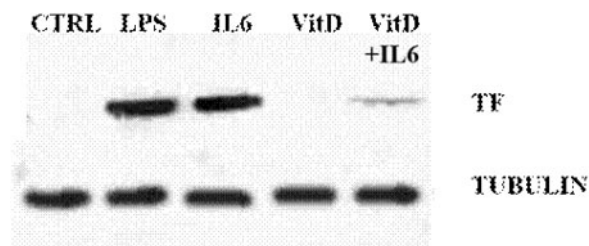
487 Vitamin D inhibits tissue factor in IL6 treated endothelial cells by modulating NFKB pathway

Mariarosaria Morello¹, Grazia Pellegrino¹, Stefano Conte², Laura Marra⁴, Andrea Morello³, Paolo Golino², Plinio Cirillo¹, and Giovanni Cimmino¹
¹Department of Advanced Biomedical Sciences, University of Naples Federico II, Naples, Italy, ²Department of Translational Medical Sciences, University of Campania Luigi Vanvitelli, Naples, Italy, ³Biochemical Laboratory, Cardarelli Hospital, Campobasso, Italy, ⁴Research Department, Cellular Biology and Biotherapy Unit, Pascale Foundation, Naples, Italy

Aims: Inflammation plays an important role in the pathophysiology of athero-thrombosis. Many evidences have clearly indicated that endothelial cells stimulated with inflammatory mediators show an athero-thrombotic phenotype, since they express adhesion molecules and Tissue Factor (TF) on their surface. IL-6 seems to have a central role in modulating these phenomena. Patients with elevated plasma levels of IL-6 have as higher risk to develop acute cardiovascular events (ACS). Epidemiologic studies have demonstrated that Vitamin D (VitD) deficiency is associated with the increased risk of ACS. Here, we have investigated whether VitD might modulate TF expression in IL-6 treated endothelial cells.

Methods and results: HUVEC cultivated in medium enriched with VitD (10 nM) were stimulated with IL-6 (0,5 ng/mL). TF gene (RT-PCR), protein (western blot), surface expression (FACS) and procoagulant activity (FXa generation assay) were measured. NF- κ B translocation was also investigated. VitD significantly reduced TF gene as well protein expression and procoagulant activity in oxLDL-treated HUVEC. These effects were associated with VitD modulation of NF- κ B pathway.

Conclusion: This study, although in vitro, shows that VitD prevents the pro-thrombotic effects of IL-6 on endothelial cells by inhibiting TF expression. Thus, we might speculate that this is one of the mechanisms by which VitD exerts its protective cardiovascular effects.



107 Anticoagulation in atrial fibrillation: not only the risk of stroke: a case report

Gaetana Ferro¹, Nertil Kola¹, Agnese Bevilacqua¹, Lorenzo Iuliano¹, Claudia Vicidomini¹, and Luigi Tedesco¹
UO Cardiologia UTIC, Ospedale "Santa Maria Della Speranza", Battipaglia (SA)

A C a 74 years old female patient with history of hypertension in treatment with ramipril 10 mg/die, reports dyspnoea for some time, exacerbated by mild physical exertion. No palpitation, chest pain or syncope is reported. An electrocardiogram is immediately performed which shows atrial fibrillation, not reported in her clinical history and not present in an electrocardiogram of two months before, brought into view by the patient. When questioned again, the patient reports that she has never experienced palpitations in the previous two months or in the past. The only significant anamnestic data is a recurrent abdominal pain, for which she had recently performed abdominal ultrasound, gastroscopy and colonoscopy which had not highlighted any significant pathologies. Considering the poor tolerance to arrhythmia despite a good heart rate control with b-blockers, an electrical cardioversion of atrial fibrillation is indicated and therefore a transesophageal echocardiogram is performed to search for any cardiac thrombotic formation. The exam highlights a large jelly-like thrombus at the level of the left appendage. The patient starts an anticoagulant therapy with NOAC for 3 weeks. In parallel, the presence of the thrombus associated to abdominal pain suggests a likely ischaemic origin of the symptoms so the patient undergoes an abdominal angio-CT scan that, surprisingly, doesn't highlights a thrombotic disease of the mesenteric arteries. After the treatment with oral

anticoagulant the patient undergoes an electrical cardioversion of AF which is effective. Questioned before the cardioversion, she reports a marked improvement in abdominal pain symptoms since the start of NAO therapy and, 1 month later she reports the complete resolution of the abdominal symptoms. This outcome associated to la lack of evidence about a mesenteric ischemia al the CT scan made us postulate the responsibility for microemboli, originating from left appendage and reaching intestinal smallest vessels in determining the symptomatology without CT detectable lesions. Atrial fibrillation is the most frequent sustained arrhythmia with a general prevalence of 5-1%. The prevalence is relatively low among young people, but increases with age reaching 8.8% among 80-89 years old. This clinical case, in its simplicity, wants to highlight the need to consider in addition to the well-known stroke risk linked to this arrhythmia, also the not negligible effect that systemic embolism may have on other organs and systems. For that reason it is mandatory to have a multidisciplinary approach to the most common pathologies, especially in elderly population.

428 Phosphorylcholine-coated circuit prevents the formation of platelet-leucocyte aggregates

Marco Mattioli¹, Milena Nasi¹, Greta Mascheroni², Mara Malerba¹, Salvatore Colletto², Italo Ghidoni², Davide Gabbieri², Paolo Cimato², Marcello Pinti¹, Anna Vittoria Mattioli¹, Marco Meli², and Andrea Cossarizza¹

¹University of Modena and Reggio Emilia, ²Hesperia Hospital

Extracorporeal circulation (ECC) involves the contact of blood cells with artificial surfaces, which could lead to adverse effects, such as hemostasis disorders. During ECC, platelets (PLT) and leukocytes can be activated causing their aggregation. This study aimed to evaluate the thrombogenic potential associated with a blood-recirculating device by identifying the changes over time of the platelet-leukocytes aggregates. Thus, we quantified the percentage of PLT-granulocytes (P-G), -monocytes (P-M), and -lymphocytes (P-L) aggregates during procedures that required a phosphorylcholine-coated (PC) mechanical pump for ECC. Our preliminary analyses are referred to three patients (two females and one male) who underwent a procedure of aortic valve replacement. We collected 1 mL of arterial blood at three times directly from

the mechanical pump (INSPIRE 6F, Livanova, Sorin Group Italia Srl, Italy): before initiating the extracorporeal perfusion (T0, before the heparin injection), after 70 ± 23 min (T1), and at the end of ECC (T2; 138 ± 81 min). Two hundred uL were stained immediately with CD45-PE, CD14-APC, CD42a-BV421 (from R&D System, BioLegend, and Beckman Coulter, respectively), washed with BD FACS Lysing Solution and, then, acquired with an Attune NxT (Thermo Fisher Scientific). Granulocytes, monocytes, and lymphocytes were identified among CD45+ cells, based on their physical parameters. Monocytes were further identified as CD14+ cells. Among the three leukocytes populations, the percentage of aggregates was identified using the PLT marker CD42a. The Figure below shows the representative dot plots for the gating strategy and the representative histograms of the aggregate count at different times of collection. As reported on the right side of the Figure, the percentage of aggregates remains similar during the surgical procedures (P < 0.05; Two-way ANOVA fro repeated measures). Our study confirms that a PC-coated circuit not only improves PLT preservation (Schulze et al. J Card Surg 2009) but also prevents aggregates formation.

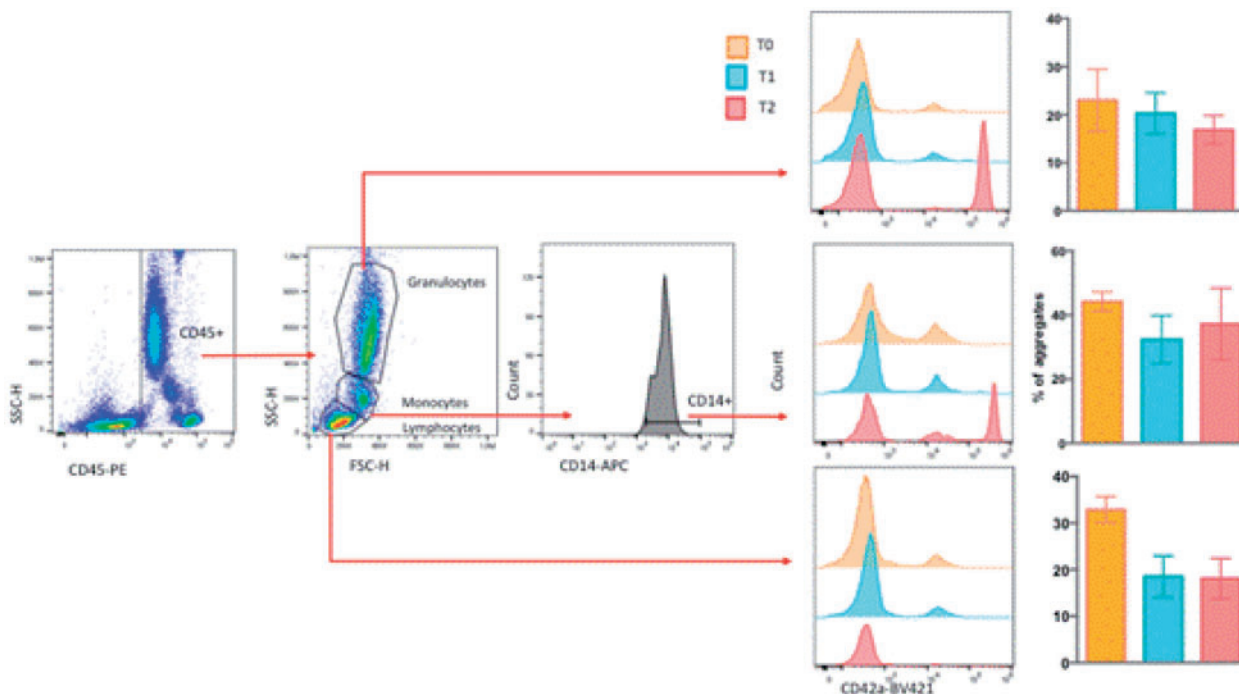
120 A curious case of massive right heart thrombosis

Jessica Artico¹, Marco Merlo¹, Giancarlo Vitrella¹, Giulia De Angelis¹, Rossana Bussani¹, Lorenzo Pagnan¹, Manuel Belgrano¹, and Gianfranco Sinagra¹
Azienda sanitaria universitaria Giuliano Isontina, University of Trieste

Aims: Intraventricular masses are a relatively rare condition ranging from asymptomatic to potentially life-threatening situations.

Methods and results: Herein, we report a case of a 49 years old woman under investigation for a massive right ventricular mass who underwent complete investigation for possible differential diagnosis, in the suspect of right ventricular tumour. Surgical removal of the mass showed a large area of stratified thrombosis with an underlying area of endocardial fibrosis. The patient has been then discharged in good clinical condition and with lifetime oral anticoagulation.

Conclusion: Massive right ventricular (RV) thrombosis is a rare yet potentially fatal condition. Invasive management is preferable and lifetime anticoagulation is required to reduce possible downstream thrombotic complications.



428 Figure