718 Cardiac injury following immunization with mRNA SARS-CoV-2 vaccines

Antonio Gianluca Robles1,2, Massimo Vincenzo Bonfantino1, Aldo Agea3, Giovanni DeLuca4, Maria Consiglia Bellino5, Pasquale Caldarola6, Leonardo Calò6, Maria Penco7, Silvio Romano2, and Luigi Sciarra4,6

1Cardiology Unit, Di Venere Hospital, Bari, Italy, 2Department of Life, Health and Environmental Sciences, University of L’Aquila, L’Aquila, Italy, 3Cardiology Unit, ‘Mons. Dimiccoli’ Hospital, Barletta, Italy, 4Department of Emergency and Organ Transplantations, University of Bari, Bari, Italy, 5Cardiology Unit, San Paolo Hospital, Bari, Italy, and 6Cardiology Unit, Policlinico Casilino, Rome, Italy

Aims: Cardiac involvement as myocarditis and/or pericarditis is now recognized as a rare but possible adverse event following SARS-CoV-2 mRNA vaccines. In this brief report we describe a series of four subjects: three of them with myocarditis and one with pericarditis probably due to hypersensitivity and developed in temporal association with COVID-19 mRNA vaccination.

Methods and results: During last summer, we observed a series of four young Caucasian male [median (range) age, 25 (18–32) years] presenting to the Emergency Department with severe acute chest pain within few days after second dose COVID-19 mRNA vaccine administration [median (range), 3 (2–5) days]. All of these were previously healthy and fitness males. All patients had abnormal electrocardiogram (EKG) and three of them had elevated high sensitive cardiac troponin (hs-cTnI) levels. These latter three were diagnosed as having myocarditis and underwent cardiac magnetic resonance imaging (CMR). None had acute or prior COVID-19 or pulmonary disease on chest X-ray. Moreover, ischaemic injury, other infections, adverse drug reactions or any autoimmune diseases were excluded by appropriate tests. All patients underwent ecocardiography which showed preserved ejection fraction and no wall motion abnormalities and it excluded coronary origin abnormalities in each patient. The hospital course was uneventful for all four patients and they were discharged within few days of hospitalization [median (range), 6 (3–8) days] after a conservative treatment. The four patients met CDC criteria for probable myocarditis and pericarditis. To date, it is recognized a possible clinical correlation between cardiac injury and SARS-CoV-2 mRNA vaccination. The following elements support this hypothesis: (i) short time lapse between vaccine administration and symptoms onset;
(ii) onset after the second dose suggesting an immune-mediated pathogenesis needing a previous sensibilization; (iii) exclusion of other possible damage causes (ischaemia, infections, other immune-mediated diseases, toxicity). In particular, we did not perform coronary angiography given the low pre-test probability of coronary heart disease. Although comprising a small sample, our report includes a patient series with clinical features similar to those frequently encountered into other papers: i.e. a prevalence in young males without risk factors; symptoms onset within few days second dose administration; an eventful clinical course. This benign course, seen in the majority of cases in literature, raises the question of the need for specific therapy or an empirical one for symptoms control only. Our report suggest that possible cardiac involvement can range from isolated pericarditis to myocarditis with significant hs-cTnI raise and signs of acute inflammation at CMR or even a myocardial injury with a mild hs-cTnI raise in absence of pathological signs at CMR. This latter case suggests also a possible cardiac injury with subclinical course.

Conclusions: To date, we are observing a temporal association linking mRNA SARS-CoV-2 vaccines administration and cardiac involvement. According to the majority of papers, our experience suggests an acute benign course of such cardiac involvement; a longer follow-up will also reveal a long-term benign course or conversely the presence of any sequelae. Clinicians should adequately inform patients when receiving vaccine to ensure prompt symptoms recognition and consequently put in place the best management of myocarditis/pericarditis. Finally, it is important to keep in mind that the benefits of vaccines far outweigh the risks.