A case report of an electrical storm following an acute myocardial infarction

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Introduction: An electrical storm is a condition of cardiac electrical instability characterized by several episodes of ventricular tachycardia (VT) or ventricular fibrillation (VF) within 24 hours, requiring medication and/or defibrillation, with a death rate ranging from 22 to 82%.[1] The treatment of an electrical storm is determined by the etiology; therefore, for acute coronary syndrome, percutaneous coronary intervention is the method of choice, whereas radiofrequency catheter ablation is the method of choice for VT. Hemodynamically unstable patients frequently require mechanical circulatory support, such as extracorporeal membrane oxygenation (ECMO). This paper describes the case of a younger patient presenting with an ST-segment elevation myocardial infarction, which was complicated by cardiorespiratory arrest, refractory VF, and cardiogenic shock, and who required ECMO to stabilize the condition.

Case report: This is a 42-year-old male who presented to the Bjelovar General Hospital on September 9, 2023, with acute chest pains, tingling in both limbs, and short-term dizziness. The patient is admitted with no electrocardiographic symptoms of a myocardial infarction and normal laboratory values; therefore, nitrite treatment is administered. After 2 hours, the patient complains of pain again, which he rates at 10/10 on the visual analogue scale, as well as indicators of an acute myocardial infarction, prompting the transfer to the University Hospital Centre Zagreb. During the patient's transport, a cardiorespiratory arrest occurs due VF, and defibrillation is performed four times with the use of adrenaline. On arrival, the patient is somnolent, hypotensive, tachydyspnoic, and has audible rales, for which he is sedated, intubated, and mechanically ventilated. Following intubation, the patient becomes rhythmically unstable and falls into cardiac arrest, at which point resuscitation is initiated in accordance with the ALS protocol. Because of the electrical storm, which is caused by refractory VF, the resuscitation method requires the insertion of a peripheral veno-arterial ECMO. The period between the beginning of CPR and the initiation of the ECMO system was 20 minutes. Following the condition's stabilization, an urgent coronary angiography was performed to identify a thrombotic obstruction of the LAD, followed by percutaneous intervention with aspiration thrombectomy and placement of a drug-eluting stent. A favorable clinical response is observed following the intervention, with inotropic support of dobutamine, with an improvement in hemodynamic status, recovery of pulsatility, reduction of flow on the ECMO system, normalization of acid-base status and lactate values, and recovery of hourly diuresis. The initial ultrasound of the heart revealed severely impaired left ventricular systolic function (LVEF 25%) with preserved right ventricular function, whereas the control ultrasound on September 11 revealed recovery of systolic function (LVEF 50%), and the patient was successfully weaned from the ECMO system. After the sedation is removed, the patient's neurological recovery is evaluated, and the patient is transferred to the Department. On the ninth day of hospitalization, the patient is discharged home with a recommendation for cardiac rehabilitation.

Conclusion: An electrical storm is a potentially lethal situation that requires rapid reaction and multidisciplinary patient treatment. In this case, prompt defibrillation and insertion of the ECMO systems supported urgent coronary angiography, resulted in optimum flow through the coronary arteries, and saved the patient's life.

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LITERATURE

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