Tako-tsubo cardiomyopathy observed in a patient with sepsis and transient hyperthyroidism

Cardiomiopatia Tako-tsubo osservata in un paziente con sepsi e ipertiroidismo transitorio

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ABSTRACT: Tako-tsubo cardiomyopathy observed in a patient with sepsis and transient hyperthyroidism.

A 55-years old woman, with a history of hypertension and ischemic stroke with residual left hemiparesis, was admitted to our hospital because of dyspnoea with clinical evidence of acute pulmonary edema. She was found to have a sinus tachycardia with ST-elevation in leads D1, aVL and V1-V4 in the electrocardiogram, and akinesis of the left ventricular apex with overall left ventricular systolic function being severely impaired and an ejection fraction of 28% on echocardiography. Orotracheal intubation was performed and mechanical ventilation was immediately started. Emergency cardiac catheterization was performed 2 h after the symptom onset. Coronary angiography showed no significant coronary artery disease. Blood analysis revealed an increase in the creatine kinase MB fraction, a significant positive detection in troponin T, a white blood cell count of 35000 per microliter, C-reactive protein of 59.9 mg/dl, and transient elevation in the concentration of free triiodothyronine, free thyroxine, thyroid globulin antibody, and thyroid peroxidase antibody. The symptoms improved during the next days, and follow-up echocardiography 18 days later showed complete resolution of the left ventricular dysfunction.

These data suggest that tako-tsubo cardiomyopathy may be induced in patients with sepsis and transient hyperthyroidism.

Keywords: Tako-tsubo cardiomyopathy, sepsis, transient hyperthyroidism, ventricular function.

Blood analysis revealed an increase in the creatine kinase MB fraction (plasma peak was 75,98 ng/ml), a significant positive detection in troponin T (plasma peak was 2,850 ng/ml), a white blood cell count of 35,540 per microliter with 87.5% of neutrophils, C-reactive protein of 59.9 mg/dl. The results of thyroid function test were as follows: thyroid stimulating hormone (TSH): 0.005 uU/ml (normal range, 0.270 - 4.200), free triiodothyronine (fT3): 7.44 pg/ml (normal range, 2.00 - 4.40), free thyroxine (fT4): 3.28 ng/ml (normal range, 0.93 - 1.70), thyroid globulin antibody: 3000 UI/ml (normal range, < 40), thyroid peroxidase antibody: 1000 UI/ml (normal range, < 35), TSH receptor antibody: 69.5% (normal range, < 15.0).

After the achieved of stable hemodynamic conditions, the patient was transferred to our Cardiology Division, to correctly define the etiology of electrocardiografic and echocardiographic alterations.

Based on the findings, we diagnosed Tako-tsubo cardiomyopathy associated with sepsis and hyperthyroidism. Staphylococcus cohnii ssp cohnii was detected in cultures from both blood and urine. Although tests to confirm a diagnosis of acute myocarditis was also performed (identification of the virus in stool, throat washings, blood, or by a distinct increase in virus-neutralizing antibody, complement-fixation, or hemagglutination inhibition titers, and cardiac biopsies on the seventeenth day), there was no evidence of acute myocarditis. The patient never experienced further symptoms after treatment with levofloxacin (500 mg b.i.d), prednisone (12.5 mg once a day), propranolol (20 mg t.i.d), ramipril (10 mg once a day), tiamazol (5 mg b.i.d), amlodipine (5 mg once a day), and cardioaspirin (100 mg once a day).

The electrocardiography revealed normalization of the elevated ST segment and inversion of T wave in leads D1, D2, aVL, and V2 through V6 on the twenty-third day (Figure 3). The echocardiogram 18 days after hospitalization showed completely normal left ventricular kinesis, with complete regression of apical dilation and akinesis previously evidenced (Figure 4). The thyroid function gradually recovered, as so as improvement of infection (white blood cell was normalized when she was discharged). Six months later, she was in euthyroid state and free from symptoms.

**Discussion**

“Tako tsubo cardiomyopathy” or transient left ventricular apical ballooning is a recently identified syndrome whose clinical presentation is similar to that of acute myocardial infarction (AMI) with acute
Acute phase. Finally, the increases in the thyroid hormone concentrations might directly influence the myocardium, although we cannot explain why the wall motion abnormalities were present only in the apex. Generally, hyperthyroid patients are in a high output state in the absence of symptomatic heart failure because of a lower systemic vascular resistance and increased sodium reabsorption and blood volume. However, in a small subset of patients with persistent sinus tachycardia or atrial fibrillation, low output heart failure (hyperthyroid cardiomyopathy) can develop and is reversible when euthyroid state is re-established [4, 16-18]. Several investigations have reported that thyroid hormone interacts with catecholamines such that hyperthyroid patients have an increased sensitivity to catecholamine action [19-20].

In conclusion, we presented an unusual case of Tako Tsubo cardiomyopathy associated with sepsis and transient hyperthyroidism. Sepsis and hyperthyroidism should be considered as a possible cause of cardiac wall motion abnormalities.

References


