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Case Report

A Case of Type 1 Kounis Syndrome Induced by Angong Niuhuang Pill in a Patient Vaccinated with COVID-19 Vaccine

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Abstract

Kounis syndrome refers to an acute coronary syndrome, consequent to an allergic reaction. It results from mast cell degranulation with subsequent release of numerous inflammatory mediators, leading to coronary vasospasm, atheromatous plaque rupture, or stent thrombosis. But many cases may be missed or underdiagnosed. Here, we report a case of Kounis syndrome induced by Traditional Chinese Medicine in a patient vaccinated with COVID-19 vaccine.

Learning objective: Kounis syndrome is an acute coronary syndrome, consequent to an allergic reaction. Cytokine release might precipitate coronary spasm, plaque rupture, or stent thrombosis. Kounis syndrome is not rare disease, but many cases may be missed or underdiagnosed. Our case serves as an example for clinicians to consider the possibility of Kounis syndrome in patients with acute coronary syndrome and anaphylaxis in order to ensure appropriate treatment.

Keywords: Kounis syndrome; Acute coronary syndrome; Allergic reaction; COVID-19 vaccine

Introduction

Kounis syndrome is a kind of allergic acute coronary artery disease caused by exposure to drugs, food, environmental factors, etc. It was first proposed by Kounis and Zavras in 1991, and is a group of characteristic clinical manifestations of allergic acute coronary syndrome. Although Kounis syndrome is not rare disease, but many cases may be missed or underdiagnosed. Here, we report a case of Kounis syndrome induced by Traditional Chinese Medicine in a patient vaccinated with COVID-19 vaccine.

Case Presentation

The 48-year-old male patient presented to hospital due to general discomfort, chest tightness, wheezing, sweating and unconsciousness for 12 hours after taken Angong Niuhuang pill. Patients received COVID-19 vaccination 2 days before admission, taken orally Angong Niuhuang pill 1 day before admission, General malaise 12 hours before admission, Pre-cardiac stuffy pain, chest stuffy suffocating, gasping, sweating all over the body, Subsequently, transient loss of consciousness occurred with urinary and fecal incontinence. The patient presented with blood pressure of 50/30 mmHg. After the recovery of consciousness, mental irritability, slurred speech, palpitations, nausea and vomiting, dizziness and headache, the symptoms were not relieved, and the right limb movement was adverse, so he was admitted to the hospital for further diagnosis and treatment. The patient had been suffering from hypertension for more than 10 years. The patient denied the history of bronchial asthma and obstructive pulmonary disease. physical examination: blood pressure of 90/50 mmHg, heart rate of 104 bpm, breathe of 30 bpm. The patient's spirit was restless, aphasia, left deviation of tongue extension, bilateral pupil was unequal, poor light reflection. The whole-body skin without yellow dye, the conjunctiva was pale, no liver palm and spider nevus, the pale lips, soft neck, no jugular vein irritation. Auscultation revealed bilateral sound was clear, moist and dry. Heart rate of 104 bpm, rhythm, valve auscultation area unheard and murmur, no abdominal varicose veins and gastrointestinal peristalsis wave, flat, soft abdomen, no obvious tenderness, no rebound pain, no lump, no liver, spleen, no percussion pain, negative mobile turbidity, bowel sound normal, lower limbs without edema, right limb muscle strength grade 0, left muscle strength was normal, bilateral positive. Blood routine examination: White blood cell 38.45 $\times 10^9$/L, Neutrophil percentage 82.40%, Eosinophil percentage 0.10%, Red blood cell 4.73 $\times 10^{12}$/L, Hemoglobin 152.00 g/L, Platelet 83.00 $\times 10^9$/L; Biochemical examination: Glucose 4.98 mmol/L, Urea 11.2 mmol/L, Creatinine 207.5 umol/L, Uric acid 628.7 umol/L, Carbon dioxide binding force 15.5 mmol/L; Potassium 3.7 mmol/L, Sodium 141.2 mmol/L, Chlorine 108.9 mmol/L; Creatine kinase 267.0 U/L, Creatine kinase isoenzyme 49.30 U/L, Troponin-I 5.67 ng/ mL. The arterial blood gas test showed PH 7.292, partial pressure of carbon dioxide 26.20 mmHg, partial pressure of oxygen (T) 98.20 mmHg, lactic acid 4.60 mmol/L, C-reactive protein 20.0 mg/ dL; D-dimer 5599.93 ng/ mL, partial thrombin time 32.4 seconds, Immunity: IgM17.8, Complement C3 52.7 were decreased. N-terminal B-type natriuretic peptide precursor 1134.1 ng/L; Low density lipoprotein cholesterol 1.10 mmol/L, Total cholesterol 2.99 mmol/L; The

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electrocardiogram showed sinus rhythm, ST segment elevation in II, III, and aVF leads., pathological Q waves in III and aVF leads, Figure 1. Echocardiography: compression of the right heart (insufficient volume), reduced stage movement of the left inferior wall, ejection fraction 53%, decreased diastolic function of the left ventricle, pericardial effusion (medium, limited). Coronary CTA suggested pericardial effusion, right dominant coronary artery type, no obvious coronary artery stenosis, no obvious pulmonary embolism, Figure 2. Emergency head MRI: bilateral cerebellar hemisphere, bilateral fronto-parietal lobe, bilateral paraventricular cerebral infarction, bilateral coronal radiation area, lateral paraventricular cerebral infarction, Figure 3. Abdominal aortic CTA suggested abdominal aortic sclerosis with mural thrombosis, superior mesenteric artery mural thrombosis. Diagnosis and treatment: The patient was diagnosed with coronary heart disease, acute inferior wall myocardial infarction, multiple acute ischemic cerebral infarction, anaphylactic shock and Kounis syndrome based on the characteristics, symptoms, signs, biochemical laboratory examination, cardiogram, CTA and cranial MRI. After admission, the patient was given vital signs monitoring, sedation, large amount of fluid replacement, dopamine pressure boosting, coronary artery dilation, cerebral circulation improvement, anti-infection treatment. Review of cardiac ultrasound: left atrial enlargement in the basal segment of the inferior wall of the left ventricle presents a hypodynamic change, ejection fraction 58%, massive pericardial effusion. In front of the anterior wall of the right ventricle, about 25.2 mm liquid dark area can be seen, in the posterior and lateral wall of the right ventricle, about 16.7 mm liquid dark area can be seen, in the lateral wall of the left ventricle, about 23.3 mm liquid dark area can be seen. Pericardial puncture and drainage were performed to extract 1500ml of hemorrhagic fluid. Pericardial effusion biochemistry: total protein 32.3 g/L, chlorine 117.5 mmol/L, lactate dehydrogenase 5006.8 U/L, glucose 10.58 mmol/L. Pericardial effusion routine: The total cell count was 253.522 × 10^9/L, white blood cell count was 0.522 × 10^9/L, polykaryotic cells were 38%, monocytes were 62%. Bacterial culture of pericardial effusion was negative, and no tumor cells were found in pathology. After the stabilization of the disease, coronary angiography was completed show unobstructed blood flow in three coronary arteries, no coronary stenosis, and no dissection of the aorta. After 17 days of hospitalization, the patient was discharged from the hospital. After 1 month of outpatient follow-up, there was no chest tightness, wheezed, sweating, and free movement of limbs, with no sequelae. The electrocardiogram showed that sinus rhythm, no ST segment changes were observed, echocardiography indicated left atrial enlargement, small pericardial effusion, and no segmental dyskinesia.

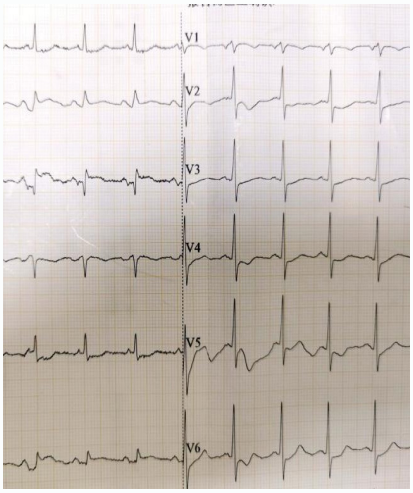

Figure 1: ST segment elevation in II, III, and aVF leads, pathological q waves in III, and aVF leads, and V1-V6 leads response depression.

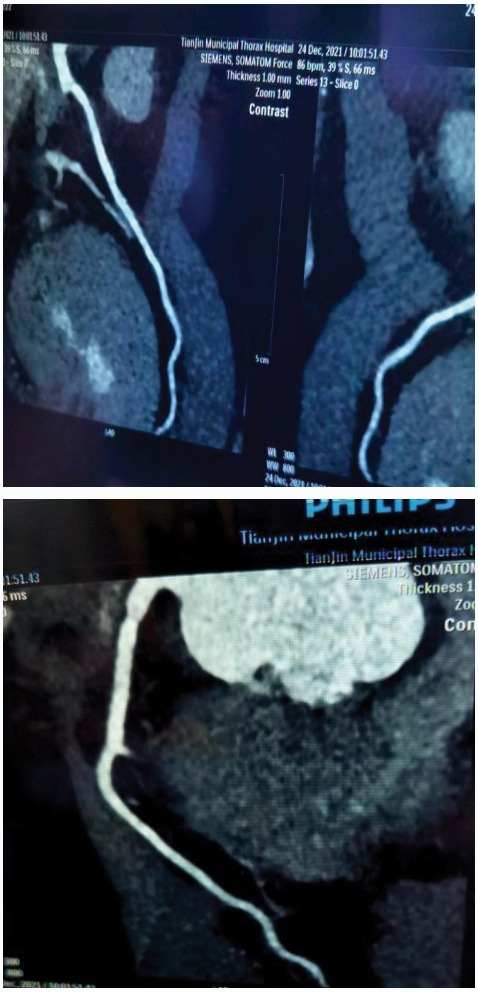

Figure 2: Coronary CTA indicated no significant stenosis of left coronary artery LAD CLX or RCA.

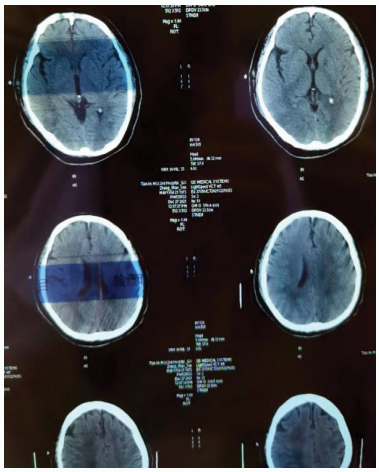

Figure 3: Brain CT showed acute ischemic infarction in bilateral frontal, parietal, occipital and paraventricular lobes.

Discussion

Kounis syndrome is a kind of allergic acute coronary artery disease caused by exposure to drugs, food, environmental factors, etc. It was first proposed by Kounis and Zavras in 1991 [1]. This disease is not a rare disease in clinical practice, but it is easy to be misdiagnosed and missed. At present, people have found a variety of triggers for KS, among which the use of antibiotics is the most common, accounting for 47.4%, followed by the bite of ptera insects, accounting for 23.4%. However, there are few reports about Kounis syndrome induced by Traditional Chinese medicine. It has been reported that Lu Gua Shuang Tai can induce Kounis syndrome [2]. Angong Niuhuang pill is a commonly used Chinese medicine. Its main ingredients are bezoar, buffalo horn, vermilion, realgar, musk and so on. It has been reported that it can cause a small side effect, such as general discomfort, hypothermia, body rash, hypotension, and even allergic reactions, mercury poisoning and arsenic poisoning [3]. It is worthy of high clinical attention that in this case, the patient showed severe general discomfort, sweating, severe hypotension and other symptoms of anaphylactic shock accompanied by atrial fibrillation and acute inferior wall myocardial infarction, suggesting that Angong Niuhuang pill may be the potential cause of induction, worthy of high clinical attention. Its occurrence and allergic reaction, resulting in a large number of releases of inflammatory mediators, such as: histamine, neutral protease, arachidonic acid, Platelet Activating Factor (PAF), and a variety of cytokines and chemokines, these substances on the mast cell FceR1 crosslinking, mast cell activation and degranulation, IgE antigen further activation of the complement system appears [4]. These factors cause systemic vasoconstriction, including coronary artery constriction. In addition, they lead to decreased cardiac output, increased left ventricular end-diastolic pressure, increased severe acute respiratory resistance, pulmonary interstitial edema, and ultimately reduced perfusion of multiple viscera, brain, and myocardium [5,6]. This case was induced by the administration of Traditional Chinese medicine after the vaccination of COVID-19 vaccine, suggesting that multiple antigens have a superposition effect, which can aggravate the allergic reaction and lead to the activation of mast cells and the release of a large number of inflammatory mediators. In addition, IgE antibodies with different specificity may have a superimposed effect, that is, a small, even subthreshold amount of IgE can induce inflammatory cells to release their mediators, inducing an allergic response [7]. This case also showed multisite thrombosis and multilacunar hemorrhagic effusion, which was another characteristic clinical manifestation of this patient. Studies have shown that COVID-19 vaccine-induced thrombotic events may be associated with immune thrombocytopenia and bleeding after thrombosis, Similar to autoimmune Heparin-Induced Thrombocytopenia and Thrombosis (HITT), particularly severe Cerebral Arterial and Venous Thrombosis (CVST), high levels of antibodies to Platelet Factor 4 (PF4) were detected in these patients. Thrombin production plays a major role in CVST and thrombus formation, which constitutes Kounis anaphylaxis associated thrombotic syndrome and HIT-like thrombosis, a novel manifestation of Kounis syndrome [8]. Anaphylaxis from COVID-19 vaccination is of great concern. While the incidence is low, it can sometimes lead to serious complications. This allergic reaction is directed against vaccine-specific interactions between immunoglobulin E(IgE) antibodies via Fcy receptor-1 activation of mast cells. Studies have shown that almost any vaccine component can be a trigger for a potential allergic reaction, including inactivated or killed viruses, coupling agents, preservatives, stabilizers, and antimicrobials [9]. Treatment of type I Kounis syndrome benefits from the treatment of anaphylaxis, that allergen removal, active fluid replacement, hemodynamic stability maintenance, antiallergic medication, and close monitoring of vital signs. H1 and H2 antihistamines, such as Diphenhydramine, Ranittidine can relieve spasmodic, nettle, and angioedema and can be used as supportive therapy. The onset of this case is extremely dangerous, but the patient recovered completely, suggesting that type I Kounis syndrome has a good prognosis, with appropriate treatment, most patients recovered completely [10].

Conclusion

Kounis syndrome induced by Traditional Chinese medicine in a patient vaccinated with COVID-19 vaccine should be great concern.

References

1. Kounis NG, Zavras GM. Histamine-induced coronary artery spasm: the concept of allergic angina. Br J Clin Pract. 1991;45(2):121-8.
2. Wang X, Wang M, Wei J. Lu Gua, Shuang Tai, Induce a case of Kounis syndrome. Tianjin Med. 2018;46(9):999-1001.
3. Bing Ma, Tong Li. Research Progress of Toxic and Side Effects in Chinese Xiong Huang and it's compound preparation. Chinese J Tradition Chinese Med. 2013;31(8):1623-5.
4. Kounis NG, Koniari I, Soufras GD, Patsouras N, Hahalis G. Kounis syndrome: A review article on epidemiology, diagnostic findings, management and complications of allergic acute coronary syndrome. Int J Cadiol. 2017;232:1-4.
5. Fisher MM. Clinical observations on the pathophysiology and treatment of anaphylactic casdiovascular collapse. Anaesth Intensive Care. 1986;14:17-21.
6. Schummer W, Schummer C, Wippermann J, Fuchs J. Anaphylactic shock: Is vasopressin the drug of choice? Anesthesiology. 2004;101:1015-27.
7. Fritsche PJ, Helbling A, Weber BKB. Vaccine hyperseusitivity-update and overview. Swiss Med 2010;140:238-46.
8. Dai J, Madeeva D, Hayes V, Ahn HN, Tutwiler V, Arepally GM, et al. Dynamic intercellular redistribution of HIT antigen modulates heparin induced thrombocytopenia. Blood. 2018;132:727-73.
9. Hawe A, Flipe V, Jiskoot W. Fluorescent molecular rotors as dyes to characterize polysorbate containing IgG formulations. Pharm Res. 2010;17:314-32.
10. Fassio F, Losappio L, Amerigo DA, Peveri S, Pala G, Preziosi D, et al. Kounis syndrome: a concise review with focus on management. Eur J Intern Med. 2016;30:7-10.