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Delayed-Onset Type 1 Kounis Syndrome Caused Ventricular Fibrillation: A Case Report

CASE REPORT

INTRODUCTION

Kounis syndrome (KS) is an acute coronary syndrome (ACS) triggered by an allergic reaction that can be precipitated by food, drugs, or environmental factors.[1] Severe stress reactions triggered by allergies can be a cause of ACS.[2] Ventricular fibrillation is a life-threatening arrhythmia for ACS patients.[3] This article reports a case of intake of levofloxacin leading to type 1 Kounis syndrome and triggering ventricular fibrillation, which was successfully treated in our hospital.

CASE REPORT

The patient is a 59-year-old female, admitted to the hospital for "paroxysmal chest pain for 1 day." She was previously healthy, denying hypertension, diabetes, hyperlipidemia, chronic kidney disease, and coronary heart disease. The patient was treated with levofloxacin tablets for a urinary tract infection 2 days ago and then developed itching on the chest and limbs, accompanied by scattered urticaria, and began to have recurrent chest burning pain 1 day ago, radiating to the pharynx, accompanied by slight sweating, each time lasting about 2-3 minutes, which can be relieved spontaneously. The outpatient clinic admitted her to the department of cardiology with "unstable angina."

Physical examination: blood pressure 114/80 mm Hg, Pulse 63 beats/min, Respiratory rate 18 breaths/min, body temperature 36.2°C; scattered urticaria on the limbs and trunk. Breath sounds are clear in both lungs. The heart rate is 63 beats/min, the rhythm is uniform, and no pathological murmur is heard. The abdominal examination is normal. There is no edema in limbs.

Blood tests: Blood analysis, liver and kidney function, electrolytes, coagulation function, Creatine kinase isoenzyme MB (CK-MB), Troponin I (TNI), and N-terminal pro-brain natriuretic peptide (NT-proBNP) were normal. Echocardiography showed a left ventricular ejection fraction (LVEF) of 56%; mild tricuspid regurgitation and decreased left ventricular diastolic dysfunction. Admission ECG: sinus rhythm, normal ECG.

Diagnosis: 1. Coronary heart disease, unstable angina; 2. Urticaria.

Treatment: After admission, aspirin 300 mg, clopidogrel bisulfate 300 mg, atorvastatin 20 mg, loratadine 10 mg orally; half an hour after admission, the patient suddenly felt chest pain and then lost consciousness with twitching. ECG monitoring showed ventricular fibrillation (Figure 1), immediately shocked with 200 Joules; the patient regained consciousness. ECG showed sinus rhythm, ST segment arch dorsal upward elevation in V1-V6, ST-segment depression in leads II, III and aVF (Figure 2), nitroglycerin 0.5 mg sublingually relieved chest pain after about 5 minutes; repeat ECG showed ST segment in leads V1-V6 resolution (Figure 3). Emergency coronary angiography showed that the left main trunk, the left anterior descending artery, left circumflex branch, and right coronary artery had no obvious stenosis and obstruction, and thrombolysis in myocardial infarction risk score (TIMI) blood flow grade 3 (Figure 4).

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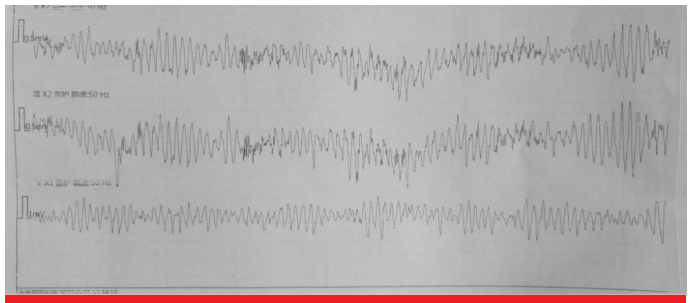

Figure 1. ECG monitoring shows ventricular fibrillation.

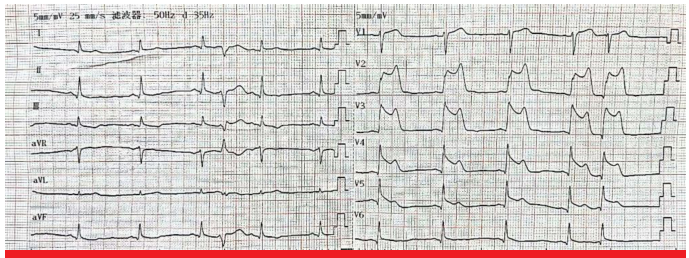

Figure 2. ST-segment arch dorsally ascending elevation in V1-V6.

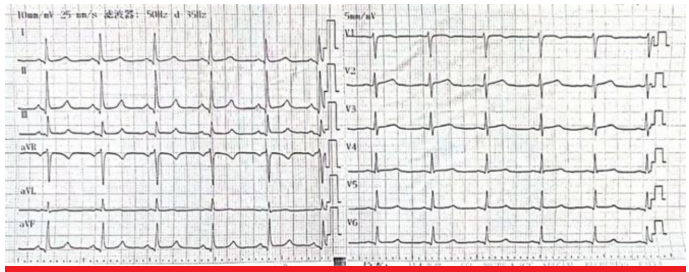

Figure 3. ECG showed ST segment in leads V1-V6 regressed.

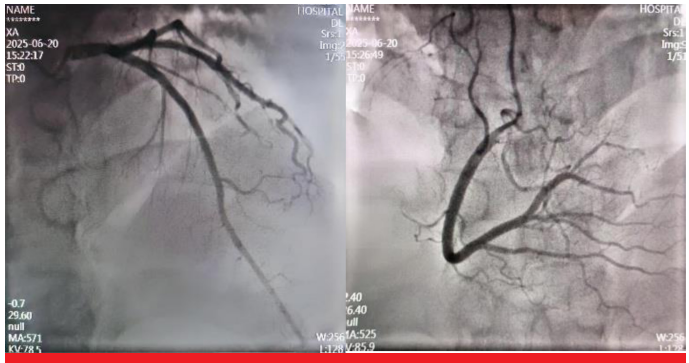

Figure 4. Coronary angiography shows no significant stenosis of the coronary vessels. (Left, left anterior descending artery and left circumflex branch, Right, right coronary artery).

Based on the patient's drug allergy history (urticaria), chest pain characteristics, dynamic ECG changes, and normal coronary angiography, delayed type 1 Kounis syndrome was diagnosed, likely triggered by drug allergy, leading to left anterior descending artery spasm (causing and angina). Cardiac enzymes remained normal. Loratadine 10 mg once daily was given for anti-allergy, diltiazem 30 mg every 8 hours for anti-coronary artery spasm. No recurrent chest pain or rash after 1 week. Discharged in stable condition.

DISCUSSION

Kounis syndrome is an anaphylactic-mediated acute coronary event that is relatively rare and can manifest as severe events such as angina, acute myocardial infarction, and even ventricular tachycardia and ventricular fibrillation.[4] Coronary artery spasm is a rare cause of acute myocardial infarction.[5] Various allergic reactions caused by different factors, such as medications and vaccines, can potentially trigger Kounis syndrome.[6] The mechanism is that the allergic reaction activates mast cells, macrophages, and T lymphocytes and releases a large number of inflammatory mediators that act directly on the coronary arteries, causing spasms, rupture, and thrombosis on the basis of vulnerable plaques.[7] According to the basic condition of the coronary artery and the characteristics of the lesion, KS can be divided into four types: [8] type 1 is the coronary artery spasm without underlying coronary artery lesion induced by allergic reaction; type 2 is an allergic reaction that induces coronary artery spasm or plaque rupture in the presence of atherosclerotic lesions; type 3 is coronary stent thrombosis due to anaphylaxis; coronary artery bypass graft thrombosis is defined as type 4.[9]

Levofloxacin is a commonly used fluoroquinolone antibiotic in clinical practice. Its allergic reactions are often characterized by rashes, papules, skin erythema, vascular prominence, toxic epidermal necrolysis, and other clinical symptoms; it can also lead to patients experiencing laryngeal edema, asthma, allergic pneumonia, and anaphylactic shock.[10] However, there are rare reports of it causing Kounis syndrome. García Núñez et al[11] report a 35-year-old man with sinusitis who had experienced an episode of the type 1 variant of Kounis syndrome after levofloxacin intake. However, the patient did not trigger ventricular fibrillation.[11] No similar reports have been seen since then.

The characteristics of this case are summarized as follows: triggers are levofloxacin allergy (urticaria); cardiac manifestations were recurrent chest pain and ventricular fibrillation; ECG features were extensive anterior ST segment elevation and then regression; coronary angiography showed that no significant stenosis was found, which supported the diagnosis of type 1 KS. Anti-allergic treatment combined with strong antispasmodics effectively controlled symptoms and arrhythmia; the interval between allergic symptoms (urticaria) and severe cardiac events (ventricular fibrillation) is about 1 day, which is in line with the characteristics of "late-onset type."

CONCLUSION

This case report describes a rare case of recurrent coronary artery spasm and ventricular fibrillation triggered by levofloxacin intake. The enlightenment of this case is that patients with chest pain after allergic reactions, especially those with ECG abnormalities, should be highly alert to the possibility of Kounis syndrome; allergies in the elderly,

underlying atherosclerosis, or chronic disease should be particularly vigilant about the risk of KS.[12]

Informed Consent: The written informed consent was acquired from the patient.

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Declaration of Interests: The authors have no conflicts of interest to declare.

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