Allergic angina (Kounis syndrome) following a multivitamin injection

SUDHINDER MURALI, SAVITHA MANAVALAN, SUDHA VIDYASAGAR, BAKUL RAJ

ABSTRACT

Kounis syndrome (KS), also known as allergic angina, is a type-1 hypersensitivity reaction affecting the coronary vessels, leading to vasospasm. It manifests like an acute coronary syndrome on the electrocardiogram and is often underdiagnosed. Foods (such as peanuts and fish) and medications (mostly antibiotics and analgesics) are the common triggers. We report a 30-year-old patient who developed KS following a multivitamin injection.

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INTRODUCTION

Multivitamins are widely used and various oral and parenteral multivitamin preparations are available over-the-counter. Anaphylactoid reactions to multivitamin injections are rare and thought to be triggered by the colouring agents and preservatives used in them.[1] We describe a patient who developed Kounis syndrome (KS) following a multivitamin injection, which manifested as a transient ST-segment elevation on the electro-cardiogram (ECG).

THE CASE

A 30-year-old woman with no known co-morbid conditions or previous history of allergies presented to the day care centre to receive a multivitamin injection, which was prescribed by her physician in view of chronic fatigue. Her vital signs were normal and intravenous (i.v.) infusion was started. Ten minutes following the commencement of the infusion, she developed chest tightness, palpitations, and breathing difficulty. The physician was informed about a possible allergic reaction and the infusion was immediately stopped. On examination, the patient was conscious and alert but appeared tachypnoeic. There were no signs of urticaria or angioedema.

Her pulse rate was 180 beats per minute (bpm), blood pressure was 80/60 mmHg, oxygen saturation of 98% on room air, and a body temperature of 100 °F. Cardiac auscultation showed a gallop rhythm. Lungs were clear on auscultation.

On suspicion of an anaphylactic shock, she was given 0.5 mg adrenaline intramuscularly along with antihistamines and i.v. hydrocortisone. The repeat blood pressure after 5 minutes was also low, and she was given a second dose of adrenaline, following which her blood pressure improved to 110/70 mmHg. The patient was shifted to the intensive care unit (ICU) for observation.

The patient had a persistent tachycardia of 150–180 bpm, and the ECG showed ST-segment elevation of 3 mm in the inferior leads (Fig. 1). Troponin-I was positive (0.98 ng/ml). Type 1 KS was suspected in view of the history, examination and ECG findings. As she did not have any risk factors or previous history of coronary artery disease, she was kept under observation in the ICU and was started on antihistamines and steroids. Repeat ECG taken after 30 minutes showed complete resolution of the previous changes (Fig. 2). Repeat troponin-I after 6 hours was negative. The echocardiogram showed a normal study. Blood investigations showed normal eosinophil counts, creatinine, and liver enzymes.

In view of her young age and absence of any risk factors, coronary angiogram was not performed. She was discharged the next day and was followed up in the outpatient department after 3 days when she was completely asymptomatic.

DISCUSSION

KS is classified into three types based on the status of the underlying coronary vessels. Type 1 KS occurs in individuals with normal underlying coronary arteries and no predisposing risk factors for coronary disease. Type 2 variant occurs in patients with inactive pre-existing atheromatous disease, in whom the allergic insult leads to plaque erosion or rupture, leading to acute myocardial infarction or coronary vasospasm. Type 3 variant includes coronary artery stent thrombosis secondary to an allergic reaction.[2]

Allergy to multivitamins, and one that manifests as KS, is rare.[3] Multivitamins contain substances such as dyes, preservatives, sweeteners, and supplementary ingredients such

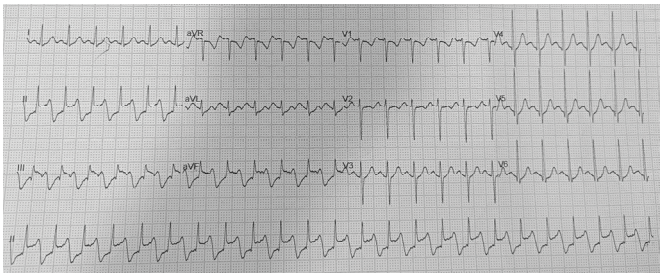

FIG 1. First electrocardiogram showing ST elevation in the inferior leads

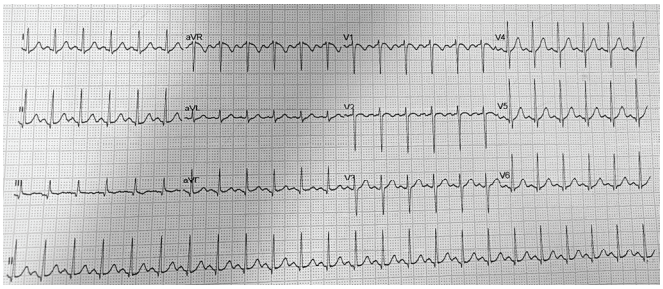

FIG 2. Repeat electrocardiogram taken after 30 minutes, showing resolved changes

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as benzyl alcohol, which are potential allergens. The pharmaceutical industry uses various inorganic and organic dyes to increase the aesthetic appearance of medications. These are pigments of natural origin or synthetic compounds. Dyes of synthetic origin, which are water-soluble, stable during drug processing, and cheaper, are widely used. A similar case report of Type-1 KS following a multivitamin injection in a 26-year-old woman was reported from Turkey, and the patient was managed conservatively using epinephrine and steroids.[4] In our patient, the multivitamin had benzyl alcohol as a preservative, to which anaphylaxis has been reported in the literature.[5]

KS was described in 1991 by Kounis and Zavras. It is not rare but underdiagnosed and often misdiagnosed, leading to inappropriate treatment.[6] Helbling *et al.* reported an incidence of 7.9–9.6 per 100 000 population for anaphylaxis with circulatory symptoms every year, and the case-fatality rate was 0.0001%.[7] It is estimated that the incidence of this syndrome among all patients with allergies was 19 per 100 000. Of 793 patients with allergies, 21 patients developed KS. Chest pain was reported in more than 70% patients and ST-elevation was seen in 40%.[8]

These studies show that not all patients with anaphylaxis develop KS, and the diagnosis is based on symptoms and ECG findings. In our patient, ST-elevation in the inferior leads was present along with sinus tachycardia. Although ST changes can be seen in severe hypotension, our patient also had ST-elevation even after her blood pressure became normal.

Recent reports have shown that KS has been observed in every race, age group (from 9 to 90 years old), and geographic location. The most commonly affected age is 40–70 years old (68%). Risk factors of KS include a history of previous allergy, hypertension, smoking, diabetes, and hyperlipidaemia. The number of causes that have been implicated to induce KS is increasing rapidly; of the various identified triggers, the most common triggers were antibiotics (27.4%) and insect bites (23.4%).[9]

Management includes treating anaphylaxis with epinephrine. Beta-blockers can worsen coronary spasms due to their action on alpha-adrenergic receptors. Type 1 variant can be treated with epinephrine, corticosteroids, and antihistamines alone. A detailed work-up, including a 12-lead ECG, echo-cardiography, and cardiac risk factor assessment, is required following relief of the acute episode. Type 2 and type 3 variants necessitate a coronary angiogram to rule out obstruction and will require dual antiplatelet therapy. Patients with allergic symptoms after stent implantation may benefit from antihistamines and corticosteroids. If the above measures fail, stent removal would be the only option.[9]

Conclusion

KS is often underdiagnosed and can potentially be fatal. It should not be misdiagnosed as an acute coronary syndrome and should be kept as a differential diagnosis if suggestive ECG changes are present. Any drug, including multivitamins, can be a possible allergen and should not be overlooked during diagnosis.

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Conflicts of interest. None declared

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