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Cardiac complications in a metamizole-induced type I Kounis syndrome

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Abstract Kounis syndrome is defined as the coincidental occurrence of allergic reaction and acute coronary syndrome secondary to vasospasm. Anti-inflammatory drugs are included as one of the multiple causes. Current data available about this syndrome come from case reports. We present the case of a patient who suffered Kounis syndrome with cardiogenic shock and asystole after intravenous infusion of Metamizole, and in which no lesions were observed in coronariography.

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Complicações cardíacas em síndrome de Kounis tipo I induzida por metamizol

Resumo A síndrome de Kounis é definida como a ocorrência concomitante de reação alérgica e síndrome coronariana aguda secundária ao vasoespasm. Os medicamentos anti-inflamatórios estão incluídos como uma das múltiplas causas. Os dados atuais disponíveis sobre essa síndrome são provenientes de relatos de casos. Apresentamos o caso de um paciente que apresentou síndrome de Kounis com choque cardiogênico e assistolia após infusão intravenosa de metamizol, e no qual não foram observadas lesões na coronariografia.

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Introduction

The association between coronary event and acute allergic reaction was first described in 1950 in a case report

of a patient with an allergic reaction to penicillin.¹ Subsequently, in 1996, Kounis syndrome was defined as the coincidental appearance of allergic reaction and acute coronary syndrome secondary to vasospasm.^{2,3} Two variants have been described: type I, occurring in patients with normal coronary arteries, and type II, occurring in patients with coronary artery atheromatous disease shown angiographically, in which the allergic reaction can erode and

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provoke atheromatous plaque rupture in addition to the vasospasm.^{4,5} Several conditions have been reported as capable of inducing Kounis syndrome; drugs, food, mosquito bite, environmental exposures.⁴ The mechanism why these allergens produce coronary vasospasm is through mast cell degranulation and ultimately the release of vasoactive mediators (histamine, leukotrienes, serotonin) and proteases (tryptase, kinase).³

In this report, the patient suffered coronary syndrome due to vasospasm with cardiogenic shock and asystole after intravenous metamizole infusion.

Case report

We describe a case of a 66-year-old man with unknown drug allergies and a medical background of dyslipemia and chronic bronchitis. Radical prostatectomy, several endoscopic polypectomies, and adenocarcinoma rectosigmoid anterior resection formed his surgical background. He was operated on liver bipartition with right portal ligation and excision of two liver metastases in segments II and IV, under general anesthesia.

Toward the end of the surgery, during the abdominal wall closure and coinciding with 2 g. of metamizole intravenous administration, the patient presented ST segment elevation in monitored leads (II and V5), severe hypotension and bradycardia, along with the appearance of a trunk and neck skin rash. It was treated with 100 mg of ephedrine, 2 mg of atropine, 4 mg of adrenaline, 5 mg of dexchlorpheniramine, 100 mg of hydrocortisone, and fluid replacement.

At that moment, an ECG was made and showed complete atrioventricular block and ST elevation in leads II, III, aVF, V5 and V6. The patient was moved to the hemodynamic unit as soon as the abdominal wall closure was finished. During the patient transfer, hemodynamic instability got worse and asystole occurred, so cardiopulmonary resuscitation was initiated and more adrenaline administered. Within a few minutes, change from asystole to ventricular fibrillation was noticed on the monitor screen and two electric shocks were administered after which sinus rhythm was recovered. Cardiac catheterization was performed and right dominance and an absence of coronary lesions were revealed in the coronariography.

The patient was later transferred to the intensive care unit where an elevation of cardiac enzymes (peak troponin I of 1.26 mg/mL) and serum tryptase levels were showed with subsequent decline of both values. An echocardiogram was performed in which completely normal contractility was showed. During his stay in the ICU, vasopressor drugs treatment was gradually decreased and finally withdrawn. ST elevation returned to baseline and cardiac enzymes and tryptase restored to normal values in the first 24 h. Extubation was performed on the third day and the patient was discharged from the unit and transferred to the General Surgery ward due to his satisfactory progress.

Discussion

The relation between anaphylaxis and coronary symptoms has been well documented on numerous occasions since publication of the first case in 1950. Despite this, Kounis

syndrome continues being an underdiagnosed entity^{3,6} that should be considered in the differential diagnosis of cardiogenic shock.⁶ Also, it would be useful to optimize its diagnosis to rule out the allergic reaction as a possible cause in all patients who come to the emergency services with chest pain and ST elevation in the electrocardiogram.⁷

Current data concerning etiology, clinic, diagnosis and therapeutic possibilities, come from nearly 300 cases published in the literature.⁵ In terms of etiology, the agents that could cause a Kounis syndrome are numerous. Within drugs, beta-lactams, NSAIDs, and iodinated contrast have been described as the most frequently agents involved in its appearance.^{3,6} In this report, even though the patient had already received other different analgesics during surgical operation, the coincidence of suggestive signs of coronary vasospasm and anaphylactic reaction occurred during the intravenous administration of metamizole, so this drug was considered the allergen that caused the clinical presentation.

Mast cell degranulation with vasoactive mediators release is the pathophysiologic mechanism of this syndrome, which is mainly diagnosed by clinical manifestations, and in which cardiac manifestations and electrocardiographic findings are very varied. Unstable angina, with or without data of vasospasm and acute myocardial infarction are the most common forms described for coronary event within Kounis syndrome.^{3,8} The presentation as cardiogenic shock is extremely infrequent,⁶ and only two reports have been previously published.^{6,9}

There are no specific clinical practice guidelines for the Kounis syndrome treatment.^{3,6} The current recommended treatment is the combined therapy of acute coronary syndrome and anaphylaxis,³ taking into account that some drugs used to treat coronary syndrome may aggravate anaphylactic reaction and vice versa.

In summary, we present a case in which intravenous metamizole acted as allergen, triggering an acute allergic reaction accompanied by coronary syndrome, with an absence of lesions in coronary arteries. This is defined as Kounis syndrome type I. The particular feature of this report is that the patient presented cardiogenic shock and asystole as cardiac manifestations, both being highly unusual in these situations.

Conflicts of interest

The authors declare no conflicts of interest.

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