



# Cardiac arrest caused by nafamostat mesilate: Kounis syndrome in the dialysis room?

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## To the Editor:

Nafamostat is a broad spectrum serine protease inhibitor with anticoagulant properties that is used during hemodialysis to prevent the proteolysis of fibrinogen into fibrin without increasing the risk of major bleeding, in patients prone to bleeding. In the very interesting report published in this *Journal* [1] concerning a 65-year-old man with diabetic neuropathy who was subjected to buttock abscess operation and developed, twice within 5 days, anaphylactic cardiac collapse with bilateral eye congestion, dyspnea, facial swelling and cardiac arrest during hemodialysis immediately after taking nafamostat besilate for bleeding prevention. Successful resuscitation was applied with epinephrine, dexamethasone, and pheniramin. Cardiac enzymes were normal, eosinophils were increased during the second episode, total immunoglobulin E (IgE)s were increased and skin prick test with nafamostat was weakly positive. Details of electrocardiographic changes and cardiac troponins were not given. The dialyzer apparatus used was the Polyflux 14L (Gambro, Lund, Sweden). This report raises important questions on etiology, pathophysiology and prevention of anaphylaxis during hemodialysis.

This patient undoubtedly developed an anaphylactic

cardiac collapse but the exact cause was not clearly elucidated. The skin prick test was weak, and specific IgE testing was not available. All 5 components of Polyflux 14L apparatus have been incriminated to induce allergic reactions [2]. Polyflux membrane is a mixture of polyarylethersulfone, polyvinylpyrrolidone and polyamide, and each of them could act as sensitizer. The apparatus potting material made from polyurethane, housing caps made from polycarbonate, protective plugs made from polypropylene and o-ring made from silicon rubber can induce, although rarely, allergic reactions. Polyurethane chemicals are produced by the reaction of isocyanates and they may cause allergic contact dermatitis or precipitate asthma attacks. Polycarbonate can induced allergic reactions especially in dental procedures. Polypropylene has induce irritant contact dermatitis and silicon rubber has induced hypersensitivity reactions known as “latex-fruit syndrome” [3].

Kounis hypersensitivity-associated acute coronary spasm leading to cardiac arrest is possible in this case report [1], although high sensitivity cardiac troponins and electrocardiographic changes were not given. Such spasm is transient, often lasts a few seconds, and is unpredictable. Electrocardiogram might be normal and only ambulatory electrocardiographic monitoring is extremely helpful to detect the spasm. This syndrome is induced during allergic reactions by activated high and low affinity IgE receptors FC $\gamma$ RI, FC $\gamma$ RII, FC $\epsilon$ RI and FC $\epsilon$ RII situated on both mast cell and platelet surface [4]. Nephrologists and physicians in dialysis room should be aware of the possibility of Kounis syndrome when patients are exposed to allergens [5].

Received September 29, 2016; Accepted October 5, 2016

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## Conflicts of interest

All authors have no conflicts of interest to declare.

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