

Takotsubo cardiomyopathy due to cephalosporin anaphylaxis under general anaesthesia

Sir,

Cephalosporin anaphylaxis is a known but rare entity with an incidence of 0.0001-0.1%^[1] We report an unusual case of anaphylaxis during general anaesthesia which resulted in transient stress-induced cardiomyopathy in the absence of coronary disease.

A 27-year-old female was posted for limb-salvage surgery for osteosarcoma of the left proximal tibia. She had received three cycles of chemotherapy containing Adriamycin. She was active pre-operatively and did not have any comorbidity. All her laboratory investigations were normal including echocardiography which showed an ejection fraction of 62%.

On arrival in the operation theatre, she was provided general anaesthesia with standard monitoring. After an intravenous dose of injection cefuroxime, the patient developed bradycardia followed by multifocal ventricular extrasystoles and ventricular tachycardia. The arrhythmia resolved spontaneously but the patient became haemodynamically unstable. All anaesthetic agents were discontinued and 100% oxygen was administered. Patient's radial artery was catheterized and arterial blood gas analysis was done. The patient was administered injection hydrocortisone and an infusion of noradrenaline was started. Trans-oesophageal echocardiography showed global left ventricular hypokinesia, dyskinesia and regional wall abnormality beyond the territory of the single epicardial vessel with an ejection fraction of 35%. Cardiac enzymes (creatin kinase-MB and TROP-T) were mildly raised. She was shifted to Intensive Care Unit for monitoring and further management. A 12 lead electrocardiogram (ECG) showed diffuse ST segment elevation in leads I, II, aVL and V3-V 6. She was extubated the following day and follow-up echocardiography on the 3rd post-operative day showed an ejection fraction of 45% with improved left ventricular contractility. She was posted for incision and drainage of pus 6 weeks later but this time, she had an uneventful perioperative period. A skin prick test performed during pre-anaesthetic

check-up was positive for cefuroxime and negative for other drugs, including atracurium, propofol and midazolam. Echocardiography showed an ejection fraction of 60%.

The temporal relationship between drug administration and cardiovascular collapse and positive results in the skin prick test in the present case suggest that cefuroxime, a second-generation cephalosporin, was the most likely cause of the reaction. The negative results of pre-operative intradermal tests can be explained by the lower sensitivity of the tests. We did not obtain serum tryptase levels as it is not routinely done in our hospital. Serial mast cell tryptase^[2] levels as early as feasible may be useful for diagnosis. During anaphylaxis, compensatory release of catecholamines by renin-angiotensin system and histamine results in excessive activation of catecholamine receptors in the left ventricle; catecholamine-induced transient left ventricular dysfunction is known as takotsubo cardiomyopathy.^[3-5] Our patient fulfilled all the criteria (Mayo clinic) of takotsubo cardiomyopathy, which are; left ventricular hypokinesia, dyskinesia extending beyond a single epicardial distribution; absence of chronic obstructive pulmonary disease and coronary disease; new ECG changes with elevated cardiac enzymes and absence of pheochromocytoma and myocarditis.

Kurisu *et al.*^[6] suggested multivessel coronary spasm at microscopic level as a cause of cardiomyopathy. Lymphodepletion and profound suppression and alteration of antigen-specific IgG antibody response by the chemotherapeutic agents and the pre-operative dexamethasone were possibly the factors due to which our patient did not have any other respiratory and cutaneous manifestation of anaphylaxis. Treatment of stress-induced cardiomyopathy relies on standard supportive measures. The prognosis is generally favourable, provided the patient survives the initial complications.

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Conflicts of interest

There are no conflicts of interest.

Soumi Pathak, Mamta Dubey, Nitesh Goel

Department of Anaesthesia, Rajiv Gandhi Cancer Institute and Research Centre, New Delhi, India

Address for correspondence:

Dr. Soumi Pathak,
Rajiv Gandhi Cancer Institute and Research Centre, Sector 5, Rohini,
New Delhi, India.
E-mail: pathaksoumi@gmail.com

Nishioka K, *et al.* Tako-tsubo-like left ventricular dysfunction with ST-segment elevation: A novel cardiac syndrome mimicking acute myocardial infarction. *Am Heart J* 2002;143:448-55.

REFERENCES

1. Suk EH, Kim DH, Kweon TD, Na SW, Shin JA. Stress-induced cardiomyopathy following cephalosporin-induced anaphylactic shock during general anesthesia. *Can J Anaesth* 2009;56:432-6.
2. Girotra V, Lalkhen A. Anaphylaxis. *Anaesth Intensive Care Med* 2014;15:15-9.
3. Shimizu M, Kagawa A, Takano T, Masai H, Miwa Y. Neurogenic stunned myocardium associated with status epilepticus and postictal catecholamine surge. *Intern Med* 2008;47:269-73.
4. Powers FM, Pifarre R, Thomas JX Jr. Ventricular dysfunction in norepinephrine-induced cardiomyopathy. *Circ Shock* 1994;43:122-9.
5. Kurowski V, Kaiser A, von Hof K, Killermann DP, Mayer B, Hartmann F, *et al.* Apical and midventricular transient left ventricular dysfunction syndrome (tako-tsubo cardiomyopathy): Frequency, mechanisms, and prognosis. *Chest* 2007;132:809-16.
6. Kurisu S, Sato H, Kawagoe T, Ishihara M, Shimatani Y,

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