Allergology International 68 (2019) 544–545

Contents lists available at ScienceDirect

Allergology International

journal homepage: http://www.elsevier.com/locate/alit

Letter to the Editor

Premedication for cold induced urticaria in a patient undergoing cold cardioplegia

Dear Editor,

A 67-year-old patient with rheumatic heart valve disease and arrhythmias was admitted to our hospital to undergo a cardiac surgery. The patient had 20 years' history of cold urticaria therefore he was referred to an allergist before operation.

The patient had been experiencing hives induced by bathing in a lake, cold wet air and exposure to cold surfaces. No systemic reaction had occurred previously and he had been using various antihistamines on demand. The ice cube test was positive. Skin provocation test to determine critical temperature thresholds was done using TempTest® (EMO systems GmbH, Berlin, Germany).

TempTest® is an instrument with a Peltier element generating a temperature gradient along its length. If the skin provocation test is positive, the temperature to induce wheals can be measured in ±1 °C accuracy from 4 °C to 44 °C. Though there is no direct evidence that the level of temperature to induce hives is associated with higher risk of systemic reaction, there is a correlation between temperature threshold and disease severity and activity as well as the efficacy of the treatment.[1] In our case the test showed that temperature from 4 °C to +26 °C induced hives.

One third of patients with cold urticaria experience anaphylactic reactions. There is not much data on the risk factors for systemic reactions in cold urticaria, but it could be related not only to the temperature, but also to the surface area of skin exposed and the duration of the exposure.[2] There are a few cases of cooling of the patient with cold urticaria described in the literature.[3–9] Since the cardiac surgery procedure required cold cardioplegia and the outcomes of systemic exposure to the cold is unknown and the risk of systemic reaction could not be outruled, premedication was prescribed. We adapted the scheme used by Lancey *et al.*[3] replacing intravenous Ranitidine by intravenous Famotidine (Table 1).

After 5 days of preoperative premedication the patient was retested using TempTest® which showed that the threshold to induce hives was lower (from 4 °C to +18 °C). The operation of aortic and mitral valve replacement and coronary artery bypass grafting was performed successfully using +34 °C antegrade and retrograde blood cardioplegia. The operating room temperature was 21–23 °C. No complications related to cold urticaria occurred during intraoperative or postoperative period.

After six months the patient was evaluated by the allergist again. He still had symptoms of cold urticaria after contact with cold surfaces and cold water. TempTest® revealed that temperature from 4 °C to +25 °C induced skin hives. The reduced threshold effect of the treatment was temporary. Recently omalizumab has been shown to be effective and safe in the treatment of cold urticaria in randomized placebo – controlled trials.[10] Currently this drug is only indicated for chronic spontaneous urticaria, but in the future it could be a treatment option for our patient as well.

There we present the first case of premedication for a cold urticaria patient to undergo cooling procedure with quantitative evaluation of the temperature level.

Table 1
Premedication used in a patient with cold induced urticaria before planned cold cardioplegia.

	Medication	Dosage	Route	Duration or timing
Long term preoperative	Fexofenadine	180 (mg) once daily	Oral	5 days
	Ranitidine	150 (mg) twice daily		
Preoperative	Methylprednisolone	60 (mg)	Intravenous	12 h, 6 h and 1 h before operation
	Famotidine	20 (mg)		
	Diphenhydramine	75 (mg)		
Intraoperative	Methylprednisolone	2 (g)	Intravenous	1 h before cardiopulmonary bypass
	Methylprednisolone	60 (mg)	Intravenous	1 h before rewarming
	Famotidine	20 (mg)		
	Diphenhydramine	75 (mg)		
Postoperative	Methylprednisolone	60 (mg)	Intravenous	6 h after operation
	Famotidine	20 (mg)		
	Diphenhydramine	75 (mg)		

Nota bene: the doses of methylprednisolone used were very high. If considering using such premedication scheme each patient should be evaluated for concomitant diseases and possible side effects.

Peer review under responsibility of Japanese Society of Allergology.

https://doi.org/10.1016/j.alit.2019.05.003

Conflict of interest

The authors have no conflict of interest to declare.

Ruta Vebriene *, Laura Malinauskiene, Audra Blaziene, Anzelika Chomiciene

Institute of Clinical Medicine, Clinic of Chest Diseases, Immunology and Allergology, Vilnius University Faculty of Medicine, Vilnius, Lithuania

* Corresponding author. Institute of Clinical Medicine, Clinic of Chest Diseases, Immunology and Allergology, Vilnius University Faculty of Medicine, Santariskiu 2, Vilnius LT-08661, Lithuania.
E-mail address: ruta.vebriene@santa.lt (R. Vebriene).

References

1. Młynek A, Magerl M, Siebenhaar F, Weller K, Vieira Dos Santos R, Zuberbier T, et al. Results and relevance of critical temperature threshold testing in patients with acquired cold urticaria. *Br J Dermatol* 2010;**162**:198–200.
2. Alangari AA, Twarog FJ, Shih MC, Schneider LC. Clinical features and anaphylaxis in children with cold urticaria. *Pediatrics* 2004;**113**:313–7.
3. Lancey RA, Schaefer OP, McCormick MJ. Coronary artery bypass grafting and aortic valve replacement with cold cardioplegia in a patient with cold-induced urticaria. *Ann Allergy Asthma Immunol* 2004;**92**:273–5.
4. Irani C, Gordon ND, Levinson AI. Normothermic cardioplegia in a patient with cold-induced urticaria. *J Allergy Clin Immunol* 2007;**120**:722–3.
5. Bakay C, Onan B, Onan IS, Ozkara A. Coronary artery bypass grafting in cold-induced urticaria. *Ann Thorac Surg* 2010;**89**:949–51.
6. Booth K, Parissis H. Management of cold-induced urticaria during cardiac surgery. *J Card Surg* 2011;**26**:158–9.
7. Ellis AK, Saha T, Arellano R, Zajac A, Payne DM. Successful management of cold-induced urticaria during hypothermic circulatory arrest. *Ann Thorac Surg* 2013;**96**:1860–2.
8. Fitzsimons MG, Vlahakes G, Makar R, Dilley J, Wright C, Van Cott EM, et al. Deep hypothermic circulatory arrest in a patient with cold-induced urticaria. *Ann Thorac Surg* 2015;**100**:722–3.
9. Maddy EM, Schmoker JD, Tharp WG, Bender SP, Anderson EP, Martin JA. Deep hypothermic circulatory arrest in a patient with cold-induced urticaria. *J Cardiothorac Vasc Anesth* 2017;**31**:1795–8.
10. Metz M, Schütz A, Weller K, Gorczyza M, Zimmer S, Staubach P, et al. Omalizumab is effective in cold urticaria-results of a randomized placebo-controlled trial. *J Allergy Clin Immunol* 2017;**140**:864–7.

Received 9 January 2019
Received in revised form 6 May 2019
Accepted 12 May 2019
Available online 27 June 2019