

Cold panniculitis: Adverse cutaneous effect of whole-body cryotherapy



Elizabeth Greenwald, BA, Mitalee Christman, MD, Lauren Penn, MD,
Nooshin Brinster, MD, and Tracey N. Liebman, MD
New York, New York

Key words: adverse cutaneous effect; cold panniculitis; whole-body cryotherapy.

INTRODUCTION

Whole-body cryotherapy (WBC) involves exposure to extremely cold air (below -110°C) in an enclosed space for several minutes. It has been increasingly used in recent years as a treatment for muscle soreness after exercise, with many claiming it also has widespread cosmetic benefits.¹ However WBC does not have US Food and Drug Administration approval.² In addition, a 2015 Cochrane review determined there is insufficient evidence to support the claims of its benefits or safety.¹ Here we report a case of cold panniculitis that occurred after exposure to WBC.

CASE REPORT

A 47-year-old man with a medical history of hearing loss and autoimmune neutropenia presented for the evaluation of a diffuse papular eruption. Over the preceding 2 weeks, he received 8 WBC treatments in a cold chamber after exercise. During treatments, his face, hands, and feet were covered and he stood with his arms at his sides, thus also sparing the axillae from exposure. The eruption started on the lower extremities and proceeded to involve the trunk and upper extremities over the following days. He had occasional mild pruritus and mild tenderness of the abdominal lesions. The patient had no systemic symptoms associated with the skin eruption.

Physical examination found numerous erythematous, edematous pink papules, some coalescing into plaques, on the trunk, arms, and legs. The face, feet, hands, and axillae were spared (Figs 1 and 2).

A punch biopsy found a superficial and deep perivascular mixed-cell infiltrate of lymphocytes, histiocytes, and neutrophils. The inflammatory

Abbreviation used:

WBC: whole-body cryotherapy

infiltrate was most dense at the junction of the reticular dermis and subcutaneous fat and extended into fat lobules, where there was focal fat necrosis (Fig 3).

A diagnosis of cold panniculitis was made based on clinical presentation and histology. The patient's condition improved spontaneously without treatment within several weeks after discontinuation of WBC.

DISCUSSION

WBC involves exposure to extremely cold dry air (below -110°C) in a specialized chamber or room, for 2 to 4 minutes.¹ It has been increasingly used within local gyms and athletic training facilities as a treatment for muscle soreness after exercise. However, a 2015 Cochrane review determined there is insufficient evidence to support improvement in self-reported muscle soreness or subjective recovery after exercise in physically active young men, with no evidence on its use in women or elite athletes. The review further highlighted the lack of evidence regarding its safety.¹ The US Food and Drug Administration has not cleared or approved any WBC devices.²

Several adverse events related to WBC have been reported, including the death of an employee at a cryotherapy center, who was reportedly using the chamber outside of business hours and was subsequently found dead in the chamber the next day.³ Case reports of adverse events after whole body

From the Ronald O. Perelman Department of Dermatology, New York University School of Medicine.

Funding sources: None.

Conflicts of interest: None disclosed.

Correspondence to: Tracey Liebman, MD, 240 East 38th Street, 11th Floor, New York, NY 10016. E-mail: Tracey.Liebman@nyumc.org.

JAAD Case Reports 2018;4:344-5.

2352-5126

© 2018 by the American Academy of Dermatology, Inc. Published by Elsevier, Inc. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

<https://doi.org/10.1016/j.jidcr.2018.02.010>



Fig 1. Clinical image of patient at initial presentation after exposure to WBC. Numerous erythematous, edematous pink papules and plaques are visible on the trunk, with a discrete cut-off at the border of the axillary vault. The axillae are spared.



Fig 2. Clinical image of patient at initial presentation after exposure to WBC. Erythematous, edematous papules and plaques are seen on patient's right flank.

cryotherapy sessions, including transient global amnesia⁴ and abdominal aortic dissection,⁵ are also documented.

The patient we present had diffuse erythematous, edematous pink papules with sparing of nonexposed areas after multiple WBC treatments. His presentation was most consistent with cold panniculitis—inflammation of the subcutaneous fat caused by cold exposure, commonly presenting as indurated erythematous papules, plaques, or nodules.

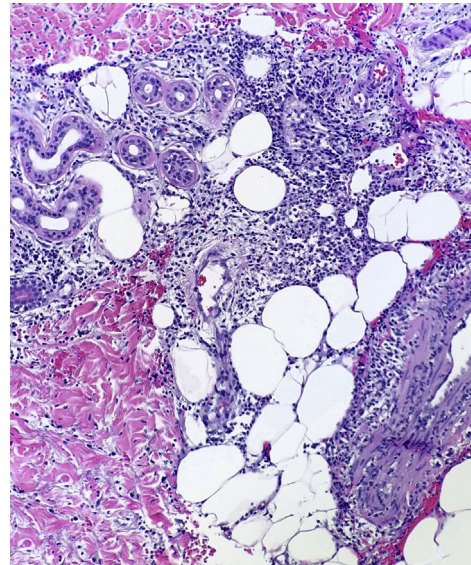


Fig 3. Histologic image. There is a lymphohistiocytic infiltrate with neutrophils in the reticular dermis and superficial fat (Hematoxylin-eosin stain; original magnification: ×20.)

The erythematous lesions typically become purpuric and less indurated over time. Residual hyperpigmentation may be seen for several months.⁶

Cold panniculitis is a self-limiting disorder, usually resolving in 2 to 3 weeks. No treatment is required beyond cessation of cold exposure and symptomatic relief.⁶ As WBC centers continue to proliferate, with many centers claiming widespread health benefits, it is important to be vigilant about potential adverse effects.

REFERENCES

1. Costello JT, Baker PRA, Minett GM, Bieuzen F, Stewart IB, Bleakley C. Whole-body cryotherapy (extreme cold air exposure) for preventing and treating muscle soreness after exercise in adults. *Cochrane Database Syst Rev.* 2015;(9):CD010789.
2. *Whole Body Cryotherapy (WBC): A "Cool" Trend that Lacks Evidence, Poses Risks.* U.S. Food and Drug Administration; 2016. Available at: <https://www.fda.gov/ForConsumers/ConsumerUpdates/ucm508739.htm>. Accessed December 22, 2017.
3. McGee K, Turkewitz J. Death of Woman in Tank at a Nevada Cryotherapy Center Raises Questions About Safety. *New York Times.* 2017. Available at: <https://www.nytimes.com/2015/10/27/us/death-of-woman-in-tank-at-a-nevada-cryotherapy-center-raises-questions-about-safety.html>. Accessed December 22, 2017.
4. Carrard J, Lambert AC, Genné D. Transient global amnesia following a whole-body cryotherapy session. *BMJ Case Rep.* 2017. <https://doi.org/10.1136/bcr-2017-221431>.
5. Cámara-Lemarroy CR, Azpiri-López JR, Vázquez-Díaz LA, Galarza-Delgado DA. Abdominal aortic dissection and cold-intolerance after whole-body cryotherapy: a case report. *Clin J Sport Med.* 2017;27(5):e67-e68.
6. Quesada-Cortés A, Campos-Muñoz L, Díaz-Díaz RM, Casado-Jiménez M. Cold panniculitis. *Dermatol Clin.* 2008; 26(4):485-489.