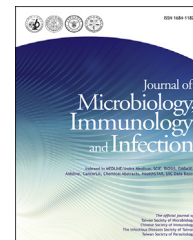


Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.e-jmii.com

CORRESPONDENCE

Starch dust explosion and flame burn injury in a patient complicated with severe cellulites caused by non-O1 *Vibrio cholerae*



Dear Editor,

Invasive nonepidemic *Vibrio cholerae* (NEVC) infections after burns injury are rare.¹ We read with great interest the article in the *Journal of Microbiology, Immunology and Infection* by Chen et al,² reporting that a neutropenic immunocompromised patient who denied a history of participating in water activities and suffered from urinary tract infection caused by *V. cholerae* nonserogroup O1. Here, we report a burn injury patient participating color party in a dried swimming pool (fresh water) in June 2015. Unfortunately he suffered from starch dust explosion and a burn wound of left upper arm infected with *V. cholerae* Non O1 (Figure 1). The severe cellulites caused by this unusual pathogen were successfully treated with ciprofloxacin therapy.

On the night of June 28, 2015, a tragic fire accident occurred in Formosa Water Park situated near Tan-Shui River and the coastal areas in the northern Taiwan. More than 500 young people were injured with various degrees of thermal burn in the starch dust explosion. A 19-year-old male patient was admitted to Taipei municipal Wan-Fang Hospital for second to third degree burns of the extremities involving 30% of the total body surface area. The patient was admitted to the burn unit immediately and managed under stringent infection control measures. Empirical antibiotic therapy with cefazolin 1 g intravenously (IV) q. 6 hours and gentamicin 80 mg IV q. 8 hours was administered. On the 4th admission day, the skin and soft tissue revealed swelling, redness, discoloration, and pus collection on the left arm (Figure 1). The patient received surgical debridement and culture work up. Pus and tissue culture of the burn wound both isolated *V. cholerae* non-O1 by laboratory tests. Antibiotic testing of the isolate showed that it was susceptible to ampicillin, chloramphenicol, sulfamethoxazole/trimethoprim, and ciprofloxacin, but resistant to cefazolin and gentamicin. Because the patient

had fever, leukocytosis, and severe cellulites, the antibiotic was shifted to ciprofloxacin 400 mg IV q. 12 h for salvage therapy with a complete 14-day course. The patient's condition stabilized and he was discharged with arrangement for further rehabilitation on August 18, 2015.

V. cholerae is a Gram-negative, single flagellated, motile bacillus. Serologic identification was done based on capsular O antigen. *V. cholerae* serologic type O1 and O139 are known as epidemic strains and cause epidemic cholera. However, non-O1 *V. cholerae* (NEVC) species could cause invasive severe infections, including enterocolitis, septicemia, urinary tract infection, necrotizing fasciitis, and liver abscess.^{1–6} In Taiwan, the investigators reported that NEVC species can cause invasive clinical syndrome similar to *Vibrio vulnificus*.^{4,6} Mortality of primary septicemia in



Figure 1. The patient's left upper arm and forearm shows redness, swelling, local heat, and bullae formation after the burn injury.

<http://dx.doi.org/10.1016/j.jmii.2015.09.004>

1684-1182/Copyright © 2015, Taiwan Society of Microbiology. Published by Elsevier Taiwan LLC. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

NEVC in risk patients can be as high as 47%.⁴ However, there are only three reports of invasive NEVC infections after burns injury in the literature.¹ Exposure to contaminated water (either fresh water or marine environment) were noted in the three reported cases. In our patient, contamination of the burn wound by Tan-Shui river water near the coastal areas might be the pathogenesis of entry. Infections with invasive *Vibrio* species bacteria (*V. vulnificus*, NEVC, etc.) should be considered in those patients with a compatible clinical syndrome, high inoculum exposure (via a contaminated water or food source), and such burn victims.

Conflicts of interest

All authors have no conflicts of interest to declare.

References

1. Magnusson MR, Pegg SP. *Vibrio cholerae* non-O1 primary septicaemia following a large thermal burn. *Burns* 1996;22:44–7.
2. Chen YT, Tang HJ, Chao CM. Urinary tract infection due to Non O1 *Vibrio cholerae*. *J Microbiol Immunol Infect* 2016;49:305–6.
3. Morris Jr JG, Black RE. Cholera and other vibrioses in the United States. *N Engl J Med* 1985;312:343–50.
4. Ko WC, Chuang YC, Huang GC, Hsu SY. Infections due to non-O1 *Vibrio cholerae* in southern Taiwan: predominance in cirrhotic patients. *Clin Infect Dis* 1998;27:774–80.
5. Hsu WC, Yu WL, Guo SE. Antibiotic salvage therapy for necrotizing fasciitis of left lower leg caused by *Vibrio vulnificus*: a case report. *J Microbiol Immunol Infect* 2015;48:S184.
6. Lai CC, Liu WL, Chiu YH, Chao CM, Gau SJ, Hsueh PR. Liver abscess due to Non O1 *Vibrio cholerae* in a cirrhotic patient with hepatocellular carcinoma. *J Infect* 2011;62:235–7.

Tai-Chin Hsieh
Shio-Shin Jean
Tsong-Yi Ou
Fu-Lun Chen
Wen-Sen Lee*

Division of Infectious Disease, Department of Internal
Medicine, Wan Fang Medical Center, Taipei Medical
University, Taipei, Taiwan

Department of Internal Medicine, School of Medicine,
College of Medicine, Taipei Medical University, Taipei,
Taiwan

*Corresponding author. Division of Infectious Disease,
Department of Internal Medicine, Wan Fang Medical Center,
Taipei Medical University, 111 Section 3, Hsin Long Road,
Taipei, Taiwan.

E-mail address: 89425@wanfang.gov.tw (W.-S. Lee)

31 August 2015
Available online 19 November 2015