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LETTER TO THE EDITOR

Skin and soft tissue infection caused by *Aeromonas* species in cancer patients

To the Editor,

We read with great interest the article by Papadakis et al,[1] published in the *Journal of Microbiology, Immunology,* and *Infection*, who reported a patient with fulminate *Aeromonas hydrophila* soft tissue infection and septicemia during acute lymphoblastic leukemia treatment. After combination therapy with antibiotics and surgical management, the patient recovered well. The case reminds us of the possibility of *Aeromonas* infection in cancer patients; however, knowledge about this clinical entity is limited. This study was intended to investigate retrospectively the clinical manifestation of *Aeromonas*-related skin and soft tissue infections (SSTIs) in cancer patients to understand this issue better.

This study was conducted at the Chi Mei Medical Center, a 900-bed hospital. This hospital is located in southern Taiwan,[2] where the *Aeromonas* infection is endemic, and most of the patients treated at the hospital are cancer patients. This retrospective study enrolled patients with culture-confirmed *Aeromonas* infection during the period January 2009—December 2011. SSTIs were diagnosed in patients who presented with pain, swelling of the involved site, and patchy, edematous, erythematous, or bullous skin lesions. Necrotizing fasciitis was defined as necrosis of the subcutaneous tissue and adjacent fascia due to severe infection. All isolates were identified by conventional methods and verified further following the procedure described in our previous study.[3] Polymicrobial infections were diagnosed in patients from whom *Aeromonas* species, in addition to other pathogens, were isolated from cutaneous specimens. In-hospital mortality was defined as death due to any cause during hospitalization.

A total of 129 patients with SSTIs caused by *Aeromonas* species were enrolled in the study, including 12 patients (9.3%) with underlying malignancy. Clinical manifestations of these 12 cancer patients with *Aeromonas* SSTIs are summarized in Table 1. Most of the patients were male ($n = 9$, 75%), with two-thirds of them being elderly patients (aged greater than 65 years). *A. hydrophila* ($n = 6$, 50.0%) was the most common pathogen, followed by *Aeromonas veronii* biovar *sobria* ($n = 3$, 25.0%), *Aeromonas caviae* ($n = 2$, 16.7%), and *Aeromonas veronii* biovar *veronii* ($n = 1$, 8.3%). Hepatocellular carcinoma was the most common malignancy, followed by cholangiocarcinoma, and gastric cancer. In addition to cancer, diabetes mellitus ($n = 3$) and liver cirrhosis ($n = 3$) were the most common underlying diseases. Among these patients, 58.3% ($n = 7$) had trauma-related wound infections, and only one patient had a history of exposure to aqueous environments prior to infection. Only two patients presented with necrotizing fasciitis. The majority ($n = 10$, 83.3%) of patients had polymicrobial SSTIs. The outcome was favorable with an appropriate antibiotic therapy with *in vitro* activity, with or without surgical intervention, except in one patient with *A. caviae* infection who had in-hospital mortality.

In the present work, we had two important findings. Firstly, although liver cirrhosis and diabetes mellitus are the most common underlying diseases, which predispose patients to *Aeromonas* infections,[4,5] the present work and Papadakis et al's[1] report show that *Aeromonas* can cause SSTIs in patients with malignancy, including both solid and hematological cancers. Secondly, consistent with our previous study,[3] most of the cases were caused by polymicrobial infections. Despite these patients being immunocompromised, the outcomes combined with this infection were good in this series.

In conclusion, *Aeromonas* species should be considered as an etiology of SSTIs among cancer patients.

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Table 1 Clinical manifestations of 12 cancer patients with skin and soft tissue infections caused by *Aeromonas* species

Patient no. (year)	Age/sex	Underlying conditions	*Aeromonas* species	Trauma	Polymicrobial infection	Antibiotic	Surgical treatment	Amputation	ICU admission	Acute respiratory failure	In-hospital mortality
1 (2009)	79/M	Gastric cancer, receiving chemotherapy	*A. veronii* biovar *sobria*	No	Yes	Ceftazidime	Yes	No	Yes	Yes	No
2 (2009)	47/M	Esophageal cancer, receiving chemotherapy	*A. hydrophila*	No	Yes	Ceftazidime	No	No	No	No	No
3 (2009)	64/M	Cholangiocarcinoma, DM, receiving chemotherapy	*A. caviae*	No	Yes	Ciprofloxacin	No	No	Yes	Yes	Yes
4 (2010)	86/F	Liver cirrhosis, HCC	*A. veronii* biovar *sobria*	Yes	No	Ceftriaxone	No	No	No	No	No
5 (2010)	77/M	Gastric cancer	*A. hydrophila*	Yes	No	Ciprofloxacin	Yes	No	No	No	No
6 (2010)	71/F	DM, tongue cancer	*A. hydrophila*	Yes	Yes	Ciprofloxacin	Yes	No	No	No	No
7 (2010)	77/M	Ureteral cancer	*A. veronii* biovar *veronii*	Yes	Yes	Ciprofloxacin	Yes	No	No	No	No
8 (2010)	89/M	Lip cancer, receiving chemotherapy	*A. caviae*	No	Yes	Ceftriaxone	No	No	No	No	No
9 (2011)	81/M	Rectal cancer	*A. hydrophila*	Yes	Yes	Ceftazidime	Yes	No	Yes	No	No
10 (2011)	63/M	Cholangiocarcinoma	*A. veronii* biovar *sobria*	No	Yes	Ceftazidime	No	No	Yes	Yes	No
11 (2011)	75/F	DM, liver cirrhosis, HCC	*A. hydrophila*	Yes	Yes	Ciprofloxacin	Yes	No	Yes	Yes	No
12 (2011)	61/M	Liver cirrhosis, HCC	*A. hydrophila*	Yes	Yes	Ceftazidime	Yes	No	No	No	No

DM = diabetes mellitus; F = female; HCC = hepatocellular carcinoma; ICU = intensive care unit; M = male.

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