



ORIGINAL ARTICLE

# *Stenotrophomonas maltophilia* bloodstream infection: Comparison between community-onset and hospital-acquired infections



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## KEYWORDS

Bacteremia;  
Bloodstream  
infection;

**Background/Purpose:** *Stenotrophomonas maltophilia* has been recognized as an important nosocomial pathogen, but few reports have discussed *S. maltophilia* infection in the community settings. This study aimed to reveal characteristics of patients with community-onset *S. maltophilia* bloodstream infection (SMBSI), to specify the subgroup of healthcare-

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associated (HCA) infection in the community-onset group and to compare them with hospital-acquired (HA) SMBSI patients.

**Materials and methods:** Medical charts of adult patients with SMBSI presenting to a medical center in southern Taiwan from May 2008 to October 2011 were reviewed and analyzed retrospectively.

**Results:** Among 153 patients, we observed a high percentage (38.6%) of SMBSI to be community onset. Among community-onset SMBSI, 45.8% were community-acquired (CA) and 54.2% were HCA. The crude mortality rates were 11.1%, 18.8%, and 60.6% in the CA, HCA, and HA groups, respectively. Structural/mechanical abnormalities were observed in 32.7% of all cases, and 60% of those were related to malignancy. Independent risk factors for mortality in community-onset SMBSI were liver cirrhosis, liver metastasis, and a high Pitt bacteremia score, whereas structural/mechanical abnormalities and a high Pitt bacteremia score related to increased mortality in HA SMBSI.

**Conclusion:** Community-onset *S. maltophilia* infection deserves attention. Patients with community-onset SMBSI have reduced disease severity and lower mortality rate when compared to HA SMBSI. Underlying structural/mechanical abnormalities, especially those caused by malignancies, are common in SMBSI cases and should be investigated when bacteremia occurs.

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## Introduction

*Stenotrophomonas maltophilia*, formerly named *Pseudomonas* and then *Xanthomonas maltophilia*, is a ubiquitous aerobic nonfermentative Gram-negative bacillus that exists in humid environments, water sources, soil, and plants.<sup>1</sup> Because of its limited pathogenicity and multidrug resistance, *S. maltophilia* is considered to be an opportunistic pathogen and an important nosocomial pathogen. Reports of it causing community-acquired (CA) infection are uncommon.<sup>2</sup> Risk factors for *S. maltophilia* infection include underlying malignancy, presence of indwelling devices, chronic respiratory diseases, immunocompromised status, prior use of antibiotics, and long-term stay in the hospital or intensive care unit (ICU).<sup>1</sup> Characteristics of community-onset *S. maltophilia* infection and its importance have not been clearly described. One recent review article focusing on CA *S. maltophilia* infections concluded that *S. maltophilia* infections are not restricted to hospitalized patients.<sup>2</sup> Case reports and series gave a glimpse into the various manifestations of *S. maltophilia* infections in community settings, including meningitis, endocarditis, wound and soft-tissue infection, bacteremia, sinusitis, osteochondritis, chronic enteritis, and other conditions.<sup>2</sup> However, to our knowledge, no study has offered a comprehensive perspective on community-onset *S. maltophilia* infections. This retrospective study aimed to elucidate the patient demographics and clinical features of community-onset *S. maltophilia* bloodstream infection (SMBSI). In addition, we used clear definitions of CA, healthcare-associated (HCA), and hospital-acquired (HA) infections, and compared the differences and risk factors for mortality between these specific patient groups.

## Materials and methods

### Settings and study design

This retrospective study was conducted in a 1700-bed tertiary hospital in southern Taiwan from May 2008 to

October 2011. The study population enrolled adult patients, aged  $\geq 18$  years, with *S. maltophilia* bacteremia. Medical charts were reviewed and all data were recorded under the approval of the hospital's Institutional Review Board. Only the clinical characteristics of the first episode of bacteremia were analyzed for each patient.

### Definitions

Bloodstream infection is defined as the isolation of bacteria from one or more peripheral venous blood samples collected from a patient associated with the symptoms and signs relevant to systemic infection. The probable source (including respiratory, urinary, gastrointestinal, skin and soft tissue, bone, and joint) was determined by microbiological results and physicians' clinical interpretations according to Centers for Disease Control (CDC) definitions.<sup>3</sup> Catheter-related bloodstream infections were defined according to the management guidelines of the Infectious Diseases Society of America, if there was no apparent source for the bacteremia except the central venous catheter (CVC) and when the organism was isolated in a positive semiquantitative culture ( $>15$  CFU) from the CVC tip with a positive peripheral blood culture for the same organism.<sup>4</sup> Hospital-acquired bloodstream infection (HABSI) was defined by a positive blood culture obtained from patients who were hospitalized for  $>48$  hours. Community-onset bloodstream infection (COBSI) was defined by a positive blood culture obtained from patients who were either not hospitalized or hospitalized for  $\leq 48$  hours.

The community-onset group was further divided into HCA and CA subgroups. The relationship among the three subgroups is presented in Fig. 1. COBSI was defined by a positive blood culture drawn within 48 hours after hospitalization for patients who did not attend any healthcare facilities in 90 days or reside in nursing home.<sup>5-7</sup> Episodes were considered HCA according to the definition of Friedman et al,<sup>5</sup> if the patient fulfilled any of the following criteria: (1) received intravenous therapy at home, received

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