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The changing microbiological and antimicrobial susceptibility profile of cerebrospinal fluid organism isolates in a teaching hospital, Tangerang, Indonesia

Abstract

Background: Central nervous system (CNS) infections have become serious problems that contribute to morbidity and mortality in developing countries. In the recent years, antimicrobial resistance has arisen parallel with the changing trend of infectious pathogens, which resulted in the unavailability of an ideal antimicrobial agent. This study was designed to evaluate the central nervous system pathogens and their susceptibility profile using routine microbiological data.

Methods: The data of CSF culture and susceptibility testing were collected from January 2010 to August 2015. The majority of positive samples (68/9; 68.7%) had history of neurosurgical procedures. All CSF clinical samples were immediately inoculated onto Columbia blood agar base® (Difco™) with sheep blood agar (5%) and chocolate agar. CHROMagar (BBL-Difco™) and Sabouraud dextrose agar were also used for isolation and presumptive identification of yeast and filamentous fungi. Identification and antimicrobial susceptibility testing of all isolates were performed by an automated method from VITEX-2 Compact® (Biomérieux, France) in accordance with Clinical and Laboratory Standard Institute (CLSI) guideline

Results: The most common pathogens isolated were coagulase negative staphylococci (CoNS) 39/99 (39.4%), followed by Acinetobacter baumanii 10/99 (10.1%), Pseudomonas aeruginosa 7/99 (7.1%), Sphingomonas paucimobilis 5/99 (5.0%), and Aeromonas salmonicida 4/99 (4.0%). Almost of all Gram positive cocci were susceptible to
Introduction

CNS infections are life-threatening and significant causes of morbidity and mortality, especially in developing countries [1,2]. Bacterial infections have been known as the most common cause of the CNS infections, meanwhile fungi and mycobacteria are also frequently reported [3]. The pattern of pathogens recovered from CSF culture varies from Gram-positive cocci to multidrug-resistant Gram-negative bacteria depending on geographic region, age, co-morbidities, type of neurosurgical procedures, and site of infection [1,4,5].

Neurosurgical site of infections after a neurosurgical procedure remains an important issue with overall infection rate of 0.4 % to 7.7% [3,6,7]. Studies have shown the main organisms that cause postneurosurgical infection were non-lactose fermenting gram-negative bacteria (GNB) followed by A. baumanii, K.pneumoniae, methicillin-resistant Staphylococcus aureus (MRSA), and Candida species [5,7,8].

The burden of health care associated infection in hospitals are frequently increased due to the excessive use of broad-spectrum antibiotics and because health professionals are caring less to safety precautions [8]. The development of many drug-resistant organisms, such as carbapenem-resistant and methicillin/oxacillin-resistant strains, and extended-spectrum beta-lactamase (ESBL) producing bacteria may reflect the changing trend of pathogens and their antimicrobial susceptibility pattern [9,10]. Therefore, microbiological surveillance is important to identify the common pathogens and their antimicrobial susceptibility patterns in order to select the rational empirical antimicrobial therapy based on regional and national data to reduce the emergence of resistant organisms [8,11,12].

Materials and methods

We conducted a retrospective, descriptive study using the routine microbiological data from Siloam General Hospital database. This health center is...