Clinical and Cerebrospinal Fluid Abnormalities as Diagnostic Tools of Tuberculous Meningitis

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Abstract

Background: Tuberculous meningitis (TBM) is the most severe form of extrapulmonary tuberculous (TB) disease and remains difficult to diagnose. The aim of the study was to determine the diagnostic value of clinical and laboratory findings of cerebrospinal fluid (CSF) examinations for diagnosing TBM using bacterial culture result as the gold standard.
Methods: A prospective cross sectional study was carried out to 121 medical records of hospitalized TBM patients in neurological ward at Dr. Hasan Sadikin General Hospital Bandung, from 1 January 2009–31 May 2013. The inclusion criteria were medical records consisted of clinical manisfestations and laboratory findings. The clinical manisfestations were headache and nuchal rigidity, whereas the laboratory findings were CSF chemical analysis (protein, glucose, and cells) and CSF microbiological culture. Validity such as sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV) for clinical and laboratory findings were calculated, using bacterial culture result as the gold standard.
Results: The most clinical findings of TBM was nuchal rigidity and it had the highest sensitivity value, but the lowest spesificity value. Decreased of CSF glucose had the highest sensitivity value compared to other laboratory findings, but the value was low.
Conclusions: The clinical manisfestations and the laboratory findings are not sensitive and specific enough for diagnosing TBM. [AMJ.2016;3(1):132–6]

Keywords: Cerebrospinal fluid, clinical manisfestations, diagnostic tools, laboratory findings, tuberculous meningitis

Introduction

Tuberculous (TB) is one of the major health problems in the world, especially in developing countries.[1,2] Manifestations of TB can be pulmonary and or extrapulmonary, which 20.4% cases are extra-pulmonary TB.[3,4] Based on data from Centers for Disease Control and Prevention (CDC) in 2011, it was indicated that 5.7% extrapulmonary TB involved the Central Nervous System (CNS).[4,5] The most severe manifestation of CNS TB is Tuberculous Meningitis (TBM) which causes high mortality in children and adult.[5-8] The mortality rate of TBM in Bandung, the capital city of West Java, Indonesia, is 50% in the first week of admission to the hospital and increases to 67% after one month treatment in the hospital.[9] Early diagnosis and accurate treatment are promptly needed in order to improve the outcomes.[8,10,11]

Standardized diagnostic criteria for TBM have not been established, because the clinical manifestations of TBM are not specific, especially in the early stages of disease.[12] Patients usually come to the hospital after having headache, fever, nuchal rigidity, irritability, vomiting or even after having many neurologic symptoms and signs within a few days.[9,12] Many patients come with history of typical systemic symptoms of TB infection, such as cough, lethargy, weight loss, and night sweating that might be suggestive of TB, but also non-specific.[12] Lumbar puncture is the first procedure to be conducted for patients who are suspected with CNS infections. Routine analysis of cerebrospinal fluid (CSF)

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