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Technical Note & Surgical Technique

Characteristics and surgical outcomes of tuberculous meningitis and of tuberculous spondylitis in pediatric patients at Dr. Hasan Sadikin Hospital, Bandung: A single center experience

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ABSTRACT

Introduction: Tuberculous meningitis (TBM) and tuberculous spondylitis (TBS) are the form of extra-pulmonary tuberculosis.
Material and method: A retrospective cohort study was conducted among children with TBM (2009–2014) and TBS (2004–2014) who were treated in our center; Department of Child Health, Department Neurosurgery and Department Orthopedics.
Results: Of 123 children diagnosed with TBM (53) and TBS (70); based on modified British Medical Research Council: Stage I (3 cases), Stage IIa (3 cases), Stage IIb (23 cases), Stage III (24 cases). TBM developed hydrocephalus: 36 cases performed ventriculoperitoneal shunt and 17 cases external ventricular drainage. In TBM: 9.4% (5/53) had vegetative state and mortality rate was 20.8% (11/53). TBM Hospital discharge correlated with Glasgow coma scale preoperation ($p < 0.001$). In TBS: Thoracic spine was involved in 67.1% cases, Lumbar in 28.6% and Cervical in 4.3%. Of 70 cases: 45 cases with neurological deficit and 25 cases without one. Of 24 cases underwent spine surgery: 6 cases performed anterior decompression spinal fusion and 18 cases performed posterior debridement with stabilization. In TBS patients, mortality rate was 1.4% (1/70).
Conclusions: The surgical outcomes of both TBM and TBS still poor in many ways. Improving TB outcomes as implementation of the End TB Strategy program at 2030 remain our homework.

1. Introduction

Tuberculosis (TB) is an infectious disease caused by the Mycobacterium TB, typically affect the lung (pulmonary TB) but can affect other sites as well (extra-pulmonary TB). Among the manifestations of extra-pulmonary TB are lymphadenitis, TB meningitis (TBM) and spondylitis (TBS). In 2014, TB killed 1.5 million people, which include 140.000 children; as Indonesian population in 2014 are 254 million, the mortality rate caused by TB are 41/100.000 population thus among 322.806 new cases and relapses: 23.170 (7%) cases aged under 15 years old (pediatric) [1]. TBM is a serious neurological disease with significant morbidity and mortality [2]. Children with Stage I TBM are likely to lead a normal life, whereas those with Stage III have a high risk of mortality [3]. The TBM Stage based on modified British Medical Research Council (MRC) that added Glasgow coma scale (GCS) in its scoring as follows: i) **Stage I** – GCS 15 with no focal neurologic deficit, ii) **Stage IIa** – GCS 15 with focal neurologic deficit, iii) **Stage IIb** – GCS 11–14 with or without focal neurologic deficit, iv) **Stage III** – GCS < 11 with or without focal neurologic deficit [4]. Hydrocephalus, a common complication of TBM, can occur either early or late in the clinical course, as well as either before or after commencement of anti-TB drugs [5]. Pediatric TBM patients with hydrocephalus, decerebrate rigidity have a higher mortality rate and more severe sequelae [6]. Although shunting is recommended [7], surgical relief of hydrocephalus may not alter the neurological status or long-term outcome.

TBS accounts for almost 50% cases of skeletal TB [8], resulting in bone destruction, spinal deformity and neural complications [9,10]. The diagnosis of disease is based on clinical and radiological findings [11]. The treatments of TBS are aimed to eradicate the infection and to

Abbreviations: TB, tuberculosis; TBM, tuberculous meningitis; TBS, tuberculous spondylitis; RSHS, Dr. Hasan Sadikin Hospital; MRC, Medical Research Council; GCS, Glasgow comma scale; ADSF, anterior decompression spinal fusion; DOTS, directly observed treatment short; Vp shunt, ventriculoperitoneal shunt; EVD, external ventricular drainage; TLSO, thoracolumbosacral orthosis; CSF, cerebrospinal fluid; WHO, World Health Organization

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