Investigation of Post-Neurosurgical Nosocomial Bacterial Meningitis Outbreak at King Chulalongkorn Memorial Hospital

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**Background:** Bacterial meningitis is an uncommon complication after neurosurgery, but is associated with significant mortality and morbidity. In July 2011, 11 patients were reported to have post-neurosurgical nosocomial meningitis. It was thought that there was an outbreak of bacterial meningitis in Neurosurgery Department, King Chulalongkorn Memorial Hospital, Bangkok, Thailand.

**Methods:** To determine the true outbreak, causative agent of meningitis, and contributing factors, we reviewed the data from medical records of all 11 reported patients. A criteria for diagnosis of bacterial meningitis included clinical suspicion of meningitis (fever, neck stiffness, or reduced sensorium) plus cerebrospinal fluid (CSF) evidence of bacterial meningitis (positive bacterial culture, positive bacterial Gram stain, more than 5 white cells per μL with predominant neutrophils, or a ratio of CSF to blood glucose of less than 40%).

**Results:** To confirm whether there is an outbreak of bacterial meningitis in Neurosurgery Department in July 2011, the numbers of patients diagnosed with post-neurosurgical bacterial meningitis per month during the past 18 months were determined. The median and mean numbers of patients per month were 2 and 2.3, respectively, with the range from 0 to 5 patients per month. However, after a thorough review of all medical records, only six of 11 patients were confirmed to have bacterial meningitis according to our criteria. Of 6 patients, there were 2 males and 4 females with the median age of 64 ± 13.5 years. The mean white cell count was 1,891 cells/mm³ with the range of 150 and 6,000 cells/mm³, and the mean CSF glucose and protein concentration was 22.7 mg/dL and 210.5 mg/dL, respectively. Of 6 patients, only 1 patient with CSF culture growing *Acinetobacter baumannii*. Four patients were treated with ceftazidime, and 2 were treated with both ceftazidime and vancomycin. Overall clinical and microbiological response rates were 100%.

**Conclusions:** Even though there is no outbreak of post-neurosurgical nosocomial bacterial meningitis in Neurosurgery Department, the case frequency is relatively high in comparison with the past 18 months. We plan to make a surveillance of the number of meningitis patients during the next 3 months for early detection, identification of the contributing factors, and control of infection. In addition, we emphasized the strict bundled intervention to prevent surgical site infection to all healthcare workers including pre- and intra-operative preparation of patients and antibiotic prophylaxis for reduction of post-operative infections.