Nosocomial bacterial meningitis — prevention rather than cure!

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Madam, ventilator-associated pneumonia and urinary tract infections have been documented as nosocomial threats. However, nosocomial bacterial meningitis (NBM) is unique to neurology and neurosurgery patients with high mortality and morbidity rates.[1] This is attributable to head trauma, hospital-acquired bacteraemia complicated by metastatic infection, or invasive procedures like placement of external ventricular drains (EVDs) and ventriculoperitoneal shunts, craniotomies, intrathecal infusions etc.[2] NBM comprises a distinct patient group with specific bacterial pathogens including Pseudomonas aeruginosa, Staphylococcus aureus, Staphylococcus epidermidis, Streptococcus pneumoniae, Haemophilus influenzae and Acinetobacter species.[1,2]

Once NBM is suspected, aggressive empirical antimicrobial therapy is indicated along with catheter removal.[2] Thus, NBM further deteriorates the clinical status of an already critically ill patient, simultaneously increasing the burden of cost. Unfortunately, emergence of multi-drug resistant organisms greatly limits the treatment options and despite antimicrobial therapy, the prognosis is poor.[1,2]

According to New England Journal of Medicine recommendations, adoption of simple techniques before, during and after surgery can minimise the risk of postoperative meningitis. These include draping the surgical site with adhesive drapes to prevent implantable hardware from coming in contact with exposed skin, use of double layer of gloves when handling implantable devices, using percutaneous drains to collect postoperative haemorrhage after surgery etc.[2] Evidence suggests that antibiotic-impregnated catheters reduce the incidence of shunt infection. However, more well-designed clinical trials would confirm their net benefit.[3]

The avoidance of modifiable risk factors in the causation of NBM should be emphasised. These include the duration and frequency of catheterisation, intraventricular haemorrhage, and insertion techniques.[4] Acinetobacter is easily transmitted via direct contact with colonised patients, hands of hospital staff and respiratory droplets. Given the emergence of carbapenem-resistant species, infection-control measures need vigorous enforcement to prevent person-to-person spread as well as environmental cross-infection.[4] In Netherlands, a bundle approach (increased awareness, focused standard operating procedures, a diagnostic and therapeutic algorithm, timely administration of prophylaxis, and improvement of the drainage system) using a multidisciplinary team led to 40% reduction in incidence of drain-related secondary meningitis.[5]

The prevention and management of nosocomial bacterial meningitis poses a significant challenge, especially with the emergence of multidrug-resistant pathogens. Protocols need to be developed to standardise surgical techniques to minimise the risk of infection, and therefore clinical trials of simple interventions should be initiated.[2] Training of nurses and paramedical staff also becomes imperative. Hospitals need to strengthen their infection control programme. Small preventive measures can collectively bring about remarkable control of nosocomial morbidities, ensuring the finest and most cost-effective therapeutic care.

References

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