

## Evaluation of Postoperative meningitis in Neurosurgery

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**Abstract :Introduction :** The most dreaded cause of morbidity and mortality in Neurosurgery is meningitis. The reported incidence of postoperative meningitis is variable (0.5-8%)<sup>1-5</sup>.

**Materials and Methods :** The study includes all patients who underwent neurosurgery over a period of 4 years (2014 to 2017). Patients with culture positive meningitis were included for analysis.

**Results :** Of the 1080 patients, who underwent neurosurgical procedure during this study period, 32 patients developed infection. The overall incidence of meningitis was 3%. The incidence of meningitis was high (8%) in patients who had a pre-existing infection like post pyogenic meningitis or tubercular hydrocephalus. Non-lactose fermenting Gram negative bacillus followed by pseudomonas and klebsiella species are the most common organisms causing meningitis. The overall mortality in patients with meningitis was 5.5%.

**Conclusion :** Meningitis remains one of the most dreaded complications in Neurosurgical procedures. Gram negative organisms are the most common causative pathogen.

**Key words :** meningitis, neurosurgery, nosocomial infection, antibiotic prophylaxis.

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### I. Introduction

In neurosurgical patients, nosocomial infections are the most common cause of morbidity and mortality. Meningitis is the most dreaded infection and can lead to a number of variety of complications including death. The diagnosis requires a high degree of clinical suspicious and cerebrospinal fluid (CSF) examination. Postoperative meningitis is associated with increase in the hospital stay and also increase in total cost of illness. The reported incidence of postoperative meningitis is quite variable (0.5 to 8%).

### II. Materials and Methods :

In this retrospective study I included all patients who underwent various neurosurgical procedures in the department of Neurosurgery at Calcutta National Medical College, Kolkata over a period of 4 years (2014 – 2017). Case records, computerized log containing records of all the infections (culture reports) occurring in the Institute, Hospital Infection Control Department, Department of Neuromicrobiology were reviewed. CSF analysis was performed unless contraindicated, in all the patients with clinical features of meningism. The demographic characters, nature of surgery and the causative organism along with antibiotic profile were analysed. All patients scheduled for elective surgery are first examined for any condition that precludes surgery. This involves preoperative fitness clearance from anaesthetist. The night before surgery patients have had bath with shampoo. I usually start ceftriaxone sodium 1 gram iv 12 hourly and Amikacin 500 mg iv 12 hourly in adult patients in the morning on the day of surgery. I continued iv antibiotics for a period of 5 days.

### III. Results :

During the study period, 1080 patients were operated. There were total 30 patients developed infection. The overall incidence of meningitis in patients with cranical emergency surgery was 3%. Patients who had pre existing infection like post pyogenic meningitis or tubercular hydrocephalus had a higher incidence of meningitis (p<0.06). This was followed by surgeries for intracranial tumours and surgery for various kinds of trauma and shunt related surgery.

The most common organisms causing meningitis were non-fermentative Gram-negative bacteria (NFGNB) (28%) followed by Pseudomonas aeruginosa (15.6%) and Klebsiella species (13%). The overall mortality in patients with meningitis was 5.5%. This included all the patients who developed postoperative meningitis and expired, regardless of the final cause.

### IV. Discussion :

Prevention of infection is one of the most important aspect in Neurosurgery, where a highly sterile environment is of utmost importance. In addition to the mortality and morbidity, infections are associated with enormous economic burden to the patients and also to the hospital.

The importance and efficacy of antibiotic prophylaxis has been conclusively established in various studies<sup>6-8</sup>. Different centres have used different antibiotic regimens and the reported incidence of postoperative central nervous system infection (PCNSI) has varied from 0.5% to 7.1-5. In the study by McClelland et al<sup>3</sup>, the incidence of PCNSI was 0.8 and 0.4% in the spinal surgeries.

The most common organism was *Staphylococcus aureus* followed by *Propionibacterium acnes*. In the study by Blomstedt et al<sup>9</sup>, the incidence of infection was 7%. In my study the overall rate of meningitis was 3% with an overall mortality 5.5% which compares favourably with my studies<sup>1-5</sup>. The most common organism in my series was NFGNB followed by pseudomonas. This is in variance with other studies. In the study by Dashti et al<sup>1</sup>, the most common organism was *S. aureus* 36%, while in others the reported rate varies up to 50%<sup>1,10</sup>.

In a large multicentre prospective study Korinek et al<sup>11</sup> did not find the non-usage of antibiotic prophylaxis to be a risk factor for postoperative infection. In the study by Patir et al<sup>12</sup>. The risk factors for postoperative infection were altered sensorium, multiple operations, pre-existing infection, emergency surgery, duration of surgery more than four hours, CSF leak. My antibiotic protocol included ceftriaxone sodium and Amikacin and I have found it to be effective for the existing flora at my centre.

## V. Conclusion :

In this article I have reviewed my experience with postoperative meningitis. The use of affordable antibiotics depending on the prevalent of bacterial flora and their sensitivity pattern was recommended.

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