Nonfermenting Gram-negative Bacilli Meningitis in Neurosurgical Elderly Patients with Intraventricular Catheters

**BACKGROUND:**
Nonfermenting gram-negative bacilli (NFGNB) have emerged as important healthcare-associated pathogens. Its treatment is a serious therapeutic problem due to the emerging resistance. We describe the clinical features and the outcome of nosocomial neurosurgical meningitis in an elderly patients group.

**MATERIAL AND METHODS:**
- All patients older than 65 years with nosocomial postsurgical meningitis due to NGBN diagnosed at the Hospital Universitario Central de Asturias (Oviedo, Spain) between 1990 and 2015 were retrospectively reviewed.
- Nosocomial meningitis was defined according to the CDC definitions.
- Continuous values were expressed as mean and compared using Student t test or U of Man-Whitney. Categorical values were expressed as absolute and relative frequencies and were compared using Fisher's exact test or χ² test. A p value less than to 0.05 was considered as statistically significant. A binary logistic regression analysis using a step-wise (Wald) to determine the factors influencing the mortality of the infection was performed.

**RESULTS:**
- At least one NFGNB was isolated in 33 CSF (57.6% men, mean age of 69 [5] years).
- The mean time elapsed between the surgery and the onset of the infection was 30[27] days.
- The most frequent symptom was fever (100%) followed by altered mental status (27%). Eight patients had meningeal signs.
- Although all patients received empirical treatment, this treatment was adequate in 22 cases.

**UNDERLYING DISEASES:**
- Head trauma: 9%
- Hemorrhage: 51.5%
- Hydrocephaly: 6%
- Neoplasm: 33.3%

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<th>Pseudomonas aeruginosa</th>
<th>Acinetobacter baumannii</th>
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<td>51.5%</td>
<td>48.5%</td>
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**Treatment**

- N = 33
- Intravenous monotherapy
- Combined parenteral therapy
- Intravenous and intrathecal therapy

- Aminoglycosides + ceftazidime (1 case)
- Antipseudomonal cephalosporins (11 cases)
- Carbapenems (9 cases)
- Ampicillin-Sulbactam (1 case)
- Colistin intravenous and intrathecal (9 patients)

**RESULTS:**
- In 18 cases, treatment was associated with removal of the intraventricular catheter.
- Thirteen (39.4%) patients died as a direct consequence of the infection, seven of them were infected by Pseudomonas.
- Mortality was significantly high in absence of catheter removal (9 cases versus 4, p = 0.012, OR 3.040 [0.877-10.544]). None of the colistin-treated patients died (0 versus 13 p= 0.035 OR 0.519 [0.361-0.746].

**CONCLUSIONS:**
Nosocomial meningitis by nonfermenting gram-negative bacilli is an infection with high mortality in elderly patients without intrathecal therapy or treatment with colistin. The use of intravenous and intrathecal colistin is a safe option.