Prophylactic antibiotics with intracranial pressure monitors and external ventricular drains: a review of the evidence


Authors' objectives
To evaluate the role of prophylactic antibiotics (PABs) in preventing infections associated with intracranial pressure (ICP) monitors and external ventricular drains (EVD).

Searching
A review of articles in English in MEDLINE was performed for the period 1966-1996 using the following search terms: ventriculostomy, ICP monitors, prophylactic antibiotics, and infection. The reference lists of the articles selected were reviewed, as well as abstracts presented at the two main annual American neurosurgical meetings, the American Association of Neurological Surgeons (AANS), and the Congress of Neurological Surgeons (CNS) for the period 1985-1996.

Study selection
Study designs of evaluations included in the review
The following design criteria were used for inclusion: a prospective randomisation of patients, a blinding procedure and non-treated controls. Both studies that were included were randomised placebo-controlled trials.

Specific interventions included in the review
Trimethoprim-sulfamethoxazole prophylaxis with an average duration of monitoring of 24 hours in one study, and nafcillin prophylaxis with ventriculostomies which were in place for an average of 5.2 days in the other study. The control in both studies was placebo.

Participants included in the review
Patients undergoing EVD for normal-pressure hydrocephalus, and patients with intracerebral hemorrhage, tumours and trauma as indications for monitoring ICP

Outcomes assessed in the review
The number of cases of wound or intracranial infections.

How were decisions on the relevance of primary studies made?
Three investigators, who were blinded to the authors, institutions, journal, year of publication, the abstract, the results and the conclusion of the articles, reviewed the articles. Agreement among the investigators was 100%.

Assessment of study quality
The authors do not report the method used to assess quality, or how the quality assessment was performed.

Data extraction
The authors do not state how the data were extracted for the review, or how many of the authors performed the data extraction.

Methods of synthesis
How were the studies combined?
Studies were described in a narrative way due to the small number of studies found.

How were differences between studies investigated?
The authors do not state how differences between the studies were investigated.

**Results of the review**

Two studies, with 52 (25 patients in PAB-group and 27 in non-PAB group) and 95 patients respectively, were included.

Only two studies met the predetermined inclusion criteria, and they were of insufficient size to produce statistically significant results. In one study one infection was noted in each group (PAB and non-PAB group). In the other study antibiotics did not provide any statistically significant benefit. Thirty-six other studies were identified that did not meet the inclusion criteria for meta-analysis, but appeared to contain interesting comments about the role of PABs or infections associated with ICP monitors and EVDs. These studies are discussed.

**Authors' conclusions**

No consensus regarding the use of PABs with ICP monitors and EVDs is noted. Randomised controlled trials of sufficiently large size with appropriate blinding are needed to address this issue.

**CRD commentary**

The inclusion criteria are clear and well specified. The synthesis of results is presented in a narrative way which seems, given the limited evidence available, clear and appropriate. However the review suffers from a lack of methodological details. Only one electronic database was searched (MEDLINE), and the review was limited to English articles only so relevant publications may have been missed. There is no information on the quality of the studies included, nor on the way data was extracted from primary studies.

Considering the above factors, and the fact that the evidence was limited, the findings from this review should be interpreted with caution.

**Implications of the review for practice and research**

The authors state that a randomised, double-blind, multicentre, placebo controlled study with 500-700 patients could determine the precise role of PABs with these devices.

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