Cerebrospinal Fluid Research

Oral presentation

Comprehensive, economical management of cerebrospinal fluid shunt infections – a twenty-one year experience

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Background

We presented our management of all CSF shunt infections and their prevention in 2000 and 2007. This paper describes our experience with treatment of shunt infections with and without surgery.

Materials and methods

We describe analysis of data stored in two computer databases for 2,193 shunt related operations involving 786 patients. Infections were defined as positive cultures of the CSF or the shunt. Antibiotic levels in the CSF and Minimam Bacteriocidal (MBC) levels are expressed in ug/ml. Operative procedures were complete shunt removal, placement of an extra ventricular drain, antibiotics until the CSF was sterile, then replacement of the shunt ((CSR+EVD+abx+R), externalization of the distal limb, abx, then R (Ex+abx+R) and antibiotics alone. Analysis was by transfer to Excel files, Fisher Exact and Student t-tests. A cure was defined as 16 months without recurrent infection or a new infection with another organism.

Results

Six infections followed 65 operations not shunt related (9%), 17 after 131 complex shunt operations (13%), and 54 after 1024 revisions and 32 after 607 insertions (5% each) with only the rate after complex shunt operation significantly higher (X = 9.1, df = 1, P = 0.0025). Fifty-three patients experienced 55 infections and 67 trials of treatment for Coagulase Negative Staphylococcal (S CoN) infections (14 had 2 trials). Equivalent cure rates were recorded for treatment of S Co N infections without surgery (23/26 – 88%) and with CSR+EVD+abx+R (29/30 – 97%) P = 0.3; but both were more effective than Ex+abx+R (2/11 – 18%) P < 0.000. Of 14 infections due to other "treatable" organisms usually associated with meningitis, 9 without surgery (64%) and 5 with surgery were cured on the first trial. Shunt operations ranged from 48 to 204 per year and did not vary significantly (t = -1.9, df = 20, P = 0.29) The 123 types of organisms will be listed. The site of recovery of S CoN, presence of WBC in the CSF and the degree of S CoN susceptibility did not affect the cure rates. Hospital days in USA $ in 2006 = $106,433 with surgery and $43,560 without.

Conclusion

Medical treatment should be tried for 3 days with shunt infection in the presence of a functioning shunt until the organism and its sensitivity to levels of antibiotics that can be safely achieved in the CSF can be identified. SCoN and bacteria usually associated with meningitis are the only ones to deserve a medical trial.