Hydrogel coated catheter

The catheters with a hydrophilic surface may impede bacterial adherence and thereby reduce catheter-related cerebrospinal fluid infection.

see Bioglide.

Case series

2016

A retrospective study compared the occurrence of cerebrospinal fluid infection related to use of either standard silastic catheters or hydrogel coated catheters (Bioglide, Medtronic). The enrolment was available to neurosurgery patients undergoing shunt surgery from October 2012 to 2015 in two centers.

The follow-up period was more than months.A total of 78 patients were included in the study. In 33 patients 35-cm hydrogel-coated ventriculoperitoneal shunts (VPS) were used, and in remaining 45 patients 35-cm standard silastic VPS catheters were used.

Infection occurred in 14 (17.9%) patients, including definite VPS-related CSF infection in 6 patients (7.7%) and probable infection in remaining 8 patients (10.3%). There was a significant difference found in patients with total infection between the two groups [RR (95% CI); 0.200 (0.050-0.803), P=0.014]. Analysis of Kaplan-Meier curve estimates indicated significant statistical difference between the two catheter types in duration (log rank=4.204, P<0.05). Significant statistical differences were also found in the subgroups including previous CSF infection within 1 month (log rank=4.391, P=0.04), conversion of external ventricular drains to shunt (Log Rank=4.520, P=0.03), and hospital stay >1 month (log rank=5.252, P=0.02). There was no difference found between the two groups of the patients with other infections within 1 month. The follow-up period was of 36 months.The hydrogel coated catheter is a safe and related to lower infection rates for high-risk patients who underwent shunt surgery [1)].

2004

A prospective randomized clinical trial compared the occurrence of CSF infection related to use of either standard silastic or hydrogel coated EVD catheters (Bioglide, Medtronic). Enrolment was available to all adult neurosurgery patients undergoing placement of a first EVD, at three university centers. The catheters were presoaked in a low concentration of bacitracin solution for 5-10 minutes prior to insertion. Bacterial infection was defined by heavy growth in a single CSF sample or light/medium growth in two consecutive samples. A secondary analysis was also conducted for “probable” CSF infection, including patients started on antibiotics after light/medium growth in a single CSF sample. Statistical analyses included Kaplan-Meier survival curve estimates accompanied by Log Rank and Breslow tests.

There were 158 randomized patients available to assess for EVD related infection of CSF. The two study groups had similar clinical characteristics including average duration of EVD use (8 +/- 4 days). Definite CSF infection occurred in seven and probable infection in another six (8% total). Infection

incidence rose steadily from day 2 (1%) to day 11 (11%). There was no difference of daily occurrence of EVD infection between the two catheter types.

Infection remains a common hazard in the use of EVD, and we found no reduction of infection using the hydrogel-coated catheters when presoaked in low concentration bacitracin solution [2].

1)
Xu H, Huang Y, Jiao W, Sun W, Li R, Li J, Lei T. Hydrogel-coated ventricular catheters for high-risk patients receiving ventricular peritoneum shunt. Medicine (Baltimore). 2016 Jul;95(29):e4252. PubMed PMID: 27442653.
2)
Kaufmann AM, Lye T, Redekop G, Brevner A, Hamilton M, Kozey M, Easton D. Infection rates in standard vs. hydrogel coated ventricular catheters. Can J Neurol Sci. 2004 Nov;31(4):506-10. PubMed PMID: 15595257.