Efficacy of antimicrobial-impregnated external ventricular drain catheters: a prospective, randomized, controlled trial.

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Source

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Abstract

OBJECT:

Catheter-related infection of the cerebrospinal fluid (CSF) pathways is a potentially life-threatening complication of external ventricular drainage. A major source of infection is bacterial contamination along the external ventricular drain (EVD) catheter track. The authors examined the efficacy of EVD catheters impregnated with minocycline and rifampin in preventing these catheter-related infections.

METHODS:

The authors conducted a prospective, randomized clinical trial at six academic medical centers. All hospitalized patients 18 years or older who required placement of an EVD catheter were eligible for inclusion in the study. Patients were randomly assigned to undergo placement of an EVD with a catheter impregnated with minocycline and rifampin or a standard untreated catheter (control group). To assess primary outcome, CSF samples were collected using a sterile technique at the time of catheter insertion, at least every 72 hours while the catheter remained in place, and at the time of catheter removal. At the time of removal, CSF cultures were obtained from the tip and tunneled segments of each catheter by performing semiquantitative roll-plate and quantitative sonication techniques. Of the 306 patients enrolled in the study, data from 288 were included in the final analysis. Eighteen patients were excluded from analysis: 14 because the ventricular catheter was in place less than 24 hours, and four because CSF cultures obtained at the time of catheter insertion were positive for infection. Of these 288 patients, 139 were assigned to the control group and 149 to the treatment group. The two groups were well matched with respect to all clinical characteristics, including patient sex and mean age, indication for catheter placement, and length of time the catheter remained in place. The antibiotic-impregnated catheters were one half as likely to become colonized as the control catheters (17.9 compared with 36.7%, respectively, p < 0.0012). Positive CSF cultures were seven times less frequent in patients with antibiotic-impregnated catheters compared with those in the control group (1.3 compared with 9.4%, respectively, p = 0.002).

CONCLUSIONS:

The use of EVD catheters impregnated with minocycline and rifampin can significantly reduce the risk of catheter-related infections.