

Oral presentation

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Does the use of an antibacterial external ventricular drain increase the risk of resistance?

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Background

External ventricular drainage (EVD) catheters are used in temporary management of raised intracranial pressure. Infection, mainly ventriculitis, is a serious complication, with rates of around 12% reported [1]. Staphylococci are the most common cause but gram-negative bacteria such as *E coli* may also be involved. In order to reduce the infection risk, a catheter impregnated with antibiotics is available and reduced rates of infection (9% to 2.9%) have been reported in Nottingham, since it was first introduced in March 2006. However, its potential to select for resistant micro-organisms has yet to be investigated in a clinical setting. The microbial flora of the skin around the catheter was therefore investigated and isolates before and after catheterisation were compared to determine the effect of the antibiotic impregnated catheter on skin commensals.

Materials and methods

During the audit, swabs were obtained of the skin site before EVD insertion and again on removal. Swabs were cultured and any isolates were identified and tested for antibiotic susceptibility. Selected isolates were further investigated using pulse field gel electrophoresis to determine genetic similarity.

Results

128 swabs were obtained from 112 patients, of which 39 swabs did not grow any organisms. From the remaining

89 swabs, 170 organisms were isolated. 32 isolates being unavailable for analysis, the remaining 138 isolates (90 insertion; 48 removal) were then analysed using standard microbiological techniques. Antibiotic susceptibility index showed gram-positive isolates from removal swabs (43.0%) were more likely to be resistant to all the antibiotics tested, than insertion swabs (18.7%). All *Staphylococcus aureus* isolates were from insertion swabs; gram-negative organisms were also more frequent in insertion swabs (7 insertion; 2 removal). Pulse field gel was used to identify genetic similarity that may suggest mutational resistance, and was performed on 10 isolates displaying phenotypic resemblance. Only 2 pairs were identical, and neither showed increased resistance. There was also genetic similarity in a group of 3 isolates from removal swabs from different patients, suggesting dissemination of a "hospital" strain.

Conclusion

Change in skin flora after antimicrobial EVD was evident, with more resistant isolates in removal swabs but it is likely that they were acquired as a result of hospital stay rather than due to selection pressure from the catheter. Also, gram-negative bacteria and fungi were not increased when the antimicrobial catheter was used.

References

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