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Paper Poster Session
Vascular and vascular access infections

External ventricular drain infection: a quality improvement intervention can make a difference

Roisin Connolly*[1], Hilary Humphreys[2], Karen Burns[2], David P O'brien[3], Mairead Skally[2], Edmond Smyth[2]

[1]*University Hospital Limerick, Limerick, Ireland*

[2]*Beaumont Hospital, Department of Clinical Microbiology, Dublin, Ireland*

[3]*Beaumont Hospital, Department of Neurosurgery, Dublin, Ireland*

Background: Ventriculitis associated with the use of external ventricular drains (EVD) to drain cerebrospinal fluid (CSF) causes significant morbidity and mortality in neurosurgical patients. Factors such as drainage duration and frequency of device access increase infection risk. The aim of this project was to reduce rates of EVD-associated ventriculitis at a national neurosurgical referral centre.

Material/methods: Data from laboratory and clinical records were used to obtain information on EVD-associated ventriculitis cases retrospectively from January 2009 to November 2013. A protocol for inserting and accessing EVDs was introduced in November 2013. This intervention included minimising EVD manipulation and maximising strict aseptic technique while accessing EVDs. Post-intervention data on EVD-associated ventriculitis was prospectively collected from December 2013 to May 2014.

Results: During the pre-intervention period, EVD-associated ventriculitis occurred in 47 of 500 EVDs (9.4%), in 41 patients. Following the introduction of the care protocol, the rate was lower, 3/62 (4.8%), affecting three patients. The median interval from device placement to onset of infection was 12 days in both groups. Disruption or dislodgement of the EVD before infection onset ocurred in 11/47 (23.9%) and 1/3 (33.3%) in the pre-intervention group and post-intervention groups, respectively. Coagulase-negative staphylococci (CoNS) were the predominant pathogens in both groups, accounting for 17/47 cases (36.2%) in the retrospective group and all three cases in the prospective group. Where susceptibility data was available, a large proportion of CoNS in both pre- and post-intervention groups were resistant to clindamycin (11/14; 78.6% and 2/2; 100% respectively) and/ or rifampicin (10/ 18; 55.6% and 3/3; 100% respectively), which may reflect the routine use of antibiotic-coated EVDs. Other causes of ventriculitis in the pre-intervention period included Gram-negative bacilli (n=12; 25.5%), *Enterococcus* spp. (n=5; 10.6%), *Candida* spp. (n=4; 8.5%), *Staphylococcus aureus* (n=3; 6.4%), and other organisms (n=3; 6.4%: one each of *Coynebacterium striatum*, *Streptococcus parasanguinis* and *Streptococcus oralis*). There were three polymicrobial infections (6.4%).

Conclusions: A lower rate of EVD-associated ventriculitis was observed following the introduction of an EVD care protocol. Further follow up and education/training with the necessary resources are needed to promote continued best practice and to confirm reduced infection rates. Furthermore, standardisation of case definitions and reporting is required to allow comparison of rates between institutions in the future.