Is the NCHD Changeover Associated with Increased Risk of Intravenous Catheter Related Infections?

Sir,

Both central venous catheters (CVCs) and peripheral intravenous cannulas (PVCs) have changed the management of patient care in a hospital setting. However, there is a significant risk of local and/or blood stream infection with both. Indeed, every day the catheters remain in place increases the chances of developing a related blood stream infection. Healthcare associated infections (HCAIs) lead to increased morbidity and mortality, increased length of hospital stay, and costs. HCAIs are an important indicator of quality of care. Our hypothesis was that the non-consultant hospital doctor changeover at the beginning of July may have some impact on these quality indicators.

The primary aim of this study was to monitor the rates of CVC associated infections in a 649 bed teaching hospital for twenty days before and after the changeover. Secondary aims included monitoring of PVC related adverse events and blood culture contamination rates before and after the changeover.

Daily surveillance of all patients with CVCs in place was carried out on all long stay wards in the main hospital for the forty days of the study. All CVCs were inserted by senior medical staff in the radiology department. The same was performed for PVCs on a pre-selected medical and surgical ward for twenty-four days. The blood culture data was collected retrospectively from the microbiology laboratory computer system. The total number of CVC line days was 549 before the changeover and 681 afterward. The number of central catheter associated bloodstream infections per 1000 line days before and after the changeover was 10.9 and 1.5 respectively (p<0.05, Fisher's exact test). All of these infections were seen in haematology (5) and oncology (2) patients and were associated with Hickman lines (4), portacaths (2) and Peripherally Inserted Central Catheter lines (1). Adverse events, associated with peripheral cannulas, per 1000 line days on the medical ward, were 15.3 and 26.79 before and after the changeover respectively (p=0.67, Fisher's exact test). The same figures for the surgical ward, were 8.9 and 19.9 (p=0.65, Fisher's exact test). Blood culture contamination rates before and after the changeover were 3.55% and 5.13% respectively (p=0.26, Fisher's exact test). It is difficult to compare this to international figures as there is little data for similar institutions in the literature.

Overall a trend exists towards increased levels of adverse events associated with PVCs and contamination of blood cultures. Whilst not reaching statistical significance, this suggests support our hypothesis. However, the reduction in infections associated with CVCs contradicts our initial hypothesis. This may very well be a chance finding or may reflect greater adherence to recommended procedures following induction training and or may even be due to surveillance being carried out. The study was unfortunately very limited by its numbers as it was conducted at a single site however the issue may merit more comprehensive multi-site study in the future as there is growing recognition of the need for quality assurance systems in health care and major personnel changes represent a risk to quality for any service provider.

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References