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Sir,
In parallel with the NICE MTG review of Tegaderm 2% chlorhexidine (CHG) gel impregnated dressing (NICE, 2015)[1], the Epic3 scientific advisors reviewed the evidence and wording of the recommendation relating to the use of CHG impregnated dressings (Loveday et al 2014)[2] which currently states:

IVAD 20 "Consider the use of a chlorhexidine impregnated sponge dressing in adult patients with a central venous catheter as a strategy to reduce catheter related bloodstream infection." New recommendation Class B"

Following a review of the evidence[3,4] the Guideline Development Group (GDG) has revised the recommendation to include 2% CHG gel impregnated dressings in addition to 2% CHG impregnated sponge dressings.

Revised Evidence Summary

Catheter and Catheter Site Care

Infections can be minimised by good catheter and insertion site care
The safe maintenance of an intravascular catheter and appropriate care of the insertion site are essential components of a comprehensive strategy for preventing catheter-related infections. This includes good practice in caring for the patient's catheter hub and connection port, the use of an appropriate intravascular catheter site dressing regimen and using flush solutions to maintain the patency of the catheter.

Choose the right dressing for insertion sites to minimise infection
Following placement of a peripheral or central venous intravascular catheter, a dressing is used to protect the insertion site. Because occlusive dressings trap moisture on the skin and provide an ideal environment for the rapid growth of local microflora, dressings for insertion sites must be permeable to water vapour.[5] The two most common types of dressings used for insertion sites are sterile, transparent, semi-permeable polyurethane dressings coated with a layer of an acrylic adhesive ('transparent dressings') and gauze and tape dressings. Transparent dressings are permeable to water vapour and oxygen and impermeable to microorganisms.

Healthcare Infection Control Practices Advisory Committee (HICPAC) reviewed the evidence related to which type of dressing provided the greatest protection against infection,[6] including the largest controlled trial of dressing regimens on peripheral venous catheters (PVCs),[7] a meta-analysis comparing the risk of catheter related bloodstream infection (CR-BSI) using transparent versus gauze dressings[8] and a Cochrane review.[9] All concluded that the choice of dressing can be a matter of preference but if blood is leaking from the catheter insertion site, a gauze dressing might be preferred to absorb the fluid. We identified an updated Cochrane review,[10] which concluded that bloodstream infection was higher in the transparent polyurethane group when compared with gauze and tape. The included trials were graded low quality due to the small sample size and risk of bias. There was additional low quality evidence that demonstrated no difference between highly permeable polyurethane dressings and other polyurethane dressings in the prevention of catheter-related bloodstream infection.

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Healthcare Infection Control Practices Advisory Committee (HICPAC) reviewed the evidence related to impregnated sponge dressings compared to standard dressings[6] and found two randomised controlled trials (RCTs) in adults that demonstrated 2% chlorhexidine-impregnated sponge dressings were associated with a significant reduction in CR-BSI.[4,11] However, a meta-analysis that included eight RCTs found a reduction in exit site colonisation but no significant reduction in CR-BSI.[8] In paediatric patients, two small RCTs found a reduction in catheter colonisation but not CR-BSI, and evidence of localised contact dermatitis when used for infants of very low birth weight.[12,13]

We identified one further systematic review and meta-analysis, undertaken as part of a quality improvement collaborative, which synthesised the effects of the routine use of 2% chlorhexidine gluconate (CHG) impregnated sponge dressings in reducing centrally inserted CR-BSI.[14] Five studies were included in the analysis, two of the five studies were in patients in haemo/oncological intensive care units (ICU), the remaining three were in surgical and medical ICU; four of the five studies were sponsored by the manufacturer of the product. The reviewers concluded that 2% CHG impregnated sponge dressings are effective in preventing CR-BSI (OR 0.43; 95% CI 0.29 to 0.64) and catheter colonisation (OR 0.43; 95% CI 0.36. to 0.51).

We identified an economic evaluation of the use of 2% CHG impregnated sponge dressings and the non-inferiority of dressing changes at three and seven days.[16] Authors concluded that the major cost avoided by the use of CHG sponge dressings and seven day rather than three day dressing changes was the increased length of stay of 11 days associated with CR-BSI. Chlorhexidine impregnated sponge dressings remained cost saving for any value where the cost per CR-BSI was >$4,400 and the baseline rate of CR-BSI was >0.35%.[15]

We identified a further RCT of 2% CHG impregnated gel dressings compared with highly adhesive semi-permeable dressings or standard semi-permeable dressings for the prevention of CR-BSI in 1879 patients.[4] In the CHG gel group the major catheter related infection rate was 67% lower (0.7 per 1,000 *vs*. 2.1 per 1,000 catheter-days; HR 0.328; 95% CI 0.174 to 0.619; p=0.0006) and the CR-BSI rate 60% lower (0.5 per 1,000 *vs*. 1.3 per 1,000 catheter-days; HR 0.402; 95% CI, 0.186 to 0.868; p=0.02) than with non-chlorhexidine dressings. Decreases were also noted in catheter colonisation and skin colonisation rates at catheter removal. Highly adhesive dressings decreased the detachment rate to 64.3% *versus* 71.9% (p <0.0001) and the number of dressings per catheter to two (one to four) *versus* three (one to five) (p < 0.0001) but increased skin colonisation *(*p <0.0001) and catheter colonisation (HR 1.650; 95% CI 1.21 to 2.26; p=0.0016) without influencing CR-BSI rates.[4]

There have been no direct comparisons of the effectiveness and costs of CHG gel dressings impregnated with 2% CHG and 2%CHG sponge dressings.

Updated Recommendation IVAD 20

"Consider the use of a 2% chlorhexidine impregnated sponge or gel dressings in adult patients with a central venous catheter as a strategy to reduce catheter related blood stream infection."

Yours

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