Transparent Film Intravenous Line Dressing Incorporating a Chlorhexidine Gluconate Gel Pad: A Clinical Staff Evaluation

Tarja J. Karpanen, PhD, RGN
Department of Clinical Microbiology, University Hospitals Birmingham NHS Foundation Trust, Birmingham, UK
Anna L. Casey, PhD
Department of Clinical Microbiology, University Hospitals Birmingham NHS Foundation Trust, Birmingham, UK
Ira Das, MD, MBBS, FRCPath
Department of Clinical Microbiology, University Hospitals Birmingham NHS Foundation Trust, Birmingham, UK
Tony Whitehouse, MD, MBBS, FRCA, FFICM
Department of Anaesthetics and Intensive Care, University Hospitals Birmingham NHS Foundation Trust, Birmingham, UK
Peter Nightingale, PhD
Wolfson Computer Laboratory, Institute of Translational Medicine, University Hospitals Birmingham NHS Foundation Trust, Birmingham, UK
Thomas S. J. Elliott, PhD, DSc, FRCPath
Corporate Division, University Hospitals Birmingham NHS Foundation Trust, Birmingham, UK

Abstract

Background: *Chlorhexidine gluconate (CHG) has been shown to reduce the microbial load at intravascular (IV) catheter insertion sites and the risk of catheter-related infections. The Centers for Disease Control and Prevention and the UK National Institute for Health and Care Excellence subsequently recommended CHG-containing IV dressings for specific clinical indications.*

Aim: *To evaluate clinical staff perceptions of a standard transparent IV dressing in comparison to a transparent IV dressing incorporating a 2% (w/w) CHG gel pad when used at the insertion site of short-term central venous catheters and vascular access catheters for dialysis in adult critical care patients.*

Methods: *Following a 9-month trial period during which a CHG dressing was introduced to critical care patients at a university hospital, the staff perception of this dressing in comparison to a standard transparent IV dressing was evaluated by a questionnaire. The number of dressing changes required and skin condition under the dressing was also determined in a proportion of patients.*

Results: *The majority of the clinical staff (70 out of 81 respondents) considered the performance of the IV dressing containing a CHG gel pad better or much better than the standard dressing, and 77 out of 78 of the respondents recommended continuing its use. Both types of dressing performed well when applied to the insertion site of IV catheters in the internal jugular, subclavian, or femoral vein.*

Conclusions: *Staff satisfaction with the IV dressing incorporating a CHG gel pad was rated good, and the dressing performed well in a diverse group of critical care patients.*

Keywords: *CHG, critical care, CVC, IV dressing, vascath*

Correspondence concerning this article should be addressed to Tom.Elliott@uhb.nhs.uk
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Background

The incidence of bloodstream infections associated with the use of intravascular (IV) catheters is decreasing, partly due to enhanced adherence to catheter care bundles and improved technology.[1] These preventative measures include education and training of health care personnel who insert and maintain catheters; use of maximal sterile barrier precautions during central venous catheter (CVC) insertion; application of $>$ 0.5% (w/v) chlorhexidine with alcohol for skin antisepsis, and avoiding routine replacement of CVCs. These recommendations are based on strong clinical evidence; however, there is a paucity of data to support the selection of type of dressing.[2,3] There is a substantial body of evidence available on the use of dressings containing chlorhexidine gluconate (CHG) that demonstrate reduction in the incidence of both catheter-related infections and catheter site microbial colonization.[3-6] The Centers for Disease Control and Prevention Guidelines for the Prevention of IV Catheter-Related Infections[3] recommend the use of a CHG-impregnated sponge dressing on short-term catheters, and antiseptic/antibiotic-impregnated catheters, if in a particular unit the central line-associated bloodstream infection rate remains high despite adherence to basic preventative measures. The CHG-impregnated sponge, which is placed around the insertion site of IV catheters, requires a secondary, transparent IV dressing to be applied over it. More recently other antimicrobial dressings have been developed, including a transparent IV dressing incorporating 2% (w/w) CHG in an aqueous gel pad.[7-9] The use of the dressing containing CHG gel has been associated with a reduction in catheter-related sepsis.[4] Following a review of the available clinical efficacy data and economic evidence, the CHG gel dressing has been recently recommended by the UK National Institute for Health and Care Excellence to be used on critically ill adults who require a CVC or arterial catheter in intensive care or high dependency units.[10,11]

Aim of the Study

To evaluate clinical staff experience following the implementation of a transparent IV dressing containing a CHG gel pad after the use of a standard transparent IV dressing. The performance of both dressings at 3 different anatomic CVC insertion sites on 2 types of IV catheters inserted into a diverse group of critical care patients was also assessed.

Methods

Study Dressings

An adhesive, semipermeable, transparent polyurethane film dressing incorporating a transparent gel pad containing 2% (w/w) CHG (3M Tegaderm CHG IV Securement Dressing; 3M Health Care, St Paul, MN), was implemented for 9 months on the critical care unit at a university hospital. All patients who had a short-term CVC or vascular access catheter for dialysis inserted on the critical care unit or in operating theatres had a CHG dressing applied to the catheter insertion site. Two sizes of the CHG dressing were utilized: 10 cm $\times$ 15.5 cm (incorporating a 7.5 cm $\times$ 3.0 cm gel pad) and 8.5 cm $\times$ 11.5 cm (4.0 cm $\times$ 3.0 cm gel pad). In comparison, the standard dressing used in our hospital, a transparent IV dressing (3M Tegaderm IV dressing; 3M Health Care), which is an adhesive, semipermeable, polyurethane film dressing (8.5 cm $\times$ 11.5 cm in size), was studied in 2 phases (7 months before and 6 months after introduction of the CHG dressing) to reduce any coincidental temporal effect unrelated to the study dressings.

Staff Training

All staff working on the critical care unit and involved in the care of patients with a CVC had training and were competent in the care of CVCs, according to our hospital policy. The hospital guidance on CVC care reflects the UK epic3 and Saving Lives High Impact Interventions, which are similar to the Centers for Disease Control and Prevention guidelines on Prevention of Intravascular Catheter-Related Infections.[2,3] These guidelines highlight the main principles in the prevention of IV catheter-related infections, including correct hand decontamination, strict aseptic technique and rigorous skin preparation, meticulous catheter and site care, correct replacement strategy and prompt catheter removal, and regular catheter site observation (minimum of 8 hourly observations for inpatients). These guidelines also include indications for dressing change, which recommend that dressings are changed every 7 days or earlier if they become soiled, loosened, or fluid appears under the dressing.[2,3] To reiterate the correct CVC site care, posters describing the correct application and removal of the IV catheter dressings, indications for dressing change, and regular observation of the CVC site were also displayed on the unit throughout the study (during both the standard and CHG dressing study periods).

Before implementation of the CHG dressing, nursing staff competent in IV catheter care and anesthetists who insert IV catheters were given training in groups of 1-5. The training encompassed the correct method for applying and removing the dressing with emphasis on the differences between the 2 study dressings. The training also included ensuring that the skin antiseptic had fully dried before applying the dressing, applying the dressing without stretching it, positioning the CHG gel pad over the CVC insertion site, molding the gel pad around the CVC to ensure maximal skin contact, smoothing down the dressing with a full understanding of the effects of the pressure-sensitive adhesive in the dressing, and overlapping the sections behind the lumens to close the gap around the CVC lumens. In addition, the importance of observing the level of the CHG gel pad fluid saturation was emphasized. This was performed by lightly pressing the gel pad, and if the resulting pressure mark in the gel pad did not dissipate or if the gel itself became displaced, the dressing required replacement. To prevent skin trauma when the dressing was being removed, the importance of gently folding the dressing back on itself and slowly peeling the dressing toward the insertion site or in the direction of hair growth was emphasized. When the dressing incorporating a CHG gel pad was being removed, the gel pad was moistened with 1-2 drops of sterile fluid, such as saline, which facilitated removal. The importance of regular monitoring of the skin condition around the CVC insertion site and under the dressing, including inspection of