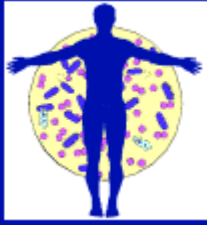




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Société belge d'infectiologie et de microbiologie clinique

Belgische vereniging voor infectiologie en klinische microbiologie

Catheter-related infections: practical aspects in 2003

A joint meeting of the *Société Belge d'Infectiologie et de Microbiologie Clinique / Belgische Vereniging voor Infectiologie en Klinische Microbiologie* (21st meeting) and the *Groupement pour le Dépistage, l'Etude et la Prévention des Infections Hospitalières / Group ter Opsporing, Studie en Preventie van Infecties in de Ziekenhuizen*

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Prevention of catheter-related infection

Critical review of CDC guidelines

Dr. K. Magerman

Virga Jesseziekenhuis, Hasselt

Introduction

- Revised guidelines of the CDC were published on August 9, 2002
- Guidelines replace the guideline which was published in 1996
- Working group led by Society of Critical Care Medicine, in collaboration with IDSA, SHEA, SIS, ACCP, ATS, ASCCA, APIC, INS, ONS, SCVIR, AAP and HICPAC of CDC

Introduction

- From 1996 until 2001 more than 2000 articles on “sepsis AND prevention” were published
- 293 references in the 2002 guideline :
 - 125 new references (27 randomized controlled studies, 4 meta-analyses)
 - 168 references from the 1996 guideline (15 randomized controlled studies, 1 meta-analysis)

Categories of recommendations

- I A.** Strongly recommended for implementation and strongly supported by well-designed experimental, clinical or epidemiologic studies.
- I B.** Strongly recommended for implementation and supported by some experimental, clinical or epidemiologic studies, and a strong theoretical rationale.

Categories of recommendations

I C. Required by state or federal regulations, rules, or standards

II. Suggested for implementation and supported by suggestive clinical or epidemiological studies or a theoretical rationale

Unresolved issue. Represents an unresolved issue for which evidence is insufficient or no consensus regarding efficacy exists.

Preventive strategies with strong supportive evidence

- *Educating and training of health care providers*
 - Educate (IA)
 - Assess knowledge of and adherence to guidelines periodically for all persons who insert and manage intravascular catheters (IA)
 - Ensure appropriate nursing staff levels in ICU (IB)

Preventive strategies with strong supportive evidence

- *Using full barrier precautions during central venous catheter insertion*
 - Use aseptic technique including the use of a cap, mask, sterile gloves, and a large sterile sheet, for the insertion of CVC or guidewire exchange (IA)

(Raad II et al., Infect. Control Hosp Epidemiol. 1994; 15:231-8)

Preventive strategies with strong supportive evidence

- *Using a 2% chlorhexidine preparation for skin antisepsis*
 - Although a 2 % chlorhexidine-based preparation is preferred, tincture of iodine, an iodophor, or 70 % alcohol can be used (IA)
 - No recommendation can be made for the use of chlorhexidine in infants aged < 2 months (unresolved issue)

Study	Catheter related bloodstream infection		
	CHG	Povidone-I	RR using CHG
Maki, 1991	1/214	6/227	0.18 (0.02-1.46)
Sheehan, 1993	1/169	1/177	1.05 (0.07-16.61)
Meffre, 1995	3/568	3/549	0.97 (0.20-4.77)
Mimoz, 1996	3/170	4/145	0.64 (0.15-2.81)
Legras, 1997	0/208	4/249	0.13 (0.01-2.45)
Humar,2000	4/193	5/181	0.75 (0.20-2.75)
Knasinski,2000	5/349	20/500	0.36 (0.14-0.95)
All studies			0.49 (0.28-0.88)

Preventive strategies with strong supportive evidence

- Different types of chg were used:
 - 0.5-1 % chg alcoholic solution
 - 0.5-2 % chg aqueous solution
- Only the subset of the 5 studies in which alcoholic solution was used produced a statistically significant reduction in catheter-related bloodstream infections
- FDA approved a 2 % tincture of chg preparation for skin antisepsis
- “other preparations of chlorhexidine may not be as effective”

Preventive strategies with strong supportive evidence

- *Replacement of intravascular catheters for prevention of infection*
 - Do not routinely replace central venous or arterial catheters solely for the purposes of reducing incidence of infection. (IB)
 - Replace peripheral venous catheters at least every 72-96 hours in adults to prevent phlebitis. Leave peripheral venous catheters in place in children until IV therapy is completed, unless complications. (IB)

- References:
 - Cobb et al., NEJM 1992; 327:1062-8
low number of patients
 - Cook et al., Crit Care Med 1997; 25:1417-24
objective of the study: to evaluate the effect of guidewire exchange and new-site replacement strategies
 - Thomas et al., Crit Care Med 1983;11:807-12
objective of the study: to evaluate the risk of infection related to radial vs femoral arterial catheterisation

Preventive strategies with strong supportive evidence

- *Using antiseptic/antibiotic impregnated short-term central venous catheters*
 - Use an antimicrobial or antiseptic-impregnated CVC in adults whose catheter is expected to remain in place >5 days if, after implementing a comprehensive strategy to reduce rates of CRBSI, the CRBSI rate remains above the goal set by the individual institution based on benchmark rates and local factors

- Comprehensive strategy should include:
 - Education
 - Maximal sterile precautions
 - 2 % chlorhexidine preparation for skin antisepsis during CVC insertion
- Which catheter ?
 - K.D. Marciante et al., AJIC, 2003;31:1-8, Which antimicrobial impregnated CVC should we use ?
Modeling the costs and outcomes of antimicrobial catheter use
Conclusion: minocycline/rifampin are cost-effective for patients catheterized for at least 1 week and lead to overall cost savings when patients are catheterized for 2 weeks or longer

- Controversy remains:
 - McConnell et al., CID, 2003;37:65-72, Do antimicrobial-impregnated CVC prevent catheter-related bloodstream infection ?
a review of eleven randomized studies revealed several methodological flaws and failed to demonstrate any significant clinical benefit

Novel strategies ?

- Antibiotic lock solutions
 - Do not routinely use antibiotic lock solutions to prevent CRBSI. Use prophylactic antibiotic lock solutions only in special circumstances (e.g. in treating a patient with a long-term cuffed or tunneled catheter or port who has a history of multiple CRBSIs despite optimal maximal adherence to aseptic technique). (II)

- Catheter lock solution (e.g. a combination of citrate and taurolidine, a biocompatible antimicrobial agent) dramatically reduces the frequency of CRBSI among patients undergoing hemodialysis

conclusion

- Simple interventions can reduce the risk for serious catheter-related infection. Health care provider awareness and adherence to these prevention strategies is critical to reducing the risk for CRBSI, improving patient safety, and promoting quality health care
- Novel techniques should be used carefully