

Prevention of hemodialysis catheter-related bacteraemia with an antimicrobial lock solution: a meta-analysis of prospective randomized trials.

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Background: Catheter-related bacteraemia (CRB) is a major cause of morbidity and mortality in hemodialysis patients. Intraluminal colonization of the catheter has been recognized as a crucial factor in the pathogenesis of CRB. Thus interdialytic locking of the catheter with one or more antimicrobial agents has recently been used for the prevention of CRB. We performed a meta-analysis to determine the efficacy of antimicrobial lock solutions in the prevention of CRB in hemodialysis patients.

Methods: We collected from Medline, Web of science, the Cochrane Library and major nephrology journals, all relevant references published from January 1990 to March 2007. We selected prospective, randomised controlled trials comparing an antimicrobial lock solution to a standard heparin lock in the prevention of CRB. We extracted data concerning studies quality, patients' characteristics and incidence of CRB (expressed as number of episodes per 1000 catheter-days). Relative risk (RR) was calculated by using the natural logarithm of the ratio of CRB rate per 1000 catheter-days using both a fixed and random effects model.

Results: Nine studies were identified involving 925 patients, 992 catheters and 129,976 catheter-days. A slight publication bias was observed with small negative studies being underrepresented. The use of antimicrobial lock solution was associated with a significant decrease of the risk of CRB (RR 0.353; 95% CI 0.112 to 0.411), with 77 CRB per 65,696 catheter-days in the antimicrobial lock group and 226 CRB per 64,280 in the control group. Borderline heterogeneity was observed in the fixed effects model ($Q=15.48$; $p=0.079$). Subgroup analyses stratified by: presence of diabetes, duration of follow up, serum albumin, serum ferritin, proportion of tunnelled cuffed catheters, use of intranasal mupirocin, and use of citrate or gentamycin in the lock solution will be presented .

Conclusions: The use of antimicrobial lock solutions reduces by about a factor 3 the risk of CRB in haemodialysis patients. However the absolute incidence achieved is similar to published figures from best practice centres using strict hygienic measures.