

implant fixation methods to address the knowledge gaps highlighted here.

See Online for appendix

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Chlorhexidine for prevention of catheter-associated urinary tract infections: the totality of evidence

We read the Article by Oyebola Fasugba and colleagues,¹ and the supporting Comment by Bart J Laan and Suzanne E Geerlings,² with great interest. In a cross-sectional, stepped-wedge, open-label, randomised controlled trial (RCT), Fasugba and colleagues assessed the efficacy of 0.1% chlorhexidine solution compared with saline solution for meatal cleaning before urinary catheter

insertion in reducing the incidence of catheter-associated asymptomatic bacteriuria and urinary tract infection (UTI). Meatal cleaning with 0.1% chlorhexidine before urinary catheterisation reduced the incidence of catheter-associated UTI by 94% compared with use of normal saline (incident rate ratio 0.06; 95% CI 0.01–0.32; $p=0.00080$).

Figure 3 of the study¹ showed that at one of the three participating centres (hospital A), a marked decrease in the incidence of catheter-associated UTI was observed in the intervention period compared with the control period, but the age and sex of the patients during the saline phase and the 0.1% chlorhexidine phase differed significantly. Although much lower than that of hospital A, the incidences of catheter-associated UTI in patients during the saline phase were similar at the other two hospitals. Therefore, the large decrease in the incidence of catheter-associated UTI in hospital A might have been due to bias.

The reduction in the incidence of catheter-associated UTI reported in this study might tempt health-care professionals to use a 0.1% chlorhexidine solution for urethral meatus cleaning instead of standard-of-care saline solution before urinary catheterisation. However, when all the evidence is considered, the efficacy of chlorhexidine is less robust. Based on the 2017 systematic review by Fasugba and colleagues,³ two RCTs evaluating the efficacy of chlorhexidine have been published.^{4,5} Both studies showed no significant benefit of chlorhexidine in meatal cleaning before urinary catheter insertion in reducing the incidence of UTI compared with a non-antiseptic agent (tap water). We did a meta-analysis summarising the data of these two studies and Fasugba and colleagues' RCT using a random-effects model with a generic inverse variance method. The pooled result did not show a significantly different incidence of catheter-associated UTI

between the two treatment groups (pooled risk ratio 0.49; 95% CI 0.13–1.89; $I^2=78%$; appendix).

This meta-analysis might serve as a reminder that the evidence on the efficacy of chlorhexidine solution for meatal cleaning in reducing the incidence of catheter-associated UTI is still evolving and more data from high-quality RCTs are needed before the use of chlorhexidine solution can be recommended and implemented.

We declare no competing interests.

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Authors' reply

We thank Patompong Ungprasert and Visanu Thamlikitkul for their interest in our Article.¹ We agree that the totality of evidence should be considered in clinical decision making; systematic reviews are helpful in this regard. We also agree that the evidence for the routine use of chlorhexidine to prevent urinary tract infection (UTI) would be stronger if our study was replicated in different hospitals or countries.

However, we have reservations about simply pooling results from the three studies identified because