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Clinical paper

Alcoholic chlorhexidine skin preparation or triclosan-coated sutures to reduce surgical site infection: a systematic review and meta-analysis of high-quality randomised controlled trials.

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Introduction

Surgical site infection (SSI) is the most common complication after surgery worldwide.

WHO and the UK's National Institute for Health and Care Excellence (NICE) recommend diverse interventions to prevent SSI, including the use of alcoholic chlorhexidine skin preparation and triclosan-coated sutures. However, the majority of studies supporting those recommendations were at high risk of bias through methodological weaknesses that are inherent to trials of SSI.

Purpose of the study

Aim of this study was to provide an efficient systematic review and meta-analysis of both alcoholic chlorhexidine skin preparation and triclosan-coated sutures interventions, by including a bespoke quality assessment specific to SSI randomized controlled trials (RCTs).

Methods

MEDLINE, Embase, PubMed, and Cochrane Library databases were used to identify high-quality RCTs testing either alcoholic chlorhexidine skin preparation (vs aqueous povidone-iodine) or triclosan-coated sutures (vs uncoated sutures), or both. No language restrictions were applied. Papers published from database inception to Sept 1, 2021, were included in the search. Patients who received clean-contaminated, contaminated, or dirty surgery were included.

An expert consensus process defined high-quality papers, in order to develop an enhanced Cochrane risk of bias-2 tool specifically for RCTs with a primary outcome of SSI. Data were extracted from published reports. Meta-analysis was performed using a random-effects model and heterogeneity was assessed using the I^2 statistic. This systematic review and meta-analysis was prospectively registered in PROSPERO, CRD42021267220.

Results

- The nominal group consensus process identified 8 essential domains containing 9 areas of bias.
- From 942 papers initially identified, 4 high-quality RCTs (n=7467 patients) on skin preparation and 5 high-quality RCTs (n=8619 patients) on suture type were included in the final analysis.

Alcoholic chlorhexidine vs aqueous povidone-iodine.

In the overall analysis, no significant differences were reported in the rates of SSI between alcoholic chlorhexidine and aqueous povidone-iodine (17.9% [667 of 3723 patients]) vs 19.8% [740 of 3744 patients]; odds ratio [OR] 0,.84 [95% CI 0.65–1.10]; p=0.21). There was moderate heterogeneity across trials (I^2=53% [95% CI 0.0–84.5]). No significant differences were found between groups in different degree of contamination settings.

Triclosan-coated sutures vs uncoated sutures.

In the overall analysis, there were no significant differences in rates of SSI between coated (16·8% [733 of 4360 patients]) and uncoated sutures (18.4% [784 of 4259 patients]; OR 0.90 [95% CI 0.74–1.09; p=0.29). There was moderate heterogeneity across trials (I2=36% [95% CI 0.0–76.2). No significant differences were found between groups in different degree of contamination settings.

Conclusion

Both alcoholic chlorhexidine and triclosan-coated sutures do not show any benefits compared to their analogues (aqueous povidone-iodine or uncoated sutures, respectively). Moreover, they are more expansive than other alternatives.

Hence, WHO and NICE recommendations to use routinely alcoholic chlorhexidine and triclosan-coated sutures should be reconsidered.

This concludes the clinical synopsis of this publication

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