Skin preparation for preventing infection following caesarean section

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RHL Summary

Key findings

- No significant difference in wound infection was found for comparisons of drape versus no drape; alcohol scrub and iodophor; drape versus iodophor scrub only; parachlorometaxylenol plus iodine versus iodine alone; and chlorhexidine gluconate versus povidone-iodine.
- No difference in endometritis was found for comparisons of alcohol scrub versus iodophor drape versus iodophor scrub only; and parachlorometaxylenol plus iodine versus iodine alone.
- Skin bacteria colony counts were reduced with chlorhexidine gluconate versus povidone-iodine, and not different between drape versus no drape.

Cord blood iodine concentration was increased with 70% alcohol + IOBAN 2 versus chlorhexidine 0.5%. There was no significant difference in neonatal 48-hour urine iodine excretion and day 5 thyroid-stimulating hormone levels.

Evidence included in this review

Six trials with a total of 1522 women were included in the review. Trials were included in Denmark, South Africa, USA and France.

Quality assessment

The trials were of low quality, except for the trial assessing skin bacterial colony counts, which was of very low quality.

Clinical Implications

There is no robust evidence favouring specific skin preparation methods. The clinical implications of increased cord blood iodine levels with IOBAN 2 are not clear.

Further Research

Larger trials are needed, particularly to compare iodine versus chlorhexidine, the timing (previous night versus day of surgery), and methods such as scrubbing versus swabbing versus draping.
Cochrane review


Abstract

The risk of maternal mortality and morbidity (particularly postoperative infection) is higher for caesarean section than for vaginal birth. With the increasing rate of caesarean section, it is important that the risks to the mother are minimised as far as possible. This review focuses on different forms and methods for preoperative skin preparation to prevent infection.

To compare the effects of different agent forms and methods of preoperative skin preparation for preventing postcaesarean infection.

We searched the Cochrane Pregnancy and Childbirth Group's Trials Register (26 June 2014) and the reference lists of all included studies and review articles.

Randomised and quasi-randomised trials, including cluster-randomised trials, evaluating any type of preoperative skin preparation agents, forms and methods of application for caesarean section.

Three review authors independently assessed all potential studies for inclusion, assessed risk of bias and extracted the data using a predesigned form. Data were checked for accuracy.

We included six trials with a total of 1522 women. No difference was found in the primary outcomes of either wound infection or endometritis. Two trials of 1294 women, compared drape with no drape (one trial using iodine and the other using chlorhexidine) and found no significant difference in wound infection (risk ratio (RR) 1.29; 95% confidence interval (CI) 0.97 to 1.71). One trial of 79 women comparing alcohol scrub and iodophor drape with iodophor scrub without drape reported no wound infection in either group. One trial of 50 women comparing parachlorometaxylenol plus iodine with iodine alone reported no significant difference in wound infection (RR 0.33; 95% CI 0.04 to 2.99).

Two trials reported endometritis, one trial comparing alcohol scrub and iodophor drape with iodophor scrub only found no significant difference (RR 1.62; 95% CI 0.29 to 9.16). The other trial of 50 women comparing parachlorometaxylenol plus iodine with iodine alone reported no significant difference in endometritis (RR 0.88; 95% CI 0.56 to 1.38). One trial of 60 women comparing chlorhexidine gluconate with povidone-iodine reported significant lower rates of bacterial growth at 18 hours after caesarean section (RR 0.23, 95% CI 0.07 to 0.70). No difference was found in the secondary outcome of either length of stay or reduction of skin bacteria colony count. No trial reported other maternal outcomes, i.e. maternal mortality, repeat surgery and re-admission resulting from infection. One trial, which was only available as an abstract, investigated the effect of skin preparation on neonatal adverse events and found cord blood iodine concentration to be significantly higher in the iodine group.
Most of the risk of bias in the included studies was unclear in selection bias and attrition bias. The quality of the evidence using GRADE was low for wound infection comparing drape versus no drape, one-minute alcohol scrub with iodophor drape versus five-minute iodophor scrub without drape, and parachlorometaxylenol with iodine versus iodine alone. The quality of the evidence for wound infection comparing chlorhexidine gluconate with povidone-iodine was very low.

This review found that chlorhexidine gluconate compared with iodine alone was associated with lower rates of bacterial growth at 18 hours after caesarean section. However, this outcome was judged as very low quality of evidence. Little evidence is available from the included randomised controlled trials to evaluate different agent forms, concentrations and methods of skin preparation for preventing infection following caesarean section. Therefore, it is not yet clear what sort of skin preparation may be most efficient for preventing postcaesarean wound and surgical site infection.

There is a need for high-quality, properly designed randomised controlled trials with larger sample sizes in this field. High priority questions include comparing types of antiseptic (especially iodine versus chlorhexidine), the timing and duration of applying the antiseptic (especially previous night versus day of surgery, and application methods (scrubbing, swabbing and draping).

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