

Prophylactic negative pressure wound therapy after cesarean delivery: a systematic review and meta-analysis

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Background/ Synopsis

In recent years, prophylactic single-use negative pressure wound therapy has been developed for cesarean delivery to decrease rates of surgical site infection. Many studies were evaluated in recent, conflicting meta-analyses published by Marcela Smid in 2017 and Lulu Yu in 2018, where one showed reduction in surgical site infection and the other did not. Since the publication of these articles, several new randomized control trials and cohort studies have been published on the topic.

Objective/ Purpose

To assess the association between prophylactic negative pressure wound therapy (NPWT) placement after cesarean delivery with postoperative infection and wound complications.

Methods

MEDLINE, Google Scholar, Cochrane, and clinicaltrials.gov were searched from January 1966 to March 2019 using key words “cesarean delivery”, “negative pressure”, “wound vacuum”, “wound infection”, and “surgical site infection”. Cohort and randomized clinical control trials were identified and selected. Criteria from the Cochrane Handbook and Newcastle Ottawa Scale were used to assess study quality. Studies were excluded if they lacked a suitable comparison group, sufficient quantitative data for extraction, or if the authors failed to provide a breakdown of composite outcomes. Meta-analyses were performed with the Stata statistical software package. Odds ratios and 95% confidence intervals were calculated.

Results

14 relevant studies, including 7 randomized control trials and 7 cohort studies were identified. Overall, 1,804 patients received NPWT and 3,022 patients received standard dressing. Randomized and cohort studies were analyzed both together and independently. When analyzed independently, cohort studies noted significant reduction in the odds of surgical site infection with NPWT (OR 0.43; 95% CI 0.23 – 0.82); however, the reduced odds of composite wound complication outcome did not achieve statistical significance (OR 0.58; 95% CI 0.20 – 1.66). Likewise, the reductions in odds of surgical site infection or composite wound complication found in analysis of randomized control trials did not achieve statistical significance (OR 0.70; 95% CI 0.49 – 1.02 and OR 0.87; 95% CI 0.62 – 1.22, respectively). When RCT and cohort studies were combined, odds of surgical site infection was significantly decreased (OR 0.59; 95% CI 0.42 – 0.84), but composite wound complication reduction did not achieve statistical significance (OR 0.74; 95% CI 0.44 – 1.22).

Conclusion

While randomized control trials did not find a significant decrease in surgical site infection or composite wound complication, cohort studies found a significant decrease in the odds of surgical site infection after cesarean delivery with the use of prophylactic negative pressure wound therapy.