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Review article

Uterine massage for preventing postpartum hemorrhage at cesarean delivery: Which evidence?



Gabriele Saccone^a, Claudia Caissutti^b, Andrea Ciardulli^c, Vincenzo Berghella^{c,*}

^a Department of Neuroscience, Reproductive Sciences and Dentistry, School of Medicine, University of Naples Federico II, Naples, Italy

^b Department of Experimental Clinical and Medical Science, DISM, Clinic of Obstetrics and Gynecology, University of Udine, Udine, Italy

^c Division of Maternal-Fetal Medicine, Department of Obstetrics and Gynecology, Sidney Kimmel Medical College of Thomas Jefferson University, Philadelphia, PA, USA

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ABSTRACT

Background: Cesarean delivery could be complicated by postpartum hemorrhage (PPH), the first cause of maternal death.

Objectives: To evaluate the efficacy of uterine massage in preventing postpartum hemorrhage at cesarean delivery.

Data sources: Electronic databases from their inception until October 2017.

Study eligibility criteria, participants, and interventions: We included all RCTs comparing uterine massage alone or as part of the active management of labor before or after delivery of the placenta, or both, with non-massage in the setting of cesarean delivery.

Data collection and analysis: The primary outcome was PPH, defined as blood loss >1000 mL. Meta-analysis was performed using the random effects model of DerSimonian and Laird, to produce summary treatment effects in terms of mean difference (MD) or relative risk (RR) with 95% confidence interval (CI).

Results: Only 3 RCTs comparing uterine massage vs no uterine massage were found. The quality of these 3 trials in general was very low with high or unclear risk of bias. All of them included only women in the setting of spontaneous vaginal delivery and none of them included cesarean delivery, and therefore the meta-analysis was not feasible.

Conclusions: There is not enough evidence to determine if uterine massage prevents postpartum hemorrhage at cesarean delivery.

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Contents

Introduction	65
Materials and methods	65
Search strategy	65
Study selection	65
Risk of bias	65
Outcomes	65
Statistical analysis	65
Results	66
Study selection and study characteristics	66
Synthesis of results	66

* Corresponding author at: Division of Maternal-Fetal Medicine, Department of Obstetrics and Gynecology, Thomas Jefferson University, 833 Chestnut Street, First Floor, Philadelphia, PA 19107, USA.

E-mail address: vincenzo.berghella@jefferson.edu (V. Berghella).

Discussion	66
Funding	67
Details of ethics approval	67
Compliance with ethical standards	67
References	67

Introduction

The first cause of maternal death worldwide is postpartum hemorrhage (PPH), responsible for an estimated 127,000 deaths annually. Failure of the uterus to contract adequately after childbirth is the most common cause of PPH. In the absence of timely and appropriate action, a woman could die within a few hours [1].

One of the most common complications of cesarean delivery (CD) is PPH, which can be life threatening [2–6]. In high-income countries, hemorrhage is reduced by routing active management of the third stage of labor, including removal of the placenta by controlled cord traction, and by using uterotonics after delivery, such oxytocin, to stimulate contraction of the uterus [2], or by using antifibrinolytics agents before CD, mainly tranexamic acid (TXA) [3,4].

As simple and inexpensive intervention, uterine massage, by repetitive massaging or squeezing movements, after delivery of the placenta in the setting of CD can also promote contraction of the uterus. However it is not known whether it is effective [6].

The aim of this systematic review and meta-analysis of randomized controlled trials (RCTs) was to evaluate the efficacy of uterine massage in preventing PPH at CD.

Materials and methods

Search strategy

This review was performed according to a protocol designed a priori and recommended for systematic review [7]. Electronic databases (i.e. MEDLINE, Scopus, ClinicalTrials.gov, EMBASE, Sciencedirect, the Cochrane Library at the CENTRAL Register of Controlled Trials, Scielo) were searched from their inception until October 2017. Search terms used were the following text words: “PPH,” “cesarean”, “caesarean”, “delivery”, “labor”, “labour”, “postpartum hemorrhage,” “bleeding,” “general anesthesia,” “morbidity,” “mortality,” “meta-analysis,” “metaanalysis,” “review,” “randomized,” “oxytocin,” “clinical trial,” “randomised,” “effectiveness,” “guidelines,” “bleeding,” “balloon” and “clinical trial.” No restrictions for language or geographic location were applied. In addition, the reference lists of all identified articles were examined to identify studies not captured by electronic searches. The electronic search and the eligibility of the studies were independently assessed by two authors (GS, CC). Differences were discussed with a third reviewer (VB).

Study selection

We included all published, unpublished and ongoing RCTs comparing uterine massage alone or as part of the active management of labor (including uterotonics) before or after delivery of the placenta, or both, with non-massage in the setting of CD. Quasi RCTs (i.e. trials in which allocation was done on the basis of a pseudo-random sequence, e.g. odd/even hospital number or date of birth, alternation) were not included. Studies on uterine massage in the setting of spontaneous or operative vaginal delivery were also excluded.

Risk of bias

The risk of bias in each included study was assessed by using the criteria outlined in the *Cochrane Handbook for Systematic Reviews of Interventions*. Seven domains related to risk of bias were assessed in each included trial since there is evidence that these issues are associated with biased estimates of treatment effect: 1) random sequence generation; 2) allocation concealment; 3) blinding of participants and personnel; 4) blinding of outcome assessment; 5) incomplete outcome data; 6) selective reporting; and 7) other bias. Review authors' judgments were categorized as “low risk”, “high risk” or “unclear risk” of bias [7].

Two authors (GS, CC) independently assessed inclusion criteria, risk of bias and data extraction. Disagreements were resolved by discussion with a third reviewer (VB).

Outcomes

All analyses were done using an intention-to-treat approach, evaluating women according to the treatment group to which they were randomly allocated in the original trials. Primary and secondary outcomes were defined before data extraction.

The primary outcome was PPH, defined as blood loss >1000 mL after trial entry. The secondary outcomes were blood loss >300, >500, >1500, >2000, and >2500 mL after trial entry; mean blood loss after trial entry; mean time to placenta delivery; use of additional uterotonics; use of other procedure for management of PPH; blood transfusion; and maternal death or severe morbidity.

We planned to assess the primary and secondary outcomes in the following subgroup analyses:

- Uterine massage before or after delivery of the placenta
- With or without uterotonics (e.g. oxytocin)
- With or without controlled cord traction

We also planned to assess the primary and secondary outcomes in the following sensitivity analyses:

- Type of uterine massage
- Trial quality

Statistical analysis

The data analysis was completed independently by two authors (GS, AC) using Review Manager v. 5.3 (The Nordic Cochrane Centre, Cochrane Collaboration, 2014, Copenhagen, Denmark). The completed analyses were then compared, and any difference was resolved by discussion with a third reviewer (VB).

Data from each eligible study were extracted without modification of original data onto custom-made data collection forms. For continuous outcomes means \pm standard deviation were extracted and imported into Review Manager v. 5.3.

Meta-analysis was performed using the random effects model of DerSimonian and Laird, to produce summary treatment effects in terms of mean difference (MD) or relative risk (RR) with 95% confidence interval (CI). Heterogeneity was measured using I-squared (Higgins I²).

Potential publication biases were assessed statistically by using Begg's and Egger's tests.

The meta-analysis was reported following the Preferred Reporting Item for Systematic Reviews and Meta-analyses (PRISMA) statement [8].

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