Induced termination of pregnancy and low birthweight and preterm birth: a systematic review and meta-analyses

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CRD summary
This review concluded that the risk of a child having a low birth weight or preterm birth increased for women with a history of pregnancy termination compared with those without such a history. This conclusion should be treated with caution due to the presence of clinical heterogeneity, confounders, and publication bias between the studies.

Authors' objectives
To review the risk of an infant being born with a low birth weight, preterm, or small for its gestational age, in women with a history of induced termination of pregnancy.

Searching
MEDLINE, EMBASE, and CINAHL were searched for articles published, in English, from their inception until August 2008. Search terms were reported and the bibliographies of retrieved articles were handsearched for additional material.

Study selection
Observational studies that assessed the association between an induced termination of pregnancy and babies with a low birth weight, preterm, or small for their gestational age, were eligible for inclusion. Eligible comparisons were: women with a history of an induced termination versus those without such a history; women with history of one or more induced termination versus women without this history; and women with an induced termination by different methods. Studies of spontaneous terminations were excluded.

The outcomes were low birth weight (under 2.5kg), preterm birth (gestational age less than 37 weeks), or small for gestational age (birth weight of less than the 10th centile for the gestational age). Most studies were performed in Europe or the USA. Participants were pregnant women, women with history of abortion, women undergoing abortion, women admitted for delivery, or infants (preterm or term births). The assessment of exposure was by interview, medical history, maternal history, medical records, hospital records, delivery records, prospective collection, or surveillance data.

Two reviewers independently selected studies for inclusion in the review.

Assessment of study quality
Study quality was assessed using a reported check list. Two reviewers performed the assessment and discrepancies were resolved by consensus.

Data extraction
The data were extracted into a predefined form. Odds ratios, mean differences, and their 95% confidence intervals were calculated. Two reviewers extracted the data.

Methods of synthesis
A random-effects meta-analysis was used to synthesise the odds ratios, weighted mean differences, and 95% confidence intervals. The population attributable risk was calculated, where a variable was identified as significant. Subgroup analyses for the method of induction of termination, by vacuum aspiration or medical induction, were performed. A sensitivity analysis for the date of publication was also performed. Heterogeneity was assessed using the $I^2$ test and funnel plots were used to assess publication bias.

Results of the review
Thirty-seven studies were included in the review; the total number of participants was unclear. The studies had a low-to-
A history of one induced termination of pregnancy was associated with an increased risk of low birth weight (OR 1.35, 95% CI 1.20 to 1.52; 18 studies, n=280,529 participants) and preterm birth (OR 1.36, 95% CI 1.24 to 1.50; 22 studies, n=268,379), but not babies that were small for their gestational age, compared with women with no such history. There was significant heterogeneity between the studies, for both low birth weight ($I^2=69\%$) and preterm birth ($I^2=64\%$) analyses.

A history of more than one induced termination of pregnancy was associated with an increased risk of low birth weight (OR 1.72, 95% CI 1.45 to 2.04; five studies, n=49,347) and preterm birth (OR 1.93, 95% CI 1.38 to 2.71; seven studies, n=158,421), compared with women with no history of induced termination. There was no evidence of heterogeneity between these studies.

Meta-analyses of adjusted risk estimates confirmed these findings. No correlation was found between the method of termination and any outcome nor the publication date and any outcome. Evidence of publication bias was found.

Authors’ conclusions
A previous induced termination of pregnancy was associated with a significantly higher risk of a low birth weight or preterm birth, but not babies who were small for their gestational age. This higher risk increased with increasing numbers of previous terminations.

CRD commentary
This review addressed a clear research question, supported by clear inclusion criteria. Three databases were searched, but this was restricted to English-language publications, which introduced a risk of language bias. There was no apparent search for unpublished material and funnel plots showed evidence of publication bias. Adequate steps were taken throughout the review process to minimise reviewer error and bias. The clinical heterogeneity, confounders, and variety in the assessment of exposure, between the studies, mean that the method of analysis might not have been appropriate. Subgroup and sensitivity analysis were limited by the small number of comparable studies.

The authors’ conclusions reflected the evidence, but should be treated with caution due to heterogeneity between studies and publication bias.

Implications of the review for practice and research
**Practice**: The authors stated that women should be informed of the risks associated with a termination of pregnancy, for their health and for their reproductive potential.

**Research**: The authors stated that research was needed to: assess the impact of newer termination techniques; identify the safest methods of termination and the adverse outcomes in subsequent pregnancies; assess whether increasing the awareness of the risks associated with termination reduces the incidence of terminations; and assess what support is effective in improving pregnancy outcomes for women with a history of termination.

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**Bibliographic details**

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