International Platform of Registered Systematic Review and Meta-analysis Protocols

INPLASY

Recurrence of Placental Abruption in Subsequent Pregnancies: A Systematic Review and Meta-analysis

INPLASY202690053
doi: 10.37766/inplasy2026.9.0053
Received: 12 September 2026
Published: 12 September 2026

Corresponding author:
Ehsan Rojhani

ehsanrojhani@gmail.com

Author Affiliation:
Comprehensive Fetal Care Center, Dell Children's Medical Center, Dell Medical School, The University of Texas at Austin.

Rojhani, E; Fathallah, AH; Hasegawa, A; Bank, R; Shamshirsaz, AA; Ogunleye, O; Oyelese, Y.

ADMINISTRATIVE INFORMATION

Support - No specific funding will support this systematic review and meta-analysis.

Review Stage at time of this submission - Formal screening of search results against eligibility criteria.

Conflicts of interest - None declared.

INPLASY registration number: INPLASY202690053

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 12 September 2026 and was last updated on 12 September 2026.

INTRODUCTION

Review question / Objective To estimate the recurrence of placental abruption in subsequent pregnancies among women with a history of placental abruption. The review will assess the absolute recurrence proportion and, where comparative data are available, compare the risk of placental abruption in subsequent pregnancies between women with and without a previous placental abruption. The review will also account for differences in study design, population, and recurrence definitions across the included studies.

Rationale Placental abruption is a serious obstetric complication associated with maternal hemorrhage, preterm delivery, fetal compromise, and perinatal death. Women who experience placental abruption in one pregnancy are known to have an increased risk of recurrence in a later pregnancy. However, the reported recurrence rates vary considerably across studies because of differences in study populations, diagnostic criteria, follow-up methods, and the way subsequent pregnancies are defined.

Although several cohort and registry studies have evaluated recurrent placental abruption, the available evidence has not been synthesized in a focused meta-analysis specifically addressing recurrence in subsequent pregnancies. A clearer estimate of recurrence is important for counseling women with a history of placental abruption, planning surveillance in future pregnancies, and identifying patients who may benefit from closer obstetric monitoring.

This systematic review and meta-analysis will summarize the available evidence on the absolute recurrence of placental abruption and, where comparative data are available, quantify the association between previous placental abruption and the risk of abruption in a subsequent pregnancy.

Condition being studied Placental abruption is the premature separation of a normally implanted placenta before delivery. It is an important obstetric complication that can result in maternal hemorrhage, preterm delivery, fetal compromise, and perinatal death.

A previous placental abruption is one of the strongest risk factors for abruption in a subsequent pregnancy. Longitudinal cohort studies consistently show a substantially higher recurrence rate among women with a history of abruption compared with women without a previous abruption. Recurrence estimates, however, vary across studies because of differences in study populations, case definitions, follow-up, and the number of subsequent pregnancies evaluated. This review will focus specifically on recurrent placental abruption and will estimate its frequency in subsequent pregnancies, while also evaluating comparative recurrence estimates when available.

METHODS

Search strategy A comprehensive literature search will be conducted in PubMed/MEDLINE, Embase, Scopus, and Web of Science. The search will combine terms related to placental abruption with terms related to recurrence and subsequent pregnancy. The main search terms will include "placental abruption," "placenta abruption," "placental separation," "abruptio placentae," "abruption placentae," "premature placental separation," and "premature separation of placenta," combined with "recurrence," "recurrent," "repeat abruption," "subsequent pregnancy," "next pregnancy," "future pregnancy," "following pregnancy," "second pregnancy," "later pregnancy," "consecutive pregnancy," "interpregnancy," "history of abruption," "previous abruption," "pregnancy after abruption," "pregnancy after placental abruption," "pregnancy following abruption," and "prior abruption." The search strategy will be adapted to the syntax of each database. Reference lists of eligible studies and relevant reviews will also be screened to identify additional studies.

Participant or population This review will include women with a documented history of placental abruption who have a subsequent pregnancy in which recurrence can be assessed. Eligible populations may come from population-based or national registries, linked birth records, integrated healthcare systems, or hospital-based cohorts.

Studies may assess recurrence in the immediately subsequent pregnancy, across later pregnancies, or during a defined period of follow-up, depending on the study design. For comparative analyses, studies may also include women without a previous placental abruption who have a subsequent pregnancy available for assessment.

Eligible studies must provide a clearly defined population at risk for recurrence and sufficient information to determine the number of women or pregnancies at risk and the number of recurrent placental abruptions. No restrictions will be placed on maternal age, parity, ethnicity, country, or healthcare setting.

Studies in which participants are selected based on placental abruption in the pregnancy being evaluated, without a longitudinally defined population at risk for recurrence, will be excluded.

Intervention The exposure under evaluation is a history of placental abruption in a previous pregnancy. Placental abruption may be identified by clinical diagnosis, hospital or registry records, or diagnostic coding, according to the definition used in each study. The previous abruption must occur before the subsequent pregnancy in which recurrence is assessed.

The review will evaluate recurrence of placental abruption in women with a previous abruption and, where comparative data are available, compare these outcomes with women without a history of placental abruption. No therapeutic intervention or procedure is being evaluated.

Comparator The comparator will be women without a history of placental abruption in the corresponding previous pregnancy who have a subsequent pregnancy available for assessment. Comparative analyses will evaluate the risk of placental abruption in subsequent pregnancies between women with and without a previous abruption.

For studies reporting only recurrence among women with a history of placental abruption, no comparator group will be required.

Study designs to be included This review will include prospective and retrospective cohort studies, longitudinal linked registry or birth-record studies, and hospital-based cohort or chart-review studies that report placental abruption recurrence in subsequent pregnancies. Both comparative and non-comparative cohorts will be eligible. Case-control studies without a defined population at risk for recurrence, cross-sectional studies, case reports, reviews, and editorials will be excluded.

Eligibility criteria Inclusion criteria:

Studies evaluating recurrence of placental abruption in women with a documented history of placental abruption

Studies with a longitudinally defined subsequent pregnancy or follow-up period
Studies providing an extractable number of recurrent abruptions and a corresponding population at risk
Comparative studies with a clearly defined group without previous placental abruption and either a reported effect estimate or sufficient data to calculate one
Prospective or retrospective cohort studies, linked registry studies, and hospital-based cohort or chart-review studies
Exclusion criteria:
Studies without a clearly defined population at risk for recurrence
Studies reporting only the proportion of current placental abruption cases with a history of previous abruption
Studies in which placental abruption cannot be separated from other placental disorders
Studies restricted exclusively to highly selected severe or transfusion-requiring placental abruption
Case reports, reviews, editorials, and other non-original studies
Studies lacking extractable recurrence data
For overlapping study populations, the most complete and relevant report will be selected to avoid double counting.

Information sources We will conduct a comprehensive literature search in PubMed/MEDLINE, Embase, Scopus, and the Web of Science Core Collection. Reference lists of eligible studies and relevant review articles will be screened to identify additional studies, and forward citation searching will be performed for included articles. PROSPERO and INPLASY will also be searched to identify related ongoing or registered systematic reviews. All search sources and additional studies identified through supplementary searching will be documented.

Main outcome(s) The primary outcome will be recurrent placental abruption in a subsequent pregnancy among women with a history of placental abruption. Recurrence will be defined according to the criteria used in each individual study and assessed during the subsequent pregnancy or pregnancies included in that study.
The main effect measure will be the absolute recurrence proportion, calculated as the number of recurrent placental abruptions divided by the number of women or subsequent pregnancies at risk, according to the study design. Pooled recurrence estimates will be reported with 95% confidence intervals.

Additional outcome(s) The secondary outcome will be the comparative risk of placental abruption in a subsequent pregnancy among women with versus without a history of placental abruption. Comparative effect estimates will include crude and adjusted odds ratios with 95% confidence intervals, where available. Crude and adjusted estimates will be analyzed separately to account for differences in confounder adjustment across studies.

Data management Search results will be imported into Rayyan, where duplicate records will be identified and removed before screening. Two reviewers will independently screen titles and abstracts, followed by full-text assessment of potentially eligible studies. Disagreements will be resolved by discussion and, when necessary, consultation with a third reviewer. Reasons for exclusion at the full-text stage will be recorded.
Data from eligible studies will be extracted into a standardized spreadsheet. Extracted variables will include study characteristics, data source, study period, definition of placental abruption, number of women with previous abruption, number of subsequent pregnancies analyzed, number of recurrent abruptions, recurrence rate, comparator data, crude and adjusted odds ratios with 95% confidence intervals, and adjustment variables. Extracted data will be checked against the full-text articles for accuracy, and any discrepancies will be resolved by review of the original study.

Quality assessment / Risk of bias analysis The methodological quality of included studies will be assessed using the National Institutes of Health (NIH)/National Heart, Lung, and Blood Institute (NHLBI) Quality Assessment Tool for Observational Cohort and Cross-Sectional Studies. The tool evaluates study population, selection of participants, measurement of exposure and outcomes, temporal relationship between exposure and outcome, follow-up, confounding, and statistical analysis. Studies will be rated as good, fair, or poor quality. Two reviewers will independently assess each study, and disagreements will be resolved by consensus or consultation with a third reviewer.

Strategy of data synthesis Data will be synthesized separately according to the definition of recurrence and the effect measure reported. The primary meta-analysis will estimate the absolute recurrence proportion using studies in which recurrent placental abruption is assessed in a defined subsequent pregnancy or delivery. A random-effects generalized linear mixed model with a binomial distribution and logit link will be

used, and pooled recurrence estimates will be presented with 95% confidence intervals.
Studies reporting recurrence across multiple later pregnancies or cumulative recurrence during follow-up will be analyzed separately because the unit of analysis and follow-up structure differ from studies assessing a single subsequent pregnancy.
For comparative studies, crude odds ratios will be calculated from the reported event counts and denominators and pooled using a random-effects model. Adjusted odds ratios reported by the original studies will be analyzed separately from crude estimates and will be pooled only when the exposure, comparator, and outcome definitions are sufficiently comparable.
Statistical heterogeneity will be assessed using the I^2 statistic and between-study variance (τ^2). A 95% prediction interval will be reported when appropriate. Leave-one-out analyses will be used to assess the influence of individual studies. When studies are not sufficiently comparable for quantitative synthesis, their findings will be summarized narratively. Statistical analyses will be performed using R.

Subgroup analysis Where sufficient data are available, subgroup analyses will be performed according to study setting and method of placental abruption ascertainment. Recurrence estimates will be compared between population-based or registry cohorts and hospital-based cohorts, and between studies using registry or diagnostic coding and those using clinical diagnosis. Subgroup analyses will be considered exploratory and will only be performed when sufficient comparable studies are available.

Sensitivity analysis Sensitivity analyses will be performed, where sufficient data are available, to assess the robustness of the pooled recurrence estimate. The primary analysis will be repeated after restricting the meta-analysis to population-based or registry studies and after excluding studies rated as poor quality. Leave-one-out analysis will also be performed, where feasible, by removing one study at a time to assess the influence of individual studies on the pooled estimate.

Language restriction English.

Country(ies) involved United States.

Keywords Placental abruption; abruptio placentae; recurrence; recurrent placental abruption; subsequent pregnancy; previous placental abruption; systematic review; meta-analysis.

Contributions of each author

Author 1 - Ehsan Rojhani - Conceptualization, methodology, literature screening, data extraction, statistical analysis, interpretation of results, and manuscript drafting and revision.
Email: ehsanrojhani@gmail.com
Author 2 - Ahmed Hashem Fathallah - Literature screening, statistical analysis, interpretation of findings, and critical revision of the manuscript.
Email: ahmed.abdelrahman@austin.utexas.edu
Author 3 - Akihiro Hasegawa - Literature screening, statistical analysis, interpretation of findings, and critical revision of the manuscript.
Email: akihiro.hasegawa@austin.utexas.edu
Author 4 - Rachel Bank - Data extraction, interpretation of findings, and drafting and revision of the manuscript.
Email: rachel.bank@ascension.org
Author 5 - Alireza Abdollah Shamshirsaz - Conceptualization, supervision, interpretation of findings, and critical revision of the manuscript.
Email: alireza.shamshirsaz@austin.utexas.edu
Author 6 - oluseyi ogunleye - Conceptualization, supervision, interpretation of findings, and critical revision of the manuscript.
Email: oluseyi.ogunleye@austin.utexas.edu
Author 7 - Yinka Oyelese - Conceptualization, supervision, interpretation of findings, and critical revision of the manuscript.
Email: koyelese@bidmc.harvard.edu