





Systematic Review

Pelvic inflammatory disease in pregnancy: a systematic review focusing on perinatal outcomes

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Abstract

BACKGROUND

Pelvic inflammatory disease during pregnancy is a rare and an understudied occurrence with potential negative outcomes.

OBJECTIVE

This study aimed to evaluate the outcomes of pregnant women with pelvic inflammatory disease with or without pelvic abscesses.

DATA SOURCES

We performed a systematic review of the literature using Ovid MEDLINE, Scopus, CINAHL, and PubMed (including Cochrane) with no time limitations.

STUDY ELIGIBILITY CRITERIA

Relevant studies on pelvic inflammatory disease during pregnancy were identified and considered eligible if they described at least 1 case of pelvic inflammatory disease after conception, defined as infection in one or more of the following: uterus, fallopian tubes, and ovaries; based on clinical findings, physical examination, and imaging with or without pelvic abscesses present. Only studies on pelvic inflammatory disease with or without tubo-ovarian abscesses during pregnancy that evaluated perinatal outcomes were included. Data on the risk factors, delivery methods, and maternal, fetal, and neonatal outcomes were collected.

METHODS

Reviewers screened all relevant titles using the inclusion/exclusion criteria and selected relevant articles for appraisal. A total of 49 cases with reported pelvic inflammatory disease, pelvic abscesses, or both were included.

RESULTS

After exclusion of articles that did not meet the inclusion criteria, 34 manuscripts describing the occurrence of pelvic inflammatory disease in 49 pregnancies were analyzed, focusing primarily on cases reported after 1971. The mean age of patients was 25 ± 6.3 years, the mean gestational age at diagnosis was 19.0 ± 10.3 weeks, and 67.6% of patients were multiparous. Of all included patients, 27 (62.8%) underwent exploratory laparotomies, 14 (32.6%) underwent unilateral salpingo-oophorectomies, and 11 (25.6%) underwent appendectomies. Of all the deliveries, 13 (50%) pregnancies were full term, 14 (53.8%) were cesarean deliveries, 10 (38.5%) were spontaneous vaginal deliveries, and 2 (7.7%) were cesarean hysterectomies. There were 26 (60.5%) cases of viable births (mean gestational age at delivery, 33.8 ± 5.1 weeks) and 17 (39.5%) cases of nonviable births. Sepsis was a complication in 3 (7.0%) cases and caused 3 neonatal deaths.

CONCLUSION

Although rare, pelvic inflammatory disease can have severe health consequences. Risk factors for pelvic inflammatory disease development include maternal pelvic structural anomalies, a history of sexually transmitted infections, recent pelvic surgery, and in vitro fertilization or oocyte retrieval. Pelvic inflammatory disease can coincide with pregnancy and can occur in the second trimester. Making a prompt diagnosis can help to improve the outcomes; therefore, if a high enough suspicion exists, treatment should not be delayed.

Introduction

Acute pelvic inflammatory disease (PID) coexisting with intrauterine pregnancy is not commonly reported because of its rarity, the difficulties with diagnosis, and determination of the etiology. Based on the National Health and Nutrition Examination Survey 2013–2014 data, 4.4% of women (2.5 million) aged 18 to 44 years in the United States reported a history of PID. The incidence or prevalence is not well reported in the literature, which only strengthens the need for our review and continued research on PID and pregnancy.¹

The cervical mucus plug and intact amniotic membrane protect against ascending infection; therefore, PID and associated tubo-ovarian abscess (TOA) during pregnancy are infrequent conditions.² Acute salpingitis is thought to occur more often in the first trimester but has been shown to occur later in pregnancy. A review by Acquavella et al³ found that PID occurred more frequently in the first trimester. The pathogenesis of PID and TOA in pregnancy is not fully known. The suggested mechanism of infection and development of disease includes hematogenous spreading, lymphatic spreading, infection in a previously existing ovarian cyst, and exacerbation of a preexisting infection.^{2,4} Other proposed pathogenic processes include the use of assisted reproductive technology, structural uterine anomalies, and gonococci attached to spermatozoa at the time of fertilization.^{4, 5, 6, 7} PID and TOA may increase maternal mortality and morbidity and pose a threat to the fetus. The challenges with diagnosis and the rarity of PID in pregnancy have made it difficult to study. To our knowledge, there are limited data on the prognosis and clinical guidance in these cases and there are no other systemic reviews on this topic. In this article, we review the available cases of PID with and without abscess in pregnant women, focusing on risk factors, management, and perinatal outcomes.

This study aimed to evaluate pregnancy outcomes in women with PID, with or without pelvic abscesses, during pregnancy. Second, this study aimed to broadly describe the clinical characteristics and risk factors for developing PID in pregnancy.

Section snippets

Search strategy

This literature review was performed using established protocols for systematic reviews and the Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines were followed. An extensive preliminary search was conducted using the electronic databases of PubMed, Cochrane Library, Scopus, Google Scholar, Ovid MEDLINE, and CINAHL from their inception to March 2021. The following key words and combinations of key words were used: (pelvic inflammatory disease) AND (maternity OR...

Study selection

In the preliminary search, 70 manuscripts were identified (Figure). All articles were case reports or small series. Of those, 15 articles were excluded based on title and abstract and 55 articles were used for further evaluation of the full text. After full-text evaluation, 10 articles that did not meet criteria were excluded, 11 articles were excluded from the final analysis because of the time criteria in that they were published before 1970, and 34 manuscripts describing PID in pregnancy...

Principal findings

The principal findings from this systematic review of the literature analyzing 45 cases of PID in pregnancy include findings related to maternal outcome and surgical procedures. The average mean gestational age was 19 weeks. Viable births were reported for around 60% of cases, with the remaining pregnancies ending in nonviable births and reports of 3 neonatal deaths. Of all patients, about two-thirds underwent exploratory laparotomies, about one-third underwent unilateral...

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Declaration of Competing Interest

The authors report no conflict of interest....

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References (47)

Tuboovarian abscess in pregnancy

Taiwan J Obstet Gynecol (2008)

AP Acquavella *et al.*

The coincident diagnosis of pelvic inflammatory disease and pregnancy: are they compatible?

J Pediatr Adolesc Gynecol (1996)

JWJ Orr *et al.*

Infected Müllerian anomaly: an unusual cause of pelvic abscess during pregnancy

Am J Obstet Gynecol (1986)

RR Genadry *et al.*

Gonococcal salpingitis in pregnancy

Am J Obstet Gynecol (1976)

L Yip *et al.*

Acute suppurative salpingitis with concomitant intrauterine pregnancy

Am J Emerg Med (1993)

G Patounakis *et al.*

Development of pelvic abscess during pregnancy following transvaginal oocyte retrieval and in vitro fertilization

Eur J Obstet Gynecol Reprod Biol (2012)

JW Kim *et al.*

Term delivery following tuboovarian abscess after in vitro fertilization and embryo transfer

Am J Obstet Gynecol (2013)

C Han *et al.*

In vitro fertilization complicated by rupture of tubo-ovarian abscess during pregnancy

Taiwan J Obstet Gynecol (2015)

CG Child *et al.*

Surgical problems arising during pregnancy

Am J Obstet Gynecol (1944)

RJ Lowrie *et al.*

Ruptured tuboovarian abscess at the seventh month of uterogestation

Am J Obstet Gynecol (1951)



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Cited by (4)

Tubo-ovarian abscess after vaginal delivery: A case report and review of current literature

2023, Case Reports in Women's Health

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Tubo-ovarian abscess: A potential mimicker of urachal malignancy

2022, Urology Case Reports

Citation Excerpt :

...Clinical presentation can mimic other conditions with non-specific findings such as leukocytosis and abdominal pain. In pregnancy, PID is rare but can lead to severe consequences with a recent systematic review reporting a viable birth rate of 60.5% and 62.8% of women undergoing exploratory laparotomies.³ The need for radical surgery and the unfortunate outcome of pregnancy loss in our patient may have likely resulted even if a tubo-ovarian abscess was suspected sooner and if her pain had been better controlled earlier in pregnancy....

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Pelvic inflammatory disease: a diagnostic challenge ↗

2023, Gynakologie

Atlas of Common Pain Syndromes ↗

2023, Atlas of Common Pain Syndromes

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