The Incidence of Intrauterine Adhesions Following Potentially Adhesiogenic Procedures: A Systematic Literature Review With Meta-Analyses

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Introduction

- Intrauterine adhesions (IUAs) are bands of fibrous scar tissue that form within the uterine cavity due to trauma to the basilar layer of the endometrium, often following surgical procedures or other uterine interventions.[1]
- First described in the late 19th century, the condition is now commonly referred to as Asherman disease when adhesions are present, and Asherman syndrome when accompanied by symptoms like infertility, amenorrhea, or recurrent pregnancy loss.[2,3]
- While mild cases may be asymptomatic, severe IUAs can result in light or absent menstruation, infertility, recurrent pregnancy loss, and inability to access the endometrial cavity for diagnostic testing.[4]
- Recurrence of IUAs is common, even when treated surgically, as the underlying trauma may not be corrected, leading to adverse obstetric outcomes including preterm birth, postpartum hemorrhage, and placenta accreta spectrum disorder, all of which can cause significant maternal and neonatal morbidity.[1]

Objective

- Despite several studies, understanding is limited regarding the true incidence and underlying causes of IUAs, which are thought to be variably associated with different surgical procedures and techniques. Herein, this study investigated the incidence of IUAs to improve understanding of their causes.

Methods

- A systematic literature review (SLR) and meta-analysis (MA) was conducted to seek evidence on IUA occurrences following select uterine procedures on menstrual, endometrial, fertility, and pregnancy-related outcomes.
- The search was conducted in the PubMed, Embase, and Cochrane databases following PRISMA guidelines and included publications prior to November 8, 2024.
- MAs were conducted separately for randomized clinical trials (RCT) and non-RCT studies.

Figure 1. IUA Incidence Following Hysteroscopic Metroplasty for Septa

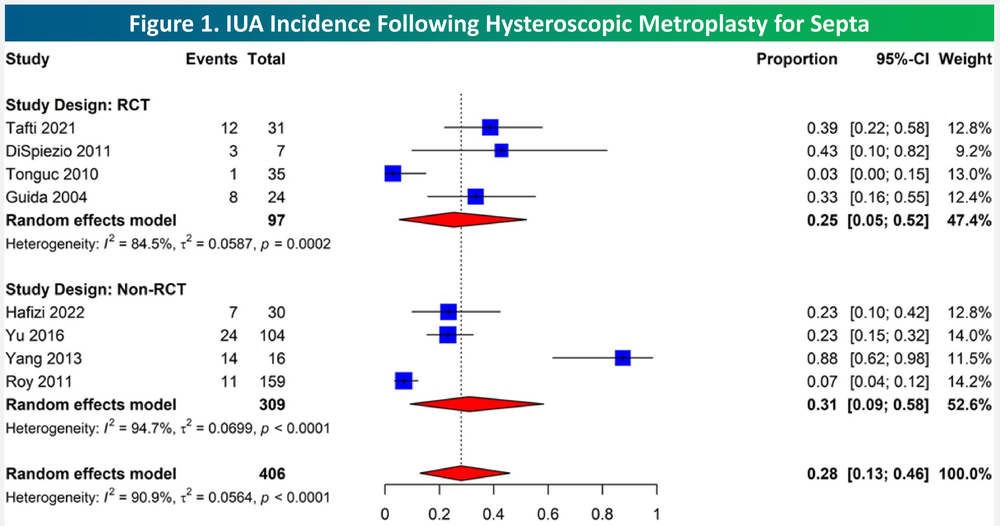


Figure 2. IUA Incidence Following Abdominal Myomectomy

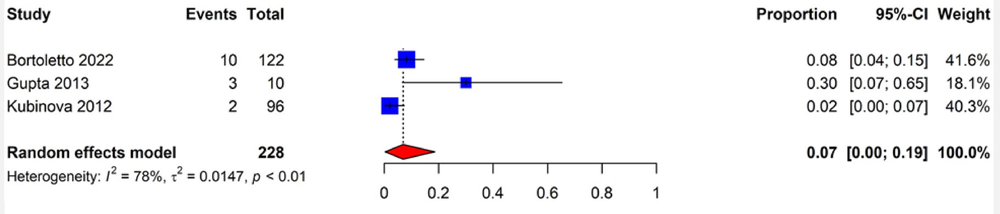


Figure 3. IUA Incidence Following Hysteroscopic Myomectomy

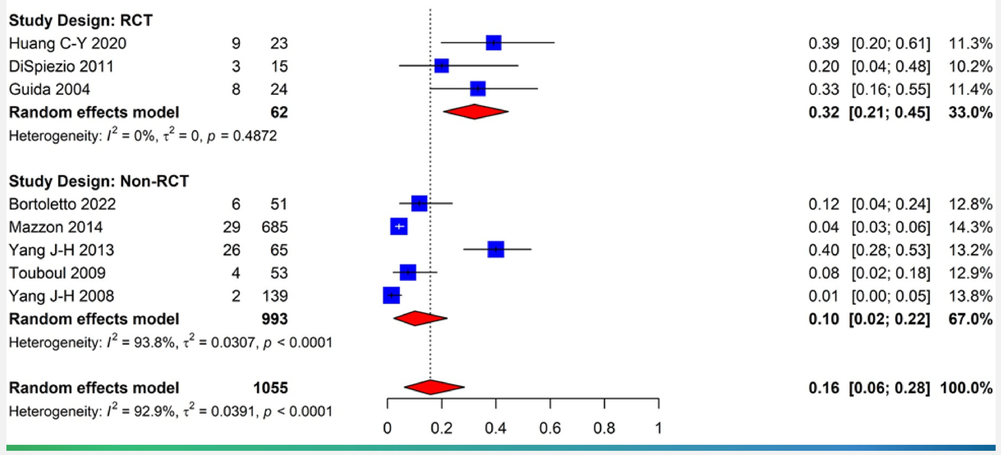


Figure 4. IUA Incidence Following Removal of Retained Products of Conception Post-Delivery

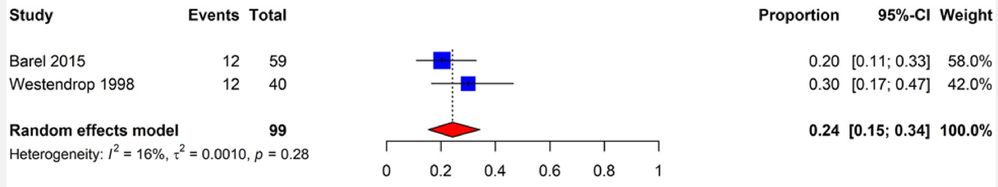
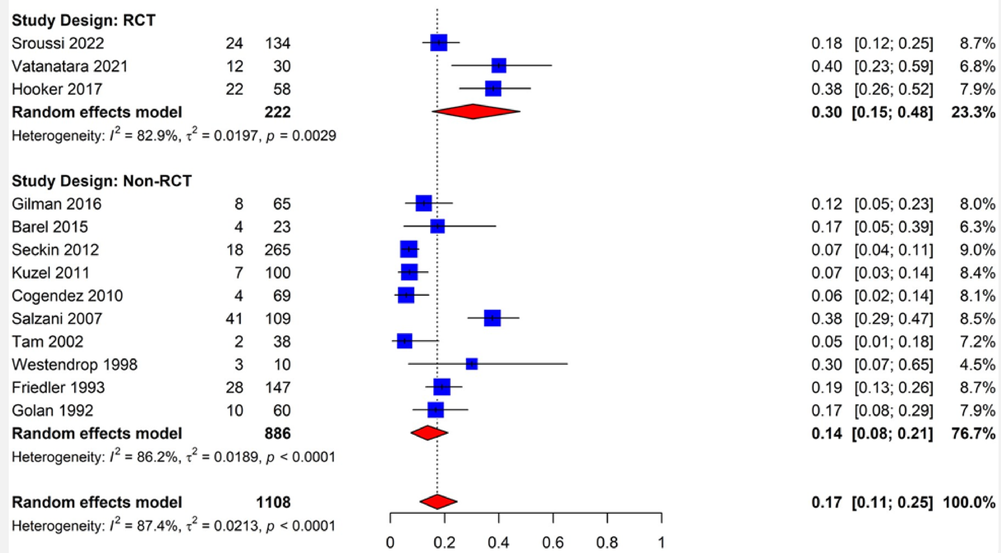


Figure 5. IUA Incidence Following Removal of Products of Conception in the First Trimester



Results

- Data from 28 studies were used for the 5 MAs displayed here.
- The incidence of IUAs varies depending on procedure and study type (RCT versus non-RCT).
- Following post-septum correction, the incidence of new-onset IUAs was 28% (95% CI: 13% - 46%; 8 studies, I^2 = 91%, fair to good evidence equality). When assessed separately by RCT or non-RCT design, the incidence was 25% (95% CI: 5% - 52%; 4 studies, I^2 = 85%, fair to good evidence quality) and 31% (95% CI: 9% - 58%; 4 studies, I^2 = 95%, fair to good evidence quality), respectively (Figure 1).
- The overall incidence of new-onset IUAs post abdominal myomectomy is 7% (95% CI: 0% - 19%; 3 studies, I^2 = 78%, fair evidence quality) (Figure 2).
- The incidence of new-onset IUAs post hysteroscopic myomectomy was 16% (95% CI: 6% - 28%; 8 studies, fair to good evidence quality). In RCT or non-RCT design, the incidence was 32% (95% CI: 21% - 45%; 3 studies, I^2 = 0%, fair to good evidence quality) and 10% (95% CI: 2% - 22%; 5 studies, I^2 = 94%, fair to good evidence quality), respectively (Figure 3).
- The incidence of IUAs following removal of products of conception post delivery is 24% (95% CI: 15% - 34%; 2 studies, I^2 = 16%, fair evidence quality) (Figure 4).
- The incidence of IUA after removal of products of conception in the first trimester, for RCT and non-RCT designs, was determined to be 30% (95% CI: 15% - 48%; 3 studies, I^2 = 83%, poor to good evidence quality) and 14% (95% CI: 8% - 21%; 10 studies, I^2 = 86%, poor to fair evidence quality), respectively, with pooled overall incidence of 17% (95% CI: 11% - 25%; 13 studies, I^2 = 87%, poor to good evidence quality) (Figure 5).

Strengths and Limitations

- **Strength:** rigorous SLR and MA techniques with broad search coverage.
- **Strength:** Expert clinical input was included from six clinicians with experience both hands on and in academia.
- **Limitation:** heterogeneity in study design, including variations in the nature and phenotype of the disease state
- **Limitation:** In many cases, there were insufficient data to make comparisons, and therefore, only proportional MAs could be conducted to assess the incidence of IUAs.

Conclusions & Implications

- The risk of IUA development appeared to vary between different types of surgical procedures performed. Certain procedures seem to carry high risk of IUA, such as septum correction or removal of retained products of conception post delivery
- Further, awareness of the relative risk associated with different procedures can guide surgical decision-making to help prevent IUAs and minimize long-term reproductive complications.
- In the future, a similar SLR should be conducted to capture more recent data.

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