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Review article

Medications to ease intrauterine device insertion: a systematic review☆,☆☆

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Abstract

Background: Potential barriers to intrauterine device (IUD) use include provider concern about difficult insertion, particularly for nulliparous women.
Objective: This study aims to evaluate the evidence on the effectiveness of medications to ease IUD insertion on provider outcomes (i.e., ease of insertion, need for adjunctive insertion measures, insertion success).
Search strategy: We searched the PubMed database for peer-reviewed articles published in any language from database inception through February 2016.
Selection criteria: We included randomized controlled trials (RCTs) that examined medications to ease interval insertion of levonorgestrel-releasing IUDs and copper T IUDs.
Results: From 1855 articles, we identified 15 RCTs that met our inclusion criteria. Most evidence suggested that misoprostol did not improve provider ease of insertion, reduce the need for adjunctive insertion measures or improve insertion success among general samples of women seeking an IUD (evidence Level I, good to fair). However, one RCT found significantly higher insertion success among women receiving misoprostol prior to a second IUD insertion attempt after failed attempt versus placebo (evidence Level I, good). Two RCTs on 2% intracervical lidocaine as a topical gel or injection suggested no positive effect on provider ease of insertion (evidence Level I, good to poor), and one RCT on diclofenac plus 2% intracervical lidocaine as a topical gel suggested no positive effect on provider ease of insertion (evidence Level I, good). Limited evidence from two RCTs on nitric oxide donors, specifically nitroprusside or nitroglycerin gel, suggested no positive effect on provider ease of insertion or need for adjunctive insertion measures (evidence Level I, fair).
Conclusions: Overall, most studies found no significant differences between women receiving interventions to ease IUD insertion versus controls. Among women with a recent failed insertion who underwent a second insertion attempt, one RCT found improved insertion success among women using misoprostol versus placebo.
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Keywords: Misoprostol; Lidocaine; Nitric oxide donors; Intrauterine devices; Insertion difficulty; Systematic review

1. Introduction

Intrauterine devices (IUDs) are highly effective contraceptive methods [1] that are generally safe for women, including adolescents and nulliparous women, based on the US Medical Eligibility Criteria for Contraceptive Use [2]. Although IUD use is increasing in the United States [3–5], rates remain lower than use of combined hormonal methods and condoms [4], which have higher failure rates due to greater dependence on user adherence. Potential barriers to IUD use include patient pain with insertion [6–8] and provider concern about difficult insertion, particularly for nulliparous women [9]. However, it has been shown that IUDs can be successfully inserted in nulliparous adolescents and young women, with high (96%) and similar first-attempt success rates as their parous counterparts [10]. Factors previously suggested to affect ease of IUD insertion or patient pain include age, parity, time of menses, time since last pregnancy, pregnancy delivery type, breastfeeding status, anticipated pain and IUD type [11–14], although

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findings are inconsistent. Identifying effective approaches to ease IUD insertion and reduce patient pain may increase IUD uptake by increasing the number and types of healthcare providers who perform IUD insertions.

Several systematic reviews have examined interventions to reduce pain with IUD insertion [15–18]. Medications examined have included nonsteroidal antiinflammatory drugs (NSAIDs), lidocaine, misoprostol and nitric oxide donors. Reviews have focused on patient outcomes including pain, side effects, adverse events and participant satisfaction. Provider outcomes such as ease of insertion, need for adjunctive insertion measures and insertion success have not been examined systematically. Since providers often initiate conversations about IUDs with women during contraceptive counseling [19] and may not discuss IUDs if there are concerns about difficult insertion, it is important to understand the effects of medications to ease IUD insertion on provider outcomes as well.

The US Centers for Disease Control and Prevention (CDC) publishes the US Selected Practice Recommendations for Contraceptive Use (US SPR) [20], which provides evidence-based guidance on a select group of common, yet sometimes complex, management issues around the initiation and use of specific contraceptive methods. Currently, the US SPR does not include recommendations for the provision of medications to ease IUD insertion. As part of a process to update the US SPR, the objective of this systematic review was to evaluate the evidence on the effectiveness of medications to ease IUD insertion on provider outcomes, to complement prior evidence [15] on the effectiveness of medications to ease IUD insertion on patient outcomes.

2. Materials and methods

We conducted this systematic review according to the PRISMA guidelines [21]. Our key question was whether patient use of a specific medication to ease IUD insertion improves provider outcomes compared with nonuse of the specific medication.

2.1. Literature search

We searched the PubMed database for peer-reviewed articles published in any language from database inception through February 2016 on the effect of medications to ease IUD insertion, using the following search strategy:

((((“Intrauterine Devices”[Mesh] OR “Intrauterine Devices, Copper”[Mesh] OR “Intrauterine Devices, Medicated”[Mesh] OR ((intrauterine OR intra-uterine) AND (device OR system OR contracept)) OR IUD OR iucd OR IUS OR mirena OR skyla OR paragard OR “Copper T380” OR CuT380 OR “Copper T380a” OR “Cu T380a”) NOT (“Animals”[Mesh] NOT “Humans”[Mesh]))) AND insert*) AND (((((((“Pain”[Mesh])) OR “adverse effects”[Subheading]) OR “Drug-Related Side Effects and Adverse Reactions”[Mesh]) OR “Patient Satisfaction”[Mesh]) OR “Anxiety”[Mesh])) OR ((((“Intrauterine Devices”[Mesh] OR “Intrauterine Devices, Copper”[Mesh] OR “Intrauterine Devices, Medicated”[Mesh] OR ((intrauterine OR intra-uterine) AND (device OR system OR contracept*)) OR IUD OR iucd OR IUS OR mirena OR skylab OR paragard OR “Copper T380” OR CuT380 OR “Copper T380a” OR “Cu T380a”) NOT (“Animals”[Mesh] NOT “Humans”[Mesh]))) AND insert*) AND (((((((“Pain”[Mesh])) OR “adverse effects”[Subheading]) OR “Drug-Related Side Effects and Adverse Reactions”[Mesh]) OR “Patient Satisfaction”[Mesh]) OR “Anxiety”[Mesh])) OR (pain OR “side effect*” OR “patient satisfaction” OR “ease of insertion” OR anxiety))*

The search strategy was broad to capture all potential medications. Additionally, we hand-searched reference lists from articles identified by the search and key review articles.

2.2. Selection criteria

We reviewed titles as well as abstracts to identify studies examining medications to ease IUD insertion. We included studies that examined insertion of currently available levonorgestrel-releasing (LNG) IUDs or any copper T IUD ever approved by the US Food and Drug Administration and distributed in the United States (i.e., Copper T380A, Copper 7, Copper T200B), for women of any age and for any indication. We included studies that examined multiple IUD types if the majority of women received an IUD meeting the above-mentioned criteria. We only included studies that examined interval insertion, and we excluded those that examined postabortion or postpartum insertion. We included studies that examined provider outcomes (i.e., ease of insertion, generally measured by a visual analog scale; need for adjunctive insertion measures, including cervical dilation, ultrasound guidance or paracervical block; and insertion success) but excluded studies that only reported patient outcomes (e.g., pain, side effects, satisfaction). We included only randomized controlled trials (RCTs) given the number of interventions identified addressing ease of IUD insertion.

2.3. Study quality assessment and data synthesis

The evidence was summarized and systematically assessed by two authors independently. The quality of each individual piece of evidence was assessed using the grading system developed by the United States Preventive Services Task Force [22]. We focused on several study factors when assessing quality, including randomization procedures, blinding of providers, study population, medication details, consideration of confounders and outcome measurement. We did not compute summary measures of association due to heterogeneity across the included studies related to study population, medication details and outcome measurement.

3. Results

The search strategy identified 1855 articles, of which 15 [23–37] met our inclusion criteria. Excluded studies were