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Intramuscular ketorolac versus oral ibuprofen for pain relief in first-trimester surgical abortion: a randomized clinical trial

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Abstract

Objective: Oral nonsteroidal antiinflammatory medications (NSAIDs) have been shown to reduce pain with first-trimester surgical abortion compared to placebo, but it is unclear if one NSAID is better than another. Some providers administer intramuscular ketorolac, though data regarding its efficacy in abortion are limited. This study was designed to compare oral ibuprofen to intramuscular ketorolac for pain management during first-trimester surgical abortion.

Study Design: This was a randomized, double-blind, controlled trial. Women undergoing first-trimester surgical abortion with local anesthesia were randomized to preprocedural oral ibuprofen, 800 mg given 60–90 min preprocedure, or intramuscular ketorolac, 60 mg given 30–60 min preprocedure. The primary outcome was pain with uterine aspiration on a 21-point, 0–100, numerical rating scale. Secondary outcomes included pain with cervical dilation, postoperative pain and patient satisfaction.

Results: Ninety-four women were enrolled; 47 were randomized to ibuprofen and 47 to ketorolac. The groups did not differ with regards to demographics, reproductive history or Depression Anxiety Stress Scale scores. Mean pain scores for suction curettage did not differ between groups (52.3 vs. 56.2, p=.53). There was also no difference in pain with cervical dilation (41.6 vs. 45.4, p=0.48) or postoperative pain (22.3 vs. 15.0 p=.076), though patients in the ketorolac group experienced significantly greater arm pain than those who received a placebo injection (30.4 vs. 15.6, p<.001). Satisfaction with pain control did not differ significantly by group.

Conclusions: Intramuscular ketorolac does not offer superior pain control compared to oral ibuprofen for first-trimester surgical abortion.

Implications: Intramuscular ketorolac does not offer superior pain control over oral ibuprofen during first-trimester surgical abortion, is more expensive and causes patients significant arm discomfort. Its use should therefore be reserved for patients who cannot tolerate oral NSAIDs.

Keywords: Surgical abortion; Pain control; NSAIDs; Ketorolac; Ibuprofen

1. Introduction

First-trimester surgical abortion is associated with a moderate amount of pain. While intravenous (IV) sedation and general anesthesia can minimize pain, some women prefer not to be sedated, and many others either cannot afford or do not have access to these types of anesthesia. Randomized placebo-controlled trials have shown that nonsteroidal antiinflammatory drugs (NSAIDs) are effective at reducing pain during first-trimester surgical abortions done with local anesthesia, but these studies examined the use of the oral (PO) preparations only [1,2].

Ketorolac is a potent NSAID with analgesic effects equivalent to commonly used doses of morphine or meperidine [3]. It acts on the cyclooxygenase pathway of arachadonic acid metabolism, resulting in inhibition of prostaglandin synthesis [4]. Ketorolac is frequently used in other clinical settings, especially for postoperative pain [3,5,6]; however, it has received minimal attention in the abortion literature. For abortion, ketorolac has only been studied in concert with general anesthesia or added to local anesthetic in a paracervical block [7,8]. In both of these studies, ketorolac appeared to offer benefit in terms of pain control. In patients who have no contraindications to PO medications, it is not clear that parenteral ketorolac offers a

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benefit over PO NSAIDs. Studies from the emergency medicine literature have demonstrated no significant difference between intramuscular (IM) ketorolac and PO NSAIDs for treatment of nonsurgical moderate pain [9,10].

Despite its relative lack of study in abortion, many facilities administer ketorolac to patients undergoing surgical abortion. Because of the significantly higher cost of ketorolac, as well as the discomfort associated with an IM injection, research is needed to clarify if the use of this medication is justified. This study was designed to compare the effect of preprocedural PO ibuprofen to IM ketorolac for pain in patients undergoing first-trimester surgical abortion. Our primary hypothesis was that pain scores would be reduced in the ketorolac group compared to the ibuprofen group.

2. Materials and methods

This was a randomized, double-blind, controlled trial. Subjects were women ages 18 and older seeking abortion at Planned Parenthood League of Massachusetts (PPLM) with gestations of 11 weeks 6 days or less as confirmed by ultrasound. This facility offers two equally priced options for pain control: ibuprofen and a paracervical block are standard of care for all, and eligible patients may also elect to receive IV sedation with midazolam and fentanyl. To be eligible for the study, women had to have chosen to undergo their procedure without IV sedation prior to being approached about study participation by the research assistant. We excluded women from the study if they had contraindications to any of the study medications, required cervical ripening, had a known fetal demise, had a history of long-term narcotic use or were non-English speaking without an appropriate interpreter available on the day of their procedure. The Partners Healthcare Institutional Review Board approved this study.

After written informed consent was obtained, participants completed a preprocedural questionnaire that included demographic information, the validated Depression Anxiety Stress Scales (DASS), questions regarding history of psychiatric disease, drug and alcohol use, baseline dysmenorrhea and questions regarding self-perceived pain tolerance, expected pain and acceptable pain levels for the abortion procedure. Patients were also asked about their reasons for choosing local anesthesia only. Additional demographic information and reproductive history were collected from the medical record.

We then randomized participants to receive either 800 mg of PO ibuprofen (600 mg if weight is <50 kg) 60–90 min prior to their procedure and a placebo IM injection 30–60 min prior to procedure, or a PO placebo 60–90 min prior to their procedure and 60-mg ketorolac in a 2 cc IM injection (30 mg in 1 cc if weight is <50 kg) 30–60 min prior to their procedure. We chose these time intervals to maximize the pharmacologic effect of both medications. The research manager created the randomization scheme using a computer-generated random number table, using varying block sizes of four and six, and allocation was concealed using sequentially numbered sealed opaque envelopes. The research assistant then made the randomization assignments by choosing the next sequentially sealed envelope for each participant. The PO placebo was 600 mg of calcium carbonate, and the IM placebo was normal saline (2 cc, or 1 cc if weight is <50 kg). The IM placebo was indistinguishable from ketorolac, and

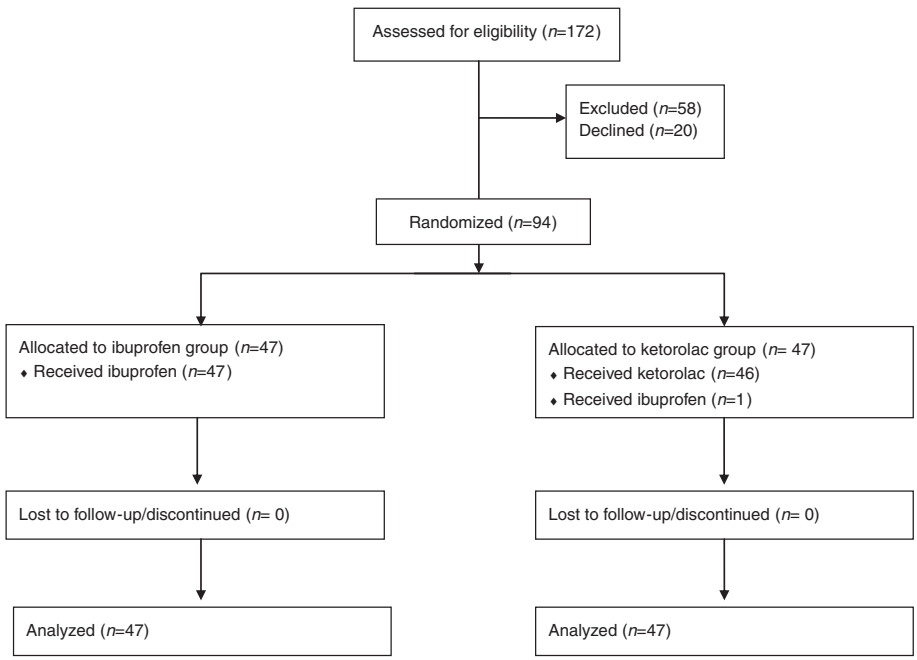

Fig. 1. Participant flow diagram.