Neuraxial anesthesia with the addition of opioids is the preferred technique for cesarean delivery because of the safety and efficacy of the technique compared with general anesthesia. However, pruritus associated with neuraxial opioids is reported by patients to be one of the most distressing side effects and is a source of patient dissatisfaction. The incidence of pruritus has been reported to be as high as 100%. This review examines the efficacy of different medications for the prevention of pruritus. An online database search of PubMed, Cochrane Database of Systemic Reviews, Cumulative Index to Nursing and Allied Health Literature, and Google Scholar revealed 127 potential evidence sources. Fifteen randomized controlled studies met the inclusion criteria.

Mixed opioid agonist-antagonists and dopaminergic receptor antagonists were found to be effective. Antihistamines, opioid antagonists, corticosteroids, and nonsteroidal anti-inflammatory drugs were found to be ineffective for the prevention of pruritus. Results conflicted regarding the efficacy of serotonin receptor antagonists and γ-aminobutyric acid receptor agonists for the prevention of pruritus caused by intrathecal opioid administration. The most promising evidence supported the use of nalbuphine and perhaps ondansetron. Findings of this review were incorporated into protocols for pain management for patients undergoing cesarean delivery and receiving intrathecal opioids.

Keywords: Complication, intrathecal, obstetrics, opioids, pruritus.
administration. However, surveys reveal that pruritus has interfered with some patients’ ability to enjoy their postbirth experience, including mother-baby bonding.2 Evidence was sought focusing on the administration of a single dose of medication to prevent pruritus after intrathecal opioid administration.

Materials and Methods

• The PICO Question. The formation of a PICO question assists a clinician in formulating a well-designed clinical research question.10 The 4 parts of the PICO question are (P) patient or population, (I) intervention, (C) comparison, and (O) outcome. The PICO question guiding this evidence-based search was “For those women (patient) undergoing a cesarean delivery receiving intrathecal opioids, is the prophylactic administration of a single dose of a medication (intervention) efficacious in preventing pruritus (outcome)?”

• Search Strategy. The following databases (1995-2015) were examined for potential evidence: PubMed, Cochrane Database of Systemic Reviews, the Cumulative Index to Nursing and Allied Health Literature (CINAHL), and Google Scholar. The “Similar Articles” feature in PubMed was also used to search for additional evidence. Only full-text, English-language sources from peer-reviewed journals or from professional organizations and government websites examining opioid-induced pruritus in human subjects were considered for review. The following levels of evidence were included: systematic reviews of randomized controlled trials (RCTs) and RCTs meeting the inclusion criteria not included in those systematic reviews. Studies included in more than 1 systematic review were noted, and studies included in systematic reviews meeting inclusion criteria were not appraised separately for this review.

The following search terms were used alone and in combination: pruritus, itching, prevention, intrathecal, neuraxial, opioids, agonist-antagonist, opioid antagonist, and cesarean delivery. Sources were included only when women receiving intrathecal opioids underwent a cesarean delivery where the study drug was administered to prevent, not treat, pruritus. The titles of the sources were first examined for inclusion, followed by the abstracts and finally the full texts. The evidence was appraised using the method described by Melnyk and Fineout-Overholt.11

Results

A total of 127 potential evidence sources were located, with 15 meeting the inclusion criteria (Figure, Table).12-26 Sources in which subjects received intrathecal opioids for labor or other surgeries and in which the study drug was administered to treat (not prevent) pruritus were excluded. Sources were also excluded if the aim of the study was to determine the effect of the selection of the intrathecal opioid on the incidence of pruritus.

The evidence sources were all RCTs examining pharmacologic methods used to prevent pruritus caused by the addition of opioids to local anesthetics injected into the subarachnoid space for women undergoing cesarean delivery.11 Three studies14,21,26 examined the effectiveness of a pure opioid antagonist. Two of the studies16,23 examined the efficacy of a mixed opioid agonist-antagonist, and 7 studies13,15,16,19,20,22,25 examined the effectiveness of 5HT3 receptor antagonists. The other sources examined (alone or compared with different medications): γ-aminobutyric acid A (GABAa) receptor agonists,12,18 antihistamines,13,18 D2 receptor antagonists,18 corticosteroids,24 and nonsteroidal anti-inflammatory drugs (NSAIDs).17,20

All studies except one14 were conducted by authors from outside the United States. Together, these 15 studies12-26 included 1,590 subjects. The sample sizes were determined by power analyses in all studies except 1.26 In all but 1 study,18 the researchers described blinding the person administering the medication as well as the subjects and observers. In that study,18 the blinding of the person administering the medication was questionable because the investigators used a white opaque treatment drug and a clear fluid placebo.

All evidence examined ASA physical status 1 or 2 subjects undergoing cesarean delivery with spinal or combined spinal-epidural anesthesia. Mean ages ranged from 2718 to 3426 years. Eight of the investigation groups administered preservative-free morphine as the sole intrathecal opioid;12,13,16-18,22,23,25 1 group reported the use of meperidine,24 and 1 group of investigators used fentanyl as the intrathecal opioid.20 One group of researchers used a combination of sufentanil and morphine in their study.13,15 and 4 groups of investigators reported using a combination of intrathecal fentanyl and morphine.14,19,21,26 All the researchers except two16,23 reported using bupivacaine as the local anesthetic for the spinal. One group24 reported the use of lidocaine, whereas the authors of another study18 did not specify which local anesthetic was used except to report that the providers chose either lidocaine or bupivacaine. Exclusion criteria included known allergies to any of the study drugs, preexisting pruritus, coexisting skin disorders, current drug use, contraindications to spinal anesthesia, pre eclampsia, eclampsia, major systemic diseases, and refusal to participate.

No adjuvant medication was used before the study medication except for the local anesthetic and opioid used in the spinal anesthetic in 7 of the studies.13,14,16,20,22,24,25 Four reported the administration of adjuvant medications before the intrathecal opioids,12,15,17,18 and 2 groups of researchers reported intravenous (IV) opioids given intraoperatively as needed.19,26 One group of investigators21 stated that subjects were given an antihistamine preoperatively and other adjuvant medications at the end of the surgery; however, these medications were not standardized. All subjects in 1 study26 received a 5HT3.
antagonist during the intraoperative course, and the authors specified only that it was given after the intrathecal morphine administration.

In all but 2 investigations, the treatment and control medications were administered after the delivery of the infant. Two groups of investigators indicated that the treatment and control drugs were administered 5 minutes after delivery, and 2 groups indicated that the subjects were given the treatment and control medications after delivery of the infant, without a specific time given. Six groups of investigators specified that treatment and control drugs were administered immediately after umbilical cord clamping, and the remaining 3 groups of investigators indicated that their study drugs were given at the end of surgery at the time of skin closure.

The placebo used in 12 studies was normal saline. The investigators in 1 study used distilled water, and 1 study investigation group used a lipid emulsion to blind the administrator because the treatment drug was also a white opaque solution. One group of investigators used an empty capsule as a placebo.

All the investigators assessed the incidence and severity of pruritus. Observers asked subjects to rate their pruritus using a numerical rating scale and descriptors such as “none,” “bothersome,” and “severe” in 10 of the studies. Three groups of researchers used a 0 to 10 scale to rate the intensity of the pruritus from “none” to “worst ever.” Two groups of authors assessed the severity of pruritus using only descriptors such as absent, mild, moderate, and severe. Thirteen of the studies’ authors did not describe methods used to assess the validity or reliability of their measurement scales.12,20,22,24-26 Two groups of researchers cited the use of scales from previously published pruritus studies, and 1 of these authors reported that the scale was modified from the originally published scale.

**Discussion**

The results were not consistent for the different classes of drugs in the prevention of pruritus after neuraxial administration of opioids for women undergoing cesarean delivery (see Table).

- **Opioid Receptor Antagonists.** Three groups of investigators examined the efficacy of pure opioid receptor antagonists for the prevention of pruritus. All 3 groups concluded that the intervention doses of opioid antagonists were ineffective. Nalmefene is a water-soluble form of naltrexone that has a half-life of 8.5 hours. One group of researchers examined the effect of a 50 mL IV piggyback solution containing 0.25 µg/kg nalmefene administered prophylactically after delivery of the neonate. The researchers noted overall higher pruritus scores in the placebo group than in the treatment group, but the only statistically significant differences were noted at the 10-hour and 11-hour assessments.

One group of researchers examined the effect of a subcutaneous (SQ) injection containing 400 µg of naloxone, a pure µ-opioid antagonist. The SQ route was chosen due to the duration of action of SQ naloxone reported to be between 1.5 hours and at least 48 hours. This group of researchers assessed the severity of pruritus requiring antipruritic treatment at 8 hours and 24 hours. They found no difference in the incidence of pruritus at either the 8-hour or 24-hour assessments.

Methylnaltrexone is a peripherally acting µ-opioid antagonist that was developed to counteract opioid-induced constipation. Investigators have incidentally found that methylnaltrexone could reduce pruritus induced by systemic morphine. The authors suggested that morphine-induced pruritus might be peripherally mediated, and methylnaltrexone may be beneficial as a preventive treatment. This group of researchers examined a 12 mg dose of methylnaltrexone delivered via SQ route to prevent pruritus. There was no statistical difference in the incidence of pruritus in the intervention group (84%) compared with the control group (88%, P = .48). No analgesic or gastrointestinal side effects were reported.

- **Mixed Opioid Receptor Agonist-Antagonists.** Two groups of investigators examined the effects of mixed opioid agonist-antagonists. Butorphanol has antagonist activity at the µ-opioid receptor and agonist activity at the κ-opioid receptor. Studies suggest that medications that stimulate the κ-opioid receptor may produce antipruritic effects. One group of investigators administered IV butorphanol (1 mg/mL) followed by a continuous IV infusion of 0.2 mg/2 mL/h butorphanol for 24 hours after the delivery of the newborn. This treatment resulted in a...
<table>
<thead>
<tr>
<th>Source</th>
<th>N</th>
<th>Intrathecal opioid</th>
<th>Intervention and control</th>
<th>Incidence of pruritus, No. (%)</th>
<th>Comments</th>
</tr>
</thead>
</table>
| Warwick et al,12        | 58 | Morphine, 200 µg            | Propofol, 10 mg IV (n = 29), Lipid emulsion, 1 mL IV (n = 29) | 18 (62)                      | • Data sheets lost for 1 subject; 1 protocol violation  
• 2 subjects in each group received IV opioids; 1 subject received IV midazolam, 2.5 mg  
• Failed to attain the recommended number of subjects based on power analysis  
• Subjects were assessed hourly for 8 hours after induction of spinal anesthesia |
| Yeh et al,13            | 60 | Morphine, 150 µg            | Ondansetron, 0.1 mg/kg IV (n = 20), Diphenhydramine, 30 mg IV (n = 20), Normal saline, 1 mL (n = 20) | 5 (25)                       | • Mean ondansetron dose = 7.1 mg  
• Subjects were assessed every 5 minutes for 2 hours, every 15 minutes for 2 hours, then every 30 minutes for 24 hours  
• Evaluations were done for 28 hours postoperatively |
| Pellegrini et al,14     | 60 | Morphine, 250 µg, Fentanyl, 12.5 µg | Normal saline, 50 mL IVPB (n = 30) | Approximately 35%            | • Evaluations were done every hour for 12 hours postoperatively, then every 2 hours thereafter  
• Overall higher pruritus scores in placebo group but only statistically significant at 10 and 11 hours |
| Yazigi et al,15         | 100 | Sufentanil, 2.5 µg, Morphine, 100 µg | Ondansetron, 8 mg IV In = 50, Normal saline, 5 mL IV In = 50 | 38 (76)                      | Subjects were assessed every 10 minutes in the operating room and in the recovery room, then every 2 hours over the next 24 hours |
| Charuluxananan et al,16 | 240 | Morphine, 200 µg            | Nalbuphine, 4 mg IV (n = 60), Ondansetron, 4 mg IV (n = 60), Ondansetron, 8 mg IV (n = 60), Normal saline, 4 mL IV (n = 60) | 15 (25)                      | Evaluations were done every 15 minutes for 4 hours, then at 4, 8, and 24 hours after surgery |
| Lee et al,17            | 60 | Morphine, 300 µg            | Celecoxib, 200 mg po In = 30, Empty capsule po (n = 30) | 9 (30)                       | Pruritus scores were assessed and recorded at 30 minutes and 2, 4, 8, and 24 hours after the administration of intrathecal morphine |
| Horta et al,18          | 300 | Morphine, 200 µg            | Alizapride, 100 mg IV (n = 60), Propofol, 20 mg IV (n = 60), Droperidol, 1.25 mg IV (n = 60), Promethazine, 50 mg IV (n = 60), Distilled water, 2 mL (n = 60) | 51 (85)                      | No mention of person administering drug being blinded  
• Only mention of observers and subjects being blinded  
• Evaluations were done 3 and 6 hours after administration of anesthesia, then at least once daily until discharge |
| Sarvela et al,19        | 98 | Morphine, 160 µg, Fentanyl, 15 µg | Ondansetron, 8 mg IV In = 30, Normal saline, 5 mL IV In = 29 | 11 (39)                      | • CSE technique used  
• 11 subjects excluded because of greater than 5 mL of epidural top up  
• 2 questionnaires lost in tropisetron group  
• Evaluations done 2 and 3 hours after induction of spinal anesthesia, then every 3 hours after placement on ward |
| Gulhas et al,20         | 108 | Fentanyl, 25 µg             | Lornoxicam, 8 mg IV In = 36, Ondansetron 8 mg IV (n = 36), Normal saline, 2 mL IV In = 36 | 4-12 h                       | 1 subject in each group was excluded because they required epidural top-ups  
• Significant difference between the ondansetron group and placebo and lornoxicam groups at the 4- to 12-hour assessment  
• Assessments were done every 2 hours for 24 hours after induction of spinal anesthesia and at least once daily until discharge |
<table>
<thead>
<tr>
<th>Study</th>
<th>Intrathecal Opoid Dose</th>
<th>Pharmacologic Method</th>
<th>Evaluation Time</th>
<th>Results</th>
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</thead>
<tbody>
<tr>
<td>Lockington &amp; Fa'aea (2007)</td>
<td>Morphine, 150 µg Fentanyl, 25 µg</td>
<td>Naloxone, 400 µg SQ (n = 24) Normal saline, 1 mL SQ (n = 23)</td>
<td>8 h, 24 h</td>
<td>17 (74) 9 (38) 11 (48) 5 (22)</td>
</tr>
<tr>
<td>Siddik-Sayyid et al (2007)</td>
<td>Morphine, 200 µg Gransisetron, 3 mg IV (n = 42) Ondansetron, 8 mg IV (n = 42) Normal saline, IV (n = 45)</td>
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<td>Wu et al (2012)</td>
<td>Morphine, 100 µg Butorphanol, 1 mg IV, then CI 0.2 mg/2 mL/h for 24 hours (n = 46) Normal saline 1 mL IV then CI (2 mL/h) for 24 hours (n = 45)</td>
<td></td>
<td>6 (13) 22 (48.9)</td>
<td></td>
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<tr>
<td>Banihashem et al (2013)</td>
<td>Meperidine, 25 mg Dexamethasone, 8 mg IV (n = 25) Normal saline, 1 mL (n = 27)</td>
<td></td>
<td>10 (43.5) 13 (66.5)</td>
<td></td>
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<tr>
<td>Koju et al (2015)</td>
<td>Morphine, 200 µg Ondansetron, 4 mg IV (n = 25) Normal saline, 2 mL IV (n = 29)</td>
<td></td>
<td>4 (16) 22 (88)</td>
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</tr>
<tr>
<td>Paech et al (2015)</td>
<td>Morphine, 100 µg Fentanyl, 15 µg Methylnaltrexone, 12 mg/0.6 mL SQ (n = 68) Normal saline, 0.6 mL SQ (n = 68)</td>
<td></td>
<td>58 (84) 60 (88)</td>
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</table>

### Table: Randomized Controlled Trials Examining Pharmacologic Methods of Preventing Pruritus for Women Undergoing Cesarean Delivery Under Spinal Anesthesia With the Addition of Intrathecal Opioid

**Abbreviations:** BMI, body mass index; CI, continuous infusion; CSE, combined spinal-epidural; IV, intravenous; IVPB, intravenous piggyback; NSAID, nonsteroidal anti-inflammatory drug; po, orally; SQ, subcutaneous.

- Overall incidence unless otherwise noted, number (%).
- Incidence of pruritus defined as pruritus score > 2 (maximum score = 4).
- P < .01 compared with normal placebo group and diphenhydramine group.
- Incidence estimated from graph of survival data for pruritus treatment. The small decrease in number of subjects requesting treatment for pruritus in the normal placebo group was not statistically significant.
- Incidence of pruritus defined as the subject requesting treatment of pruritus.
- P < .001 compared with placebo.
- P = .006 compared with placebo.
- Reported to be significantly less than placebo, but level of significance not given.
- P < .05 compared with subjects in the lornoxicam and placebo groups.
significant decrease in the incidence and severity of pruritus between the treatment and control groups at the 2-, 4-, 6-, 8- and 10-hour assessments (see Table).\textsuperscript{23}

The authors reported more sedation in the intervention group than in the control group. However, subjects in the treatment group were reportedly easy to wake up.\textsuperscript{23} Butorphanol has been detected in breast milk, but the levels were reported as minimal and “of no concern to a breastfeeding neonate.”\textsuperscript{2}

One group examined the effect of nalbuphine, 4 mg, given IV at the conclusion of surgery.\textsuperscript{16} There was a difference in the incidence of pruritus between nalbuphine (25%), ondansetron (4 mg, 47%; 8 mg, 51%), and placebo (72%) groups (P < .001). In the postanesthesia care unit (up to 4 hours after surgery) there was a difference in the pruritus severity scores between the groups, with 25% of subjects in the nalbuphine group reporting moderate pruritus compared with 28% in the ondansetron 4 mg group, 31% in the ondansetron 8 mg group, and 72% in the placebo group (P < .001). These differences were not observed at 8 and 24 hours after surgery. Two subjects in the treatment group required additional treatment with a pure opioid antagonist, naloxone.\textsuperscript{16}

- **Serotonin Receptor Antagonists.** Seven groups of investigators examined the efficacy of 5HT\textsubscript{3} antagonists in the prevention of pruritus.\textsuperscript{13,15,16,19,20,22,25} These agents are typically administered for the prevention and treatment of nausea and vomiting.\textsuperscript{13} Intravenous ondansetron was examined in doses of 4 mg,\textsuperscript{15,16,19,20,22} 8 mg,\textsuperscript{15,16,19,20,22} and 0.1 mg/kg\textsuperscript{13} (see Table). Four groups of researchers\textsuperscript{13,16,20,25} reported favorable results. For example, one group reported 85% incidence of pruritus in the placebo group vs 20% in the treatment group (P < .01),\textsuperscript{13} and another reported 88% incidence in the placebo group vs 16% in the treatment group (P < .001).\textsuperscript{25} Another group of researchers\textsuperscript{16} reported that a 4 mg dose of ondansetron was effective at preventing pruritus compared with a placebo up to 4 hours after surgery. Seventy-two percent of subjects receiving placebo experienced pruritus compared with 47% receiving 4 mg of ondansetron (P = .006).\textsuperscript{16}

Another group of investigators\textsuperscript{20} reported a statistically significant difference in the number of subjects in the ondansetron group who experienced pruritus between 4 and 12 hours after surgery (5.6%) compared with those receiving placebo (25%, P < .05).

Three groups of researchers reported that preventive treatment with ondansetron was ineffective.\textsuperscript{13,19,22} Two groups reported no significant difference in the incidence of pruritus between the treatment groups and the placebo groups (83.3% vs 86.6%\textsuperscript{22} and 76% vs 82%\textsuperscript{13}). Another group of authors reported a similar incidence of itching in the treatment group and the placebo group (23% and 31%, respectively).\textsuperscript{19}

Tropisetron is a 5HT\textsubscript{3} antagonist that has a longer half-life than ondansetron.\textsuperscript{19} This characteristic led investigators to hypothesize that tropisetron might be more effective in the prevention of pruritus caused by intrathecal opioids. However, investigators reported that tropisetron was ineffective in the prevention of pruritus, because the incidence of itching was 39% in the treatment group and 31% in the placebo group.\textsuperscript{19}

Granisetron has been reported to have a duration of action that coincides with the peak incidence of the pruritus from an intrathecal dose of opioid, and granisetron has a longer duration of action than ondansetron.\textsuperscript{22} However, the 3 mg dose of granisetron was ineffective in preventing pruritus. Authors reported that the incidence of pruritus was not significantly different for the treatment group (88%) than for the placebo group (86.6%).\textsuperscript{22}

- **GABA\textsubscript{A} Receptor Agonists.** A group of researchers who examined the efficacy of subhypnotic doses of propofol for the prevention of pruritus found no significant differences in the incidence of itching between the treatment group and the control group (62% vs 66%).\textsuperscript{12} The authors also reported no differences between the groups in the incidence of nausea.

A second group\textsuperscript{18} reported that a single dose of 20 mg of propofol yielded a significantly lower incidence of pruritus in the treatment group compared with the control group (number needed to treat [NNT] = 4.61; 95% CI = 4.45-4.77). This group reported a 16.7% incidence of somnolence in the treatment group during the perioperative period and a 5% incidence during the postoperative period. No other side effects were reported.\textsuperscript{18}

- **Antihistamines.** Promethazine and diphenhydramine are histamine (H\textsubscript{1}) receptor antagonists.\textsuperscript{3} Both provide sedation, but they have minimal effects on centrally mediated pruritus. Two groups of researchers\textsuperscript{13,18} examined the effectiveness of H\textsubscript{1} blockers on pruritus. One group reported that the incidence of pruritus among a group that received promethazine, 50 mg, was similar to the incidence of pruritus in the control group (87% and 95%, respectively).\textsuperscript{18}

Diphenhydramine also reportedly has little to no effect on pruritus caused by intrathecal opioids.\textsuperscript{13,27} For example, a group reported that the incidence of pruritus in a diphenhydramine group was 80%, not significantly different from the incidence in the control group (85%).\textsuperscript{13}

- **Dopamine Receptor Antagonists.** Alizapride is a D\textsubscript{2} receptor antagonist in the methoxybenzamide class (similar to metoclopramide). Investigators examined the effectiveness of a 100 mg IV dose of alizapride and droperidol 1.25 mg, which is also a D\textsubscript{2} antagonist.\textsuperscript{18} The authors reported that both the droperidol and alizapride groups showed significantly lower incidences of pruritus than did the placebo group. Droperidol was more effective for prevention of moderate and severe pruritus and yielded the lower NNT (3.52; 95% CI: 3.37-3.67) compared with alizapride (5.43; 95% CI: 5.27-5.59).\textsuperscript{18} The subjects in the droperidol group reported somnolence
more often (25%) than did subjects receiving alizapride (8.3%). Despite the possible propensity of droperidol to produce cardiac abnormalities, including prolonged QTc, no cardiac events were noted in this study. Droperidol is not widely available in the United States and is reportedly unavailable in other countries because of its reported effects on the heart.18

- **Corticosteroids.** One group of researchers examined the administration of 8 mg of dexamethasone.24 Dexamethasone is commonly used for the prevention of nausea and vomiting for patients receiving opioids. This group of authors reported that dexamethasone did not reduce the incidence of pruritus caused by intrathecal injection of meperidine. They did report, however, that the severity of pruritus was significantly less in the dexamethasone treatment group (10 subjects with mild pruritus and 0 with severe pruritus) than in the control group (7 subjects with mild pruritus and 6 with severe pruritus, $P = .019$).24

- **Nonsteroidal Anti-Inflammatory Drugs.** Investigators examined the efficacy of lornoxicam and celecoxib in preventing pruritus.17,20 NSAIDs are widely accepted as effective treatment of postoperative pain. Both groups of researchers reported that the incidence of pruritus was similar for the treatment group and the placebo group. For example, 1 group reported the incidence of pruritus was 30% in the treatment group and 33% in the placebo group.17 Both groups of authors theorized that a greater effect might have been observed if the treatment medications were used before, rather than after, the intrathecal opioid administration. However, the authors noted that regulations prohibit the treatment drug from being administered before delivery because of the effects on the fetus.17,20

**Conclusion**

Pruritus caused by intrathecal opioids is commonly reported as one of the most distressing complications experienced in the postpartum period.2 Thought to be caused by an interaction between opioids and the increased estrogen levels of pregnant and postpartum women, pruritus is reported to have an incidence as high as 100% for women receiving neuraxial opioids.4 In addition, the efficacy of ondansetron in preventing pruritus should continue to be explored.13,15,16,19,20,22,25 Most of the subjects in the studies included in this review received intrathecal morphine (solely or with another opioid).13-19,21-23 The effect of the intrathecal opioid on the incidence of pruritus in women undergoing cesarean delivery should be explored because this review concentrated on the effect of a single dose of medication to prevent pruritus.

More research is needed to address the prevention and treatment of this complication. Future studies using more consistent rating scales and similar dosing regimens across different classes of medication are needed. Larger, multicenter studies should improve the generalizability of the findings to potentially extend the prevention of this complication in patients who receive intrathecal opioids for nonobstetric surgical procedures.

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DISCLOSURES
The authors have declared no financial relationships with any commercial entity related to the content of this article. The authors did discuss off-label use within the article.