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ORIGINAL ARTICLE

Comparison Between Opioid Free Anesthesia and Opioid Based Anesthesia in Laparoscopic Hysterectomy: A Systematic Review

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Abstract

Introduction: In Gynecology field, laparoscopy surgery is used for many procedures that were traditionally performed via laparotomy. Hysterectomy associated with postoperative pain, which greatly affected postoperative recovery and patient satisfaction. Combinations of opiod base analgesia (OBA) and opioid free analgesia (OFA) agents are combined with local or regional anesthesic techniques whenever possible.

Methods: A systematic search of relevant databases was conducted to identify case control studies comparing OBA and OFA post hysterectomy procedure. Inclusion criteria encompassed studies reporting Visual Analog Scale (VAS) and Numeric Rating Scale (NRS) as an outcome measure. Quality assessment and data extraction were performed independently by author.

Results: The systematic review identified a total of four case-control studies meeting the inclusion criteria with total of 357 patients undergone hysterectomy procedure. The sample sizes varied across the studies, with the smallest study including 30 patients and the largest study including 157 patients. The outcomes were assessed using VAS and NRS scores. The results consistently showed that either OBA or OFA administration giving similar outcome on pain scale.

Conclusion: All studies concluded whether OBA or OFA administration peri or postoperative given similar or not significantly different of pain scoring outcomes. Although OFA would give a better result to maintain post operative nausea and vomitting (PONV) and reducing opiod-related adverse events that happen postoperatively.

Keywords: Hysterectomy, Opioid base analgesia (OBA), Opioid free analgesia (OFA), General Anesthesia, Pain score

Abstrak

Latar Belakang: Dalam bidang ginekologi, prosedur laparoskopi kini banyak digunakan untuk menggantikan teknik laparotomi konvensional. Histerektomi merupakan salah satu tindakan yang sering dikaitkan dengan nyeri pascaoperasi, yang secara signifikan memengaruhi proses pemulihan serta tingkat kepuasan pasien. Kombinasi antara analgesia berbasis opioid (OBA) dan analgesia tanpa opioid (OFA), yang disertai dengan teknik anestesi lokal maupun regional, diupayakan untuk digunakan sejauh memungkinkan.

Metode: Pencarian sistematis dilakukan pada berbagai basis data relevan untuk mengidentifikasi studi kasus-kontrol yang membandingkan efektivitas OBA dan OFA pada pasien pasca histerektomi. Kriteria inklusi mencakup studi yang melaporkan penggunaan Skala Visual Analog (VAS) dan Skala Penilaian Numerik (NRS) sebagai indikator hasil nyeri. Penilaian kualitas studi dan ekstraksi data dilakukan secara independen oleh penulis.

Hasil: Tinjauan sistematis ini mengidentifikasi empat studi kasus-kontrol yang memenuhi kriteria inklusi, dengan total 357 pasien yang menjalani prosedur histerektomi. Jumlah sampel bervariasi antar studi, dengan jumlah terkecil 30 pasien dan terbesar 157 pasien. Penilaian nyeri dilakukan menggunakan skor VAS dan NRS. Secara konsisten, hasil dari keempat studi menunjukkan bahwa pemberian OBA maupun OFA menghasilkan tingkat nyeri pascaoperasi yang serupa.

Kesimpulan: Seluruh studi yang ditinjau menyimpulkan bahwa penggunaan OBA maupun OFA, baik pada periode perioperatif maupun pascaoperatif, menghasilkan skor nyeri yang serupa atau tidak menunjukkan perbedaan yang bermakna secara statistik. Namun demikian, penggunaan OFA menunjukkan potensi yang lebih baik dalam mengendalikan mual dan muntah pascaoperasi (PONV) serta dalam mengurangi kejadian efek samping terkait opioid.

Kata Kunci : Histeretomi, Analgesia berbasis Opioid, Analgesia tanpa Opioid, Pembiusan Umum, Skor Nyeri

Introduction

In Gynecology field, laparoscopy surgery is used for many procedures that were traditionally performed via laparotomy. Procedure performed for benign and malignant diseases. Conventional and robotic approached are used. One procedure called Hysterectomy, uteral removal done using laparoscopy.[1]

According to United States national surveillance data, the laparoscopic mode of access has become the most common approach to hysterectomy, with a shift toward outpatient procedures. Additionally, laparoscopic surgery can be performed with conventional laparoscopic instruments or with computer assistance using robotic equipment and instruments.[2]

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Common indications for hysterectomy include uterine leimyomas, adenomyosis, abnormal uterine bleeding, endometriosis or uterine prolapse, also performed for uterine, ovarian, fallopian tube, peritoneal and cervical cancer. In some patients with gynecological cancer, surgical staging and treatment can be performed laparoscopically.[3,4]

Hysterectomy associated with postoperative pain, which highly affected postoperative recovery and patient satisfaction. The Enhanced Recovery After Surgery (ERAS) Society has published guidelines for perioperative care of patients undergoing hysterectomy, which cover the time from the decision to operate (starting with the 30 to 60 minutes before skin incision) to hospital discharge.[5]

Postoperative ERAS elements typically focus on pain management, bowel function, diet and patient mobilization. Patient undergoing gynecologic surgery for benign indications are typically expected to be discharged within one or two days following surgery.[5]

For postoperative management, the goal was to minimizing pain, mobilization and physical therapy. Combinations of OBA and OFA agents are administered along with local or regional anesthesic techniques are used whenever possible.[6]

The aim of this systematic review was to compare between the use of OBA and OFA administration for patient undergone gynecological procedure based on pain scoring and their satisfaction

Methods

Eligibility criteria

We included all studies comparing OBA versus OFA in postoperative Gynecological procedure, specifically hysterectomy using laparoscopy procedure; included pain score outcomes, VAS and NRS; and full text of studies available. The exclusion criteria were the following: other studies design : letters, comments, case reports, reviews, animal studies, cadaveric studies, biomechanical studies, and study protocols; only abstract available; duplicated studies and data. The outcome of interest in this study was VAS and NRS post procedure.

Search strategy

We searched systematically using the keywords Opioid AND Free AND Anesthesia AND (Gynecological Procedure OR Hysterectomy) in the MEDLINE, CENTRAL, and EMBASE databases to find eligible studies. The authors performed the study selection process to reduce the possibility of discarding relevant studies. Duplicate records were removed. Titles and abstracts were screened, and irrelevant studies were removed. Studies that passed the first screening were further evaluated for compliance with this review's inclusion and exclusion criteria. Limited to the last 10 years of publication. Articles were included if they

reported data on clinical and functional outcomes and complications especially studies which compared OBA and OFA. Finally, the studies were further evaluated for their quality before being included in this review.

Data items

The data items were author's name, year of publication, time frame, sample size, intervention, surgery, postoperative medication, outcome of interest (pain scoring) and its results.

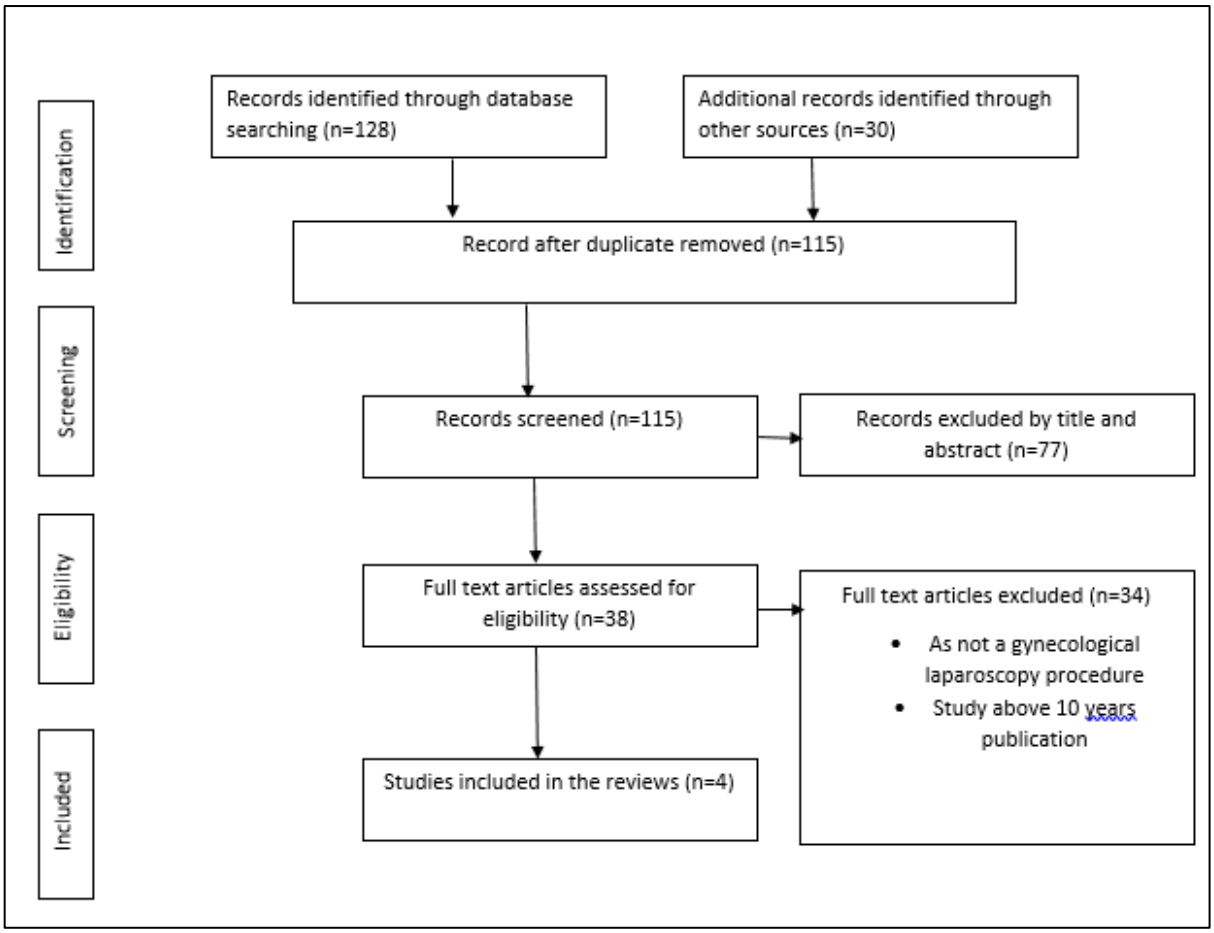

Figure 1. Flow diagram based on the PRISMA (Preferred Reporting Items for Systematic Meta-Analyses) guidelines outlining the literature search, screening, and review.

Table 1. Study Characteristics

Study	Time frame	Sample size	Intervention	Surgey	Postoperative Medication	Outcome of interest	Results
Choi et al, 2016	Not specified	90	Comparison of fentanyl, remifentanyl and dexmedetomidine	Laparoscopic Hysterectomy	N/A	VAS Score postoperatively	VAS score of post-80 pain was not significantly different among three group
Gazi et al, 2018	March 2016 to September 2016	30	Comparison of remifentanil and dexmedetomidine	Hysterectomy	N/A	VAS Score postoperatively	No differences were found in postoperative scores
Hakim et al, 2019	December 2017 to January 2019	80	Comparison of dexmedetomidine with fentanyl	Ambulatory gynecologic laparsocopy	Tramadol	QoR 24 hours postoperatively	The QoR was statistically significantly higher in the OF group
Massoth et al, 2021	January 2019 to August 2020	157	Comparison of dexemedetomidine, esketamine and sevoflurane to sufentanil and sevoflurane	Gynecological laparsocopy	Morphine	1) Postoperative NRS scores 2) Postoperative Morphine consumption	1) The median NRS on arrival at the PACU was 4 in the control group and 4 in the opioid group and continued to be not significantly different after 15 min, after 30 min and at discharge from PACU 2) Median morphine consumption at 1 h postoperatively was 6.0 mg (4.0-9.8) in the control group and 6.0 mg (4.0-9.0) in the opioid free group (p = 0.95) and was not significantly different at 2 h

[a]Data are presented in M ± SD.
[ˇ]Study quality was assessed with the Newcastle-Ottawa Scale for case-control studies (good, fair, or poor) and the revised Cochrane risk-of- bias tool for randomized trials (low or high risk of bias).

Assessment of quality of study

Studies that complied with inclusion and exclusion criteria were assessed for their quality. The overall quality of evidence for retrospective case-control was graded according to the Newcastle-Ottawa Scale (NOS) guidelines. The quality of evidence for the 4 case-control studies was considered good according to the NOS. Ensure the studies' validity and reliability.

Results

All the included studies have patients whom done gynaecological laparoscopy (dominantly hysterectomy laparoscopy) procedure that were treated with OBA compared with OFA postoperatively. The outcomes were assessed using 2 pain scale scoring, either with VAS or NRS. One study showed that the median NRS on arrival at the PACU was 4 in the control group and 4 in the opioid group and continued to be not significantly different after 15 minutes, after 30 minutes and at discharge from the PACU. NRS Scores assessed on the ward at the day of operation 3.0 (2.0-5.0); p=0.77 and the first postoperative day 2.0 (1.0-4.0) vs 3.0 (1.25-4.0); p=0.8 were comparable on both groups. In other study, OFA was showed having a better maximum NRS score in the first 24 hours postoperative in OFA group with 3 compared with OBA group with 4 (3 (2-5) vs 4 (2-6) p=0.02). Other study which compared the use of dexmedetomidine compared with fentanyl and remifentanil at sedative doses showed lower Systolic Blood Pressure, Diastolic Blood Pressure and Heart Rate significant in dexmedetomidine compared than two other group even though VAS scores of post operative pain were not significantly different among the three groups. Which also in line with another study that compare the use of dexmedetomidine and remifentanil on pain scale post operative in hysterectomy procedure, the study conclude that VAS score was similar on both group.

Discussion

The studies included in the discussion provide both OBA and OFA agents comparison that used post gynaecological laparoscopy gave result in pain scale scoring (both VAS nor NRS)

One study by Massoth et al compared the outcomes of OBA and OFA used post procedure in 152 patients undergone hysterectomy laparoscopy. The study found that the median NRS on arrival at the PACU was 4 in the control group and 4 in the opioid group and continued to be not significantly different after 15 min, after 30 min and at discharge from the PACU. NRS Scores assessed on the ward at the day of operation (3.0 (2.0–5.0); p =0.77) and the first postoperative day (2.0 (1.0–4.0) vs. 3.0 (1.25–4.0); p =0.8) were comparable in both groups.[7]

Hakim et al conducted a randomized control study comparing Total Intravenous Anesthesia (TIVA) with OF and opiod base agents in 80 female undergoing gynaecological laparoscopy which concluded that NRS, time of first analgesia, and number of rescue analgesia required, there was a statistically significant difference between the two studied groups where Opioid group was higher than OF group ($P < 0.05$).[8]

Choi et al conducted a randomized double-blind study involving 90 female patients undergone laparoscopic total hysterectomy which divided into 3 groups which given Dexmedetomidine, Remifentanil and Fentanil which VAS scores were not significantly different among groups.[9]

Gazi et al also compared the effects of dexmedetomidine and remifentanil in 30 patients undergone hysterescopies showed similar result of VAS score.[10]

NRS or VAS scores are most widely used in clinical studies to compare the outcomes between given procedure or medication. As in

these studies, no clinical difference in pain outcomes, the choice of OFA usage depends more on adverse events and safely proven alternatives. In light of the known adverse events of opioids in both the intraoperative and post-acute postoperative phases of care, there have been concerted efforts to reduce opioid exposures.[11]

One retrospective cohort study that included more than one million surgical procedures noted that clinician, hospital and patient-related factors contributed to substantial variability in intraoperative opioid administration and dosing. Evidence supports the analgesic efficacy of OFA, although still underutilized in clinical practice.[11,12]

Growing concern that higher doses of perioperative opioids may contribute to persistent postoperative opioids may contribute to persistent postoperative opioid use and greater risk of dependence, addiction, and overdose has led some clinicians to advocate for OFA.[13]

A 2019 systematic review of randomized trials investigating use of intraoperative opioid administration compared with other analgesic agents or placebo found that pain scores were equivalent in opioid based versus opioid free groups, although the incidence of PONV was lower in the opioid free group (risk ratio (RR) 0.78, 95% CI 0.61-0.97;1304 patients, 23 trials).[13,14]

However, controversy exists regarding whether OFA is necessary or even feasible, for most surgical case. Aside from reducing PONV, there is paucity of data to support use of opioid free anesthetic in attemptsto alter short or long-term postoperative outcome.[15]
Furthermore, inadequate treatment of pain carries its own risks; thus, effective analgesia is a primary goal of the anestesiologist.

Conclusion

All studies concluded whether OBA or OFA administration peri or postoperative given similar or not significantly different of pain scoring outcomes. Although OFA would give a better result to maintain PONV and reducing opiod adverse event that happes postoperative. However, as the review also emphasizes the need for further high-quality research, the present findings offer a compelling foundation for future investigations aimed at refining the use of OFA in clinical practice based on reducing opioid adverse event.

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Conflict of Interest

The authors declare no conflict of interest in the preparation of this manuscript.

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