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A Comparison of Total Intravenous Anesthesia Plus Intravenous Paracetamol with Local Anesthesia Plus Meperidine in Outpatient Breast Surgeries in Iranian General Hospital Since March 2010 up to August 2011

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Abstract

Background: Air and saline are commonly used in the loss-of-resistance technique to identify the epidural space. However, it is unclear which method promotes more effective analgesic delivery after subsequent epidural catheter placement.

Methods: We conducted a meta-analysis to determine the efficacy of air and saline identification methods. We performed a systematic literature search of the National Library of Medicine's PubMed database using terms related to air, saline, epidural, and loss of resistance. Only randomized controlled trials that compared air with saline or local anesthetic were included for analysis. No restrictions were placed on the language of identified articles. Data on pertinent study characteristics and relevant outcomes were extracted from accepted articles. A random effects model was used..

Results: The literature search yielded six articles that met all inclusion criteria. A review of the articles reveal 515 subjects for whom air had been used to identify the epidural space and 522 for whom liquid had been used. We were able to obtain pooled estimates for unblocked segments, need for additional medications, and replaced catheters. Use of air was associated with an increased risk for unblocked segments [relative risk (RR) = 2.12, 95% confidence interval (CI): 1.07, 4.21; p = 0.03], but there was no difference with regard to replaced catheters [RR = 0.69, 95% CI: 0.26, 1.82; p = 0.45] or additional medication [RR = 1.59, 95% CI: 0.85, 2.41; p = 0.18].

Conclusion: Our pooled analysis revealed that use of air in the loss-of-resistance technique results in decreased analgesia in one parameter (unblocked segments) but not others (additional medications, replaced catheters). The results should be interpreted with caution, and additional examination with a larger randomized controlled trial is warranted, as the overall number of subjects was relatively small.

Introduction

Ambulatory breast surgeries are among popular outpatient procedures due to high incidence of breast disease in young and middle age women [1-4], there have been attempts to develop a safe anesthetic technique that facilitates early ambulation to keep the high turnover rate of outpatient operating room and minimize the PACU admission of patients after these procedures [5]. General anesthesia with Propofol and Remifentanil has already known as method of choice for ambulatory surgical procedures due to its short acting effects and fewer complications [6,7], this method usually needs airway management by endotracheal intubation or laryngeal mask airway (LMA) that might be associated with side effects of airway instrumentation [8-12]. Although the quality provided by local anesthesia is unsatisfactory due to discomfort and possibility of painful experiences it offers the advantage of patient breathing spontaneously, being oriented and awake; also it has the advantage of rapid recovery and avoiding the need of prolong PACU staying. The most benefit of employing local anesthesia is its superiority in controlling post operation pain comparing with general anesthesia [13-19]. Opioids are common analgesic drugs using during operation and in post operation period but because of their side effects including nausea, vomiting and respiratory depression, their use in ambulatory procedures is being limited, this is because of that nowadays safer modalities are available. Paracetamol, intravenous acetaminophen, is an acceptable analgesic agent which has no significant side effect since 1985 up to this time [20-24]. There are many articles that suggest use of paracetamol instead of Opioids for pain management in ambulatory procedures [24-27]. In this study we have compare two common anesthesia methods, TIVA and local anesthesia plus sedation, to find out which strategy might be more useful considering more patient's comfort and less side effects, beside shorter PACU period.

Patients and Methods

This is a comparative clinical trial conducted on 140 women undergoing outpatient breast surgeries in Imam Khomeini Hospital during March 2010 to August 2011. All the patients were young and middle age women, between 27-62 years old, without any underlying systemic disorder. Twenty eight (20%) of total study group, (20%) fourteen in each group were smoker, less than 2 pack-years. They were scheduled for ambulatory breast surgery by a general surgeon. All

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these patients were visited in preoperational period by anesthesiologist and after informing about the study ethical consents sheets were signed by them. They were admitted as outpatients in operating room with complete fasting time recommended by anesthesiologist. No premedication was administered to either of each patient.

The patients were randomized incidentally in two equal groups, each containing 70 members age matched; the study was double blinded because neither the patient, nor the anesthetist nurse who collected the data was aware of the method of anesthesia. First group were receiving Propofol $5\mu g/mL$ (typically a Continuous infusion rate $100\mu g/kg/min$) plus Remifentanil $0.05\mu/kg/min$ as maintenance of anesthesia, airway management was done by laryngeal mask LMA, and 20 mg Atracurrium was administered for LMA insertion if needed, at the final ten minutes of the surgical procedure these patients received 1 gr paracetamol which was continued up to first twenty minutes of recovery period. The second group undergone local anesthetic infiltration by surgeon and received sedation with midazolam 2.5mg. Meperidine 25mgwas also administered as an analgesic by repeated 10 mg doses, if needed intermittently during the procedure and in recovery period.

In PACU when the patients were fullyawake with stable vital signs a numerical pain scale was recorded, including 0: no pain, 1-3: mild pain, 4-6: moderate pain and 7-10: sever pain. The questionnaire was filled by an anesthetist nurse who was not informed about the anesthesia plan of each patient. The patients were discharged from PACU when they were fully awake, with stable vital signs; when no complaint of dizziness was presented or no orthostatic hypotension was detected. In PACU, Heart Rate, Blood Pressure, Mean Arterial Blood Pressure, patient's and surgeon's satisfaction, pain score after recovery, need for adjuvant analgesia, nausea and vomiting and duration of PACU staying were recorded. The age of the patients was also recorded. The whole time of recovery period was documented for each patient as a dependent variable in the questionnaire. All Patients who participated had not any payment for treatment drugs, and also we didn't impose any additional treatment cost to them. All the data was analyzed by SPSS software version16 by employing T-Test comparing two groups.

Results

The mean age was 39.00 ± 12.16 years in (TIVA, Pc) and 41.69 ± 14.29 years in (LA+ Mep). There was no statistically significant difference between mean age of two groups (P: 0.2), Mean Systolic

Blood Pressure (P: 0.5), Heart Rate (P: 0.8) and pain score before administering paracetamol (P: 0.1). The mean pain score was different after Paracetamol infusion in recovery (P: 0.003). The need for neuromuscular blockers (NMB) and the need for reverse of neuromuscular blockers (RNMB) were significant in (TIVA, Pc) but no adverse effects were detected in patients receiving these agents. Orthostatic blood pressure changes and complaint of dizziness were more in (LA+ Mep) P value: (0.05) and (0.01) respectively. Both group needed to receive analgesic agents in recovery and differences between demands of each group for analgesics was statistically insignificant. (P: 0.001). There were no differences in the incidence of nausea and vomiting in both groups. Patient's satisfaction was 37.9% and 46.4% in (LA+Mep) and (TIVA, Pc) respectively (P: 0.05). Being tired due to immobility during the procedure and intermittent experience of pain were the causes of the patient's unpleasant in (LA+Mep). Among the patients who received TIVA the chief unsatisfactory complaint was that they thought if they weren't generally anesthetized they wouldn't experience any episodes of nausea and vomiting. Surgeon's satisfaction was 40.7% in (LA+Mep) and 46.4% in (TIVA, Pc) (P: 0.04), he preferred the immobility of patients in (TIVA, Pc). The period of PACU staying was 82.91±29.2minutes for (LA+Mep) and 69.70±42.8minutes for (TIVA, Pc) (P: 0.035).

Discussion

Ambulatory breast surgeries are among popular outpatient procedures due to high incidence of breast disease in young and middle age women [1-4], so achieving appropriate anesthesia planning is necessary to keep the high turnover rate of outpatient operating room and minimize the PACU admission of patients [5]. General anesthesia with Propofol and Remifentanil has been already known as a method of choice for ambulatory surgical procedures due to its short acting effects and fewer complications [6,7], this method usually needs airway management by endotracheal intubation or laryngeal mask airway (LMA) that might be associated with side effects of airway instrumentation[8-12]. Although the quality provided by local anesthesia is unsatisfactory due to discomfort and possibility of painful experiences it offers the advantage of breathing spontaneously, being oriented and awake; also it has the advantage of rapid recovery and avoiding the need of prolong PACU staying. The most benefit of employing local anesthesia is its superiority in controlling post operation pain comparing with general anesthesia [13-19]. The main

Parameter Group	Diastolic BP mmHg	MAP mmHg	SBP mmHg	Heart rate Beat/minute	Pain Score before recovery	Pain Score after recovery
(LA+ Mep)	63.72±43.07	75.96±6.06	127.46±11.02	70.63±12.09	4.39±1.87	3.27±1.78
(TIVA, Pc)	54.30±24.56	76.34±5.95	126.33±10.79	71.07±10.91	4.83±1.71	2.46±1.40
MEAN	59.01±35.25	76.15±5.99	126.89±10.88	70.85±11.47	4.61±1.80	2.86±1.65

Table 1: hemodynamic parameters.

group	parameters	Needed for analgesic	dizziness	Orthostatic hypoten- sion	vomiting	nausea
	Number*	20	20	11	2	7
(LA+ Mep)	percent	14.3%	14.3%	7.9%	1.4%	5.0%
	Number	0	8	4	0	3
(TIVA, Pc)	percent	.0%	5.7%	2.9%	.0%	2.1%
mean	Number	20	28	15	2	10
	percent	14.3%	20.0%	10.7%	1.4%	7.1%
P value		0.001	0.01	0.05	0.1	0.1

This is number of patients among 70, in each group.

 Table 2: the incidence of side effects and needed for adjuvant analgesia.

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purpose of this comparative clinical trial was to find out if local anesthesia and sedation is a better choice than general anesthesia with TIVA for maintenance of the anesthesia in ambulatory breast surgeries. According to the result achieved in this study there are disadvantages other than patient's discomfort and pain in local anesthesia and sedation technique which can even prolong patients PACU staying or post operation hospitalization that is undesirable situation for outpatient breast surgeries. We detected higher incidence of dizziness (P: 0.01) and orthostatic hypotension (P: 0.05) in the patients who received local anesthesia and meperidine, we also recorded more needed for analgesic agents in PACU among this group compared with (TIVA+ Pc) (P: 0.001). The duration of recovery was longer in (LA+Mep) (P: 0.035).

Also the patients and the surgeon were less satisfied in (LA+Mep) P value: (0.05) and (0.04) respectively. This study purposes that side effects of local anesthesia and sedation should be considered when planning anesthesia to reduce undesirable outcomes which may induce patient's dissatisfaction in ambulatory breast surgeries; the patients prefer methods of anesthesia with no incidence of experiencing pain during the procedure, they also prefer to be deeply sedated than staying long period immobile during the operation. In recovery any adverse effect including orthostatic hypotension, dizziness, pain, nausea and vomiting is of great significance for the patients and may prolong the recovery. They prefer shorter recovery with less discomfort. Surgeon needs patient's immobility during the procedure and it is very important for him. Opioids are common analgesic drugs using during operations and in post operation periods but because of their side effects including nausea and vomiting and respiratory depression, their use in ambulatory procedures is being limited, this is because of that nowadays safer modalities are available [20-24]. Paracetamol, intravenous acetaminophen, is an acceptable analgesic agent which has no significant side effect since 1985 up to this time [20-24]. There are many articles that suggest use paracetamol instead of Opioids for pain management in ambulatory procedures [24]. In our study we used this agent for post operation pain management in TIVA method and comparing with Meperidine it showed more beneficial effects.

Conclusion

Considering all advantages discussed about, including more patient's comfort and less side effects plus shorter PACU period, this study establishes that in ambulatory breast surgeries anesthesia with TIVA is more beneficial than local anesthesia and sedation, especially when paracetamol is administered for post operation pain management. Further studies are needed to address the results in other outpatient procedures.

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