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ORIGINAL ARTICLE

Comparison of effects of 5% Lidocaine and 5% Meperidine plus 5% Lidocaine on complications and duration of postoperative analgesia for cesarean section

Malihe Zanguoie[1], Mahboobe Zanguoie[2], Reza Zanguoie[3], Maryam Tolyat[4]✉

[1] *Assistant professor, Department of Anesthesiology, Faculty of Medicine, Birjand University of Medical Sciences, Birjand, Iran;*

[2] *Assistant professor, Department of Obstetrics and Gynecology, faculty of Medicine, Birjand University of Medical Sciences, Birjand, Iran;*

[3] *Pharmacologist and academic staff of Azad University of Medical Science, Birjand, Iran;*

[4] *Instructor, Department of Operating Room, Faculty of Medicine, Birjand University of Medical Sciences, Birjand, Iran.*

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Abstract

Introduction: Nowadays, spinal anesthesia is associated with few complications in many surgical practices especially the elective caesarean which is taken as a suitable replacement for general anesthesia. Different drugs are used for spinal anesthesia. This study aims to compare lidocaine 5% in combination with meperidine 5% plus lidocaine 5% for spinal anesthesia in non-emergency cesarean patients.

Methods: This is a double-blind clinical trial that Was performed on fifty full term pregnant women, physical status I or II, presenting for non-emergency cesarean section under spinal anesthesia were randomly divided into two groups with 25 in each. All patient received IV 15 ml/kg Ringers solution 15 minutes prior to block. For spinal anesthesia, patients were given either 5% Meperidine 1.25 mg/kg or 5% heavy Lidocaine 60-75 mg intrathecally. The sensory blockade in all except two patients in Lidocaine group and one patient in Meperidine group, who required sedation and analgesia during surgery, was adequate for cesarean section. Data were analyzed by spss software.

Results: Post-operation analgesia duration was 342.5±18.5 minutes in the lidocaine plus meperidine group and was 131.6±15 minutes in the lidocaine group. The mean difference of blood pressure before and 15 min after blockage was not significant in the lidocaine group and lidocaine plus meperidine group.

Conclusions: It seems that lidocaine-meperidine combination has stronger medical effects than lidocaine used alone. Besides, the combination can be a proper drug for spinal anesthesia given the longer analgesia duration and lack of significant complications for the patient or adverse effects on the baby.

Key Words: Cesarean; Lidocaine; Mepridine; Spinal anesthesia

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Birjand University of Medical Sciences
Journal Office, Ghaffari Ave., Birjand,
I.R. Iran
Tel: +985632443041 (5533)
Fax: +985632440488
Po Box 97175-379
Email: jsurgery@bums.ac.ir

✉**Correspondence to:**
Maryam Tolyat, Instructor, Department of Operating Room,
Faculty of Medicine, Birjand University of Medical Sciences,
Birjand, Iran;
Telephone Number: +989153618533
Email Address: tolyatm@yahoo.com

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Introduction

Caesarean is a common surgical practice among women with an annual record of around one million cases. Approximately, 19-26% of pregnancies end in caesarean. In recent years, caesarean has been on the rise across the world, and the practice in Iran overrides many other parts of the world in number of occurrence [1]. For candidates of the caesarean section, either the general anesthesia or spinal anesthesia is used [2]. Regional anesthesia (epidural and spinal) is the elective caesarean approach [3].

Taken as a suitable replacement for general anesthesia, spinal anesthesia is associated with few complications in many surgical practices especially the elective caesarean. It is a common technique because it is simple, reliable, and fast enough for adequate anesthesia. Spinal anesthesia has gained interest since the parturient is conscious, baby's depression is to the minimum, and complications of general anesthesia and intubation are avoided. Among the disadvantages of classical spinal anesthesia (with local anesthetic drugs) include homodynamic disorders such as hypotension and short-time post-caesarean section delivery analgesia [4, 5]. Different drugs are used for spinal anesthesia including lidocaine, bupivacaine, or tetracaine. These drugs are locally used and result in such complications as decreased pulse and blood pressure because of sympathetic block [6, 7]. Pethidine (meperinde) is among opiums and has been used as an anesthetic drug for different purposes in recent years because of structural similarities with local anesthesia; it is also the most common opium used in midwifery [8-13].

The intrathecal infusion of opiums such as pethidine for surgical practice has been studied by different researchers. All of the studies have found pethidine an effective drug with limited and curable complications such as hypotension, pruritus, nausea, and vomiting [13-18].

Since there are scarce reports about its solitary application in spinal anesthesia for caesarean, the present study aims to compare the effects of pethidine-lidocaine combination and 5% lidocaine solitary application on post-surgical complications and hypotension.

Methods

This is a double-blind clinical trial in which the participants included women of anesthesia classes I and II who had to go through caesarean section for non-emergency reasons such as elective caesarean, previous caesarean, non-advancement of delivery, cephalopelvic disproportion, or incomplete presentation. The required sample size was calculated according to Kafel study (1993)[7] and decided as 25 individuals in each group. The objectives of the study were explained to the participants who then provided informed consent. Upon gradual visits, qualified patients were selected through convenience sampling, and were then randomly allocated to either of the two groups. The groups included a lidocaine (5%) plus meperidine (5%) group and the solitarily-used lidocaine (5%) group. Within 30 minutes, each of the patients received 15 ml/kg ringer solution 15 minutes prior to blockage and 10 mg metoclopramide intravenously upon entrance to the operation room. For spinal anesthesia, patients were given either 5% Meperidine 1.25 mg/kg or 5% heavy Lidocaine 60-75 mg intrathecally. The sensory blockade in all except two patients in Lidocaine group and one patient in Meperidine group, who required sedation and analgesia during surgery, was adequate for cesarean section. The blood pressure was controlled by a mercury sphygmomanometer before blockage and every five minutes along with the operation. It continued until the operation was finished and any incidence of hypotension (the systolic pressure below 90mmHg with a decrease in systolic pressure above 30% of baseline) was recorded.

Patient's SPO2 was monitored by pulse oximeter and recorded every five minutes from the beginning of blockage to the exit of the recovery room. Apgar score was calculated and recorded at 1 and 5 minutes after delivery. The patient was monitored in the recovery room after the operation until the sensory and motor blockage disappeared and the patient was moved from the recovery room. The time pain started and requirement of painreleas injection were accurately recorded. Thus, the time between subaracnoid injection in operation room and painreleas injection were calculated and recorded as a painless duration. Nausea, vomiting, pruritus, hypoxia (SPO2<90%) and dyspnea were checked during the operation. The personnel who recorded the indices as well as the patients were unaware of the type of injection drug. After being measured by refractor specific for measuring urine specific gravity, the specific gravity of meperidine 5% was 1.03 in room temperature which is hyperbaric as compared with the specific gravity of CSF mentioned in reference books as 1.003-1.009.

Descriptive statistics were used to describe the data and the indices such as mean, standard deviation, frequency, and percentage. T test compared the mean of variables such as analgesia

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duration and age, and qui-square was used to compare frequency distribution of qualitative variables including nausea, vomiting, pruritus, and dyspnea. The significant level was 0.05, and the data were analyzed in SPSS.

Results

In this study, 50 candidates for caesarean using spinal anesthesia participated. The mean of age in lidocaine plus meperidine group was 22.3±7.8, and in the lidocaine group, it was 21.2±6.2 years (p>0/05). Weight mean in the lidocaine plus meperidine group was 58.3±7.5, and in the lidocaine group, it was 60.3±7.8 kg (p>0.05).

As Table 1 shows, post-operation analgesia duration was 342.5±18.5 minutes in the lidocaine plus meperidine group and 131.6±15 minutes in the lidocaine group. The mean difference of blood pressure before and 15 min after blockage was not significant in the lidocaine group and lidocaine plus meperidine group. (p>0.05) No respiratory depression was observed in the babies born in either of the groups.

No instance of hypoxia and urine retention was observed in two groups. Also, there are not significant differences in hypotension, nausea and vomiting, pruritus, and dyspnea between two groups (Table 2).

Table 1: Comparison of analgesia duration and systolic and diastolic pressure difference mean before and 15 min after blockage in both groups

Variable	Group				P-value
	Lidocaine plus meperidine		Lidocaine		
	Mean	Standard deviation	Mean	Standard deviation	
Analgesia duration (min)	342.5	18.5	131.3	15	0.0001
Systolic pressure difference mean before and 15 min after blockage (mmHg)	0.8	0.5	0.9	0.6	0.236
Diastolic pressure difference mean before and 15 min after blockage (mmHg)	0.6	0.4	0.4	0.3	0.461

Table 2: Comparison of frequency of side effects in study participants in both groups

Variable	Group						P-value
	Lidocaine plus meperidine		Lidocaine		Total		
	No.	Percentage	No.	Percentage	No.	Percentage	
Nausea and vomit	13	52	7	28	20	80	0.08
Hypotension	3	12	4	16	7	28	0.68
Pruritus	4	16	4	16	8	32	1
Dyspnea	4	16	6	24	10	49	0.48

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Discussion

In this study, the analgesia duration in the lidocaine plus meperidine group was longer than in the solitarily used lidocaine group. However, there was no significant difference between the groups in terms of hypotension before and after the intervention. Such complications as nausea, vomiting, and dyspnea were more in the lidocaine-meperidine group than in the lidocaine group, although the difference was not significant. And also in Katie study the incidence of nausea , dyspnea and vomiting been higher in meperidine group, and Pruritus occurred in eight patients (32%) in the meperidine group, although it did not require treatment and disappeared spontaneously during the course of surgery.

No respiratory depression was observed in the babies born in either of the groups. This has not been reported in other studies either, which might be because of lidocaine's high tendency towards adipose tissue and because of the special weight of lidocaine (5%) that put it in hyperbaric class vis-à-vis CSF (cerebrospinal fluid)[19].

The long duration of analgesia in lidocaine plus meperidine group in this study is an advantage of pethidine; this finding is in line with Yusc's study (2002) and Lak's study [19] where lidocaine has lengthened the analgesia duration [20, 21]. Lidocaine-meperidine combination has been reported in other studies to be with a longer analgesia effect than the solitarily used lidocaine where the mean duration of analgesia has been approximately 400 minutes – a time span close to our findings [19-21]. In Neganki study, different doses of meperidine were studied, and different doses had similar effects in terms of analgesia duration, also 5 mg/ml dose was suggested as the best dose because of the side effects of higher doses [22]. In our study, were given either 5% Meperidine 1.25 mg/kg intrathecally.

In our study, differences in systolic and diastolic blood pressures before and after drug infusion were not significant in both groups. Other studies have not determined a significant difference in hypotension using pethidine [18]. Given the least change in systolic blood pressure before and after drug injection, the combination of lidocaine and meperidine is more appropriate than lidocaine solitarily used.

Conclusions

It seems that lidocaine-meperidine combination has stronger medical effects than lidocaine used alone. Beside that, the combination can be a proper drug for spinal anesthesia given the longer analgesia duration and lack of significant complications for the patient or adverse effects on the baby's Apgar.

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