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Investigation of the Effect of Local Anesthesia Application on the İncision Line on Patient Comfort in Patients Who Underwent Pfannestiel İncision-Prospective Case-Control Study

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ABSTRACT

AİM: It was aimed to investigate the effect of local anesthetic application on the Pfannenstiel incision line on patient comfort.

METHODS: The study was carried out between 2021 and 2022. It was performed on 240 patients. The patients were categorized as Group 1 in which a local anesthetic was administered and Group 2, which was not administered a local anesthetic. It was performed on 120 hysterectomy cases operated under general anesthesia. 5 mg 0.5% bupivacaine was used as a local anesthetic. The patients were evaluated in terms of postoperative pain score, gas-gaita release time, postoperative mobilization, narcotic analgesic requirement, post-operative home comfort, daily return to basic work, and feeling like they used to be. For statistical analysis, SPSS Version 28.0.1 program was used.

RESULTS: A statistically significant decrease was observed in postoperative 2nd-hour pain scores in Group 1 patients compared to Group 2 (p=0.007). A statistically significant decrease was found in the need for narcotic analgesics in Group 1 patients (p=0.04). Gas-stool release time was shorter in Group 1 patients compared to Group 2, and it was statistically significant (p=0.038). Mobilization was easier in the 1st group of patients and it was found to be statistically significant compared to the 2nd group (p=0.004). In other parameters, there was no difference between the two groups.

CONCLUSİON: Applying local anesthesia to the incision site reduces pain in the first 2 hours postoperatively, earlier gas-gaita output, comfortable mobilization, and a decrease in the need for narcotic analgesics.

KEYWORDS: pfannenstiel ıncision, local anesthesia, postoperative pain, pain control

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İNTRODUCTİON

Pain comes from the Latin word "poena" (punishment) and has been defined in many different ways until today. According to the definition made by the International Association for the Study of Pain (IASP) in 1979; Pain may or may not be accompanied by tissue damage. It is defined as a subjective, primitive, sensory, unpleasant emotional sensation and behavior pattern that a person has acquired in the past, originating from a certain part of the body (1,2). Despite the presence of both new methods and new drugs for the control of postoperative pain in the last twenty years, the inadequacy of treatment continues. Among the reasons for this; Lack of pharmacological knowledge about drugs, fear of side effects of opioid drugs, such as respiratory depression, tolerance or dependence, and lack of knowledge and skills about new techniques can be counted (3). Physicians and nurses generally approach pain, not by eliminating the pain, but by partially reducing it. The reason for this is that they evaluate postoperative pain as a natural result of the operation and a necessity that must be suffered or endured. However, today, in the treatment of postoperative pain, adequate analgesia can be provided in many patients with the use of new techniques developed (4). Studies show that 30-70% of patients experience serious pain in the postoperative period (5). Local analgesia is preceded by many in-office procedures such as biopsies, toenail removal, and laceration repair. Skin procedures are performed most commonly (6). Local anesthetics are drugs that block the impulse transmission in

nerve fibers when they come into contact with the appropriate concentration, and they dose-dependently affect not only the nerve fiber membrane but also all excitable cell membranes. (7). Local anesthetic infiltration reduces post-surgical pain (8-12). There are many studies on pain control and safety in the use of local anesthetics in laparoscopic gynecological surgery (13-15). In our study, we aimed to investigate the contribution of local anesthesia to the operation area to postoperative pain control. In addition, the parameters of mobilization, gas-gaita exit times, home comfort, doing basic work, and feeling like before were also examined. We hope that our study will contribute to the literature on postoperative pain control.

OBJECTİVE

Our study aimed to evaluate the pain status of patients who were administered local anesthesia. It is aimed to evaluate postoperative mobilization, gas-gaita output, and narcotic analgesic needs. Again, it was aimed to investigate the comfort of home, the ability to do basic work, and recovery times after discharge in patients.

MATERİALS and METHODS

Type of Research

Our research was designed as a prospective case-control study.

Research Location and Time

The research was carried out between 01.05.2021 and 01.12.2022. The research was carried out in Muğla Ortaca Yücelen Hospital Gynecology and Obstetrics Clinic, Uşak Training and Research Hospital Gynecology and Obstetrics Clinic, and Iğdır State Hospital.

Population and Sample of the Research

The study was designed for patients over 18 years of age. Patients who were operated on with a Pfannenstiel incision were included in the study. American Society of Anesthesiology According to (ASA) classification I-II. patients in the group's written consent were obtained before the surgery and the study was they are informed about. Those who have ASA-III and above and those who were allergic to local anesthetics were not included in the study. Patients with chronic pain syndrome were excluded from the study. Patients who were socially and mentally unsuitable for the study were excluded from the study. To avoid possible confusion, patients who operated under general anesthesia were included in the study. The study was designed for 134 patients. However, 8 patients did not want to participate in the study. It was removed because complications developed in 4 patients. Since 2 patients had a history of an allergic reaction, they were not included in the study. For the control group, 120 patients who met the selection criteria were randomly selected.

Research Design

Patients were evaluated in terms of age, obstetric history, body mass index,(BMI), and demographic characteristics. Patients who were operated on with a Pfannenstiel incision were divided into two groups. The patients in the first group were included in the incision line as the patients who underwent local anesthesia. Epidural anesthesia was not used in patients because it did not affect the evaluation of local anesthesia. The second group of patients was included in the incision line as patients who were not given local anesthesia. The study was conducted with 240 patients, 120 patients in the first group and 120 patients in the second group. The 2nd group of patients who did not receive local anesthesia was taken as the control group. Patients were questioned for pain status in the 2-4 and 6th hours postoperatively. The patients were questioned in terms of postoperative gas-gaita output time. Patients were evaluated for postoperative mobilization. The patients were evaluated in terms of postoperative narcotic analgesic requirements. Patients included in the study were evaluated for postoperative home comfort. The patients included in the study were evaluated in terms of the time to return to daily basic work. In addition, the patients were evaluated in terms of the duration of feeling like they did before the surgery. As a local anesthetic agent, 1 ampoule of 5 mg bupivacaine 0.5% was diluted into 20 ccs and administered to the patients. As a local anesthetic agent, 1 ampoule of 5 mg bupivacaine 0.5% was diluted into 20 ccs and administered to the patients. 5 ccs of diluted bupivacaine was injected into both fascial corner suture points. The remaining 10 ccs of diluted bupivacaine were administered along the incision line. After the procedure, the patients were followed up in terms of the parameters mentioned above. Verbal rating scales (VRS) and visual analog scales (VAS) were used to evaluate the pain of the patients. A 5-point sedation scale was used to evaluate the postoperative consciousness status of the patients. According to the 5-point sedation scale 1: The patient is awake 2: The patient tends to sleep, awake 3: The patient is asleep, he can be woken up with a sound stimulus 4: The patient can be woken up with a physical stimulus 5: The patient cannot be woken up with both physical and audible stimulus. VAS and VRS pain scales were applied to patients who were 2 and 1 according to the sedation scale. Patients were informed about VAS and VRS before surgery. According to the pain scale 1-4 points as mild pain, 5-6 points as moderate pain, and 7 and above points as severe pain. Pain assessment was performed at 2-4 and 6th hours postoperatively. Postoperative gas-gaita output was evaluated at 3-6-9 and 12th hours. During the postoperative mobilization, the patient's pain status and ease of mobilization were evaluated. Patients were grouped as easily mobilized, unaided mobilized with mild pain, moderately painful assisted mobilization, and severe pain assisted mobilization. After discharge, the patients were evaluated in terms of home comfort in terms of 4 parameters. The patients were grouped

as those who can move very well at home have low pain, have minimal pain with moderate movement, moderate pain with moderate movement, moderate pain that is not unbearable, and need medication and hospital for sedentary pain. The patients were evaluated in terms of the time to return to their daily basic work during the first 3 days, the first week, the first two weeks, and over two weeks. Again, the patients were evaluated in the first week, the second week, the third week, and the first month in terms of feeling themselves as before. All pain assessment was done on an individual patient basis without guidance. No additional intervention was performed in the control group of patients, except for the operation procedure. Standard pain relievers were administered to the patients in the postoperative recovery room. As the first step, 10 mg/ml intravenous (IV) paracetamol was given. Dexketoprofen 50 mg/2 ml was administered intravenously in patients with pain despite paracetamol administration. He did not need narcotic analgesics in the recovery room. Standard drugs were used for pain protocol in the service to the patients.

1. Paracetamol 10 mg/ml IV was given up to 4 times a day.
2. Dexketoprofen was administered IV in 50 mg/2ml mediflex up to 3 times a day.
3. Pethidine HCL 100 mg/2ml was administered 75 mg intramuscularly (IM) to patients with ongoing pain. Pain scoring was done by the trained nurse working in the service. Which patients were administered local anesthesia was not specified in the file for study safety. The nurse who performed the pain scoring was not informed about which patients received local anesthesia. The patients were discharged at the postoperative 24th or 48th hours. In the Pfannenstiel technique, the skin incision was placed about 2cm above the symphysis with the mid-portion of the incision lying within the shaved area of the pubic hairs. The skin and subcutaneous tissues were passed. The fascia was opened with the help of tissue scissors. The rectus muscle was crossed with blunt dissection. The parietal peritoneum was opened and the abdomen was entered. Peritonization was not performed after the operation. The rectus was not sutured. A standard procedure was used for each patient. The study was carried out in a single-center, multidisciplinary 95% confidence interval.

Ethical Approval

The study was approved by the ethics committee of Muğla Sıtkı Koçman University Faculty of Medicine with Protocol No: 220018 and Decision No: 21. The study was conducted by the Declaration of Helsinki. Informed consent was obtained from the patients included in the study.

Statistical Analysis

The data of the research were analyzed with the Statistical Package for the Social Sciences (SPSS) Version 28.0.1 (PASW Inc, Chicago, IL, USA) program. The research data were analyzed with descriptive statistics, a chi-square test, and a t-test. Values at the $P<0.05$ level will be considered statistically significant.

RESULTS

Age, indication for surgery, and estimated blood loss did not differ significantly between the groups. In our study, there were no patients under the age of 18 and between the ages of 18-25 who had a hysterectomy. There were 68 (28.3%) patients between the ages of 25-35 and 172 (71.7%) patients over the age of 35. The BMI values of 61 patients included in the study were between 18.5-24.9, 95 patients had a BMI between 25-29.9, 55 patients had a BMI between 30-39.9, and 29 patients had a BMI of 40 or more. There is no patient with a BMI below 18.5. In our study, 240 abdominal hysterectomy patients were operated on under general anesthesia. General specifications are given in table 1. Pain scores in the first 2 hours were found to be lower in Group 1, which was administered local anesthesia, compared to Group 2, which was not applied. Compared to the 2nd group, the pain scores were found to be statistically significantly lower in the first 2 hours in the 1st group ($p=0.007$). However, there was no statistically significant difference between the two groups in terms of pain scores at 4 and 6 hours. VAS and VRS scores of both groups are given in Table 2. The need for postoperative narcotic analgesic use was found to be lower in the 1st group. The need for postoperative narcotic analgesic use was less in the 1st group compared to the 2nd group, and a statistically significant difference was found ($p=0.04$). The narcotic analgesic usage rates are given in Table 3. Postoperative gas-gaita release time was found to be shorter in Group 1 patients compared to Group 2 patients. The gas-gaita output time was shorter in the 1st group patients compared to the 2nd group patients, and the result was statistically significant ($p=0.038$). Gas-gaita discharge times of the patients are given in Table 4. Postoperative mobilization was performed more easily and comfortably in the 1st group of patients who were administered local anesthesia. Postoperative mobilization was easier and more comfortable in Group 1 patients compared to Group 2 patients, and it was statistically significant ($p=0.004$). Mobilization data of both groups are given in Table 4. There was no statistically significant difference between the two groups in terms of home comfort, doing simple tasks, and feeling like before. The patients' home comfort, doing simple tasks, and feeling as before are given in Table 4.

DİSCUSSİON

In our study, it was observed that there was a significant decrease in pain values in the first two hours in the group that received local anesthesia. As a result of our study, it was determined that there was a decrease in the need for narcotic analgesics in the local anesthesia group compared to the group that was not administered. Fabio Ghezzi et al. In 2005, conducted a study on the application of local anesthesia to the

port entrance area in gynecological laparoscopy. They administered ropivacaine to 86 patients and administered saline solution to 84 patients. As a result of the study, they stated that there was no significant difference between the two groups in terms of postoperative pain. They also stated that there was no significant difference between the two groups in terms of analgesic consumption in the first 24 hours after surgery and the time to first analgesic request (16). Jennifer OGrupe et al. In 2001, conducted a study of 0.25% bupivacaine injection into trocar insertions on 164 patients. As a result of this study, it was reported that preemptive analgesia did not reduce postoperative pain or shorten the time to return to normal activities in patients who underwent gynecological laparoscopy (17). Deborah Arden et al. In 2013, conducted a study on intraperitoneal administration of bupivacaine in patients who underwent a laparoscopic hysterectomy. As a result of the study, it was reported that intraperitoneal instillation of bupivacaine at the end of laparoscopic hysterectomy did not reduce postoperative pain. Again, it was reported that there was no difference in the use of opioid analgesics, length of hospital stay, general patient satisfaction, and complication rates (18). Caroline Ravndal et al. conducted a study in Norway of 0.5% bupivacaine injection into each trocar site in patients undergoing laparoscopy. In this study, the median score for motion-induced pain 5 hours after surgery was significantly lower in the intervention group. (1 to 3, p=0.044). However, after 2 and 5 hours, there was no difference in resting pain and rescue analgesic requirement. As a result of the study, it was reported that the application of local anesthetic provided a reduction in pain with movement (19). Yin-Jou Chou et al. In 2002-2003, applied 10 mL of 0.5% bupivacaine (50 mg) + epinephrine (1:500), 100 mg of bupivacaine, and placebo to patients who underwent laparoscopy. As a result of this study, they found that intraperitoneal bupivacaine administration was effective in reducing the intensity of abdominal visceral pain after advanced gynecological laparoscopic procedures, but was not effective in reducing shoulder pain, abdominal parietal pain, or postoperative analgesia consumption (20). Cliff K-S Ong et al. The study conducted in 2005, determined that local anesthesia provided a reduction in analgesic consumption and time to the first analgesic requirement. However, in this study, they found that local anesthesia application did not affect postoperative pain scores (21). Jennifer L Marks et al. In a study they conducted in 2012, it was determined that local analgesia given intraperitoneally after gynecological laparoscopy significantly reduced pain in the first 6 hours (22). Jaime B Long et al. A meta-analysis they conducted in 2018, reported that incisional local anesthetic infiltrations had a moderate effect. They also stated that the results obtained from previous studies in this meta-analysis were contradictory. In addition, they found that intraperitoneal analgesia given after the completion of surgery is likely beneficial (23). In our study, it was found that local anesthesia application provides convenience in postoperative mobilization. Again, gas-gaita release times were found to be shorter in patients who were administered local anesthesia compared to the control group. In addition, it was determined that there was a decrease in the need for narcotic analgesics in patients who were administered local anesthesia. J Kato et al. found that preoperative 0.25% bupivacaine infiltration after diagnostic laparoscopic gynecological interventions is a useful method to reduce postoperative wound pain for up to 10 hours and analgesic consumption for up to 24 hours (24). Nuray Altay et al. A study conducted in 2009, reported that intraperitoneal and incisional local anesthetic application could be used as an effective method in the treatment of postoperative pain after laparoscopic cholecystectomy (25). Gülsüm Altuntaş et al. A study conducted in 2016, reported that local anesthetic infiltration instead of trocar incision in laparoscopic cholecystectomy cases can be used more widely because it is an easy, safe, effective method of postoperative analgesia, with less morphine consumption and fewer side effects (26). The current literature supports the results of our study. In our study, we also hope that the results of ease of mobilization and gas-gaita release time will contribute to the literature. The fact that local anesthesia application did not affect the pain results after the first 2 hours in our study may have many consequences. First, the dose of analgesic we use may be insufficient. The maximum allowable dose of Bupivacaine for local analgesia in adults is 175 mg because it is associated with the highest risk of cardiovascular toxicity among the various local anesthetics available (27). Therefore, it is possible that we did not reach an adequate threshold for postoperative pain relief due to safety concerns. Secondly, the pain results of the patients in our study may have been affected due to the differences in the operation indications. This study has several strengths. The randomized, double-blind design, as well as the implementation of standardized intraoperative and postoperative protocols for pain relief, minimized the potential risk of bias. Finally, we also investigated the effect of preventive analgesia on drug use, including postoperative pain levels and demand for opioid-based analgesics. Again, mobilization, gas-gaita output, home comfort, time to do simple things, and feeling like before are the parameters that make the difference. However, our study is not free from limitations. To begin with, we evaluated only short-term outcomes for pain, i.e. the first 6 hours after surgery. However, since no difference was detected after the first 6 hours, it is unlikely that we will find any difference in the following periods. Finally, for the surgeries included in this study, the anesthesia method may differ in expected baseline pain levels, and this variation can be a confounding factor.

CONCLUSION

In the final result of our study, it was determined that the application of local anesthesia to the incision area resulted in

a decrease in pain scores in the first 2 hours. A decrease in the need for narcotic analgesics was found in patients who were administered local anesthesia. Mobilization was easier in patients who were administered local anesthetics, and the gas-gaita release time was found to be shorter.

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TABLES

Table 1: Demographic Characteristics

	Number (n)	Percent (%)
Age (Year)		
18-25 Ages	0	0
25-35 Ages	68	28.3
Age over 35	172	71.7
BMI (kg/m²)		
18.5-24.9	61	25.4
25-29.9	95	39.6
30-39.9	55	22.9
40 and Over	29	12.1
Local anesthesia		
Yes	120	50.0
No	120	50.0

Table 2: Postoperative VAS and VRS Scores

		Absent		Mild 1-2 points		A Little more 3-4 points		Moderate intensity 5-6 points		Severe 7 points and above		Total		
	Local anesthesia	N	%	N	%	N	%	N	%	N	%	N	%	P
2. Hours	Yes	24	10	26	10.8	22	9.2	32	13.3	16	6.7	120	50	**0.007 ***
	No	6	2.5	8	3.3	32	13.3	46	19.2	28	11.7	120	50	
4. Hours	Yes	34	14.2	28	11.7	36	15	18	7.5	4	1.7	120	50	0.07
	No	14	5.8	22	9.2	62	25.8	20	8.3	2	0.8	120	50	
6. Hours	Yes	48	20	48	20	20	8.3	4	1.7	0	0	120	50	0.27
	No	30	12.5	58	24.2	30	12.5	2	0.8	0	0	120	50	

N: Number, %: Percent, VRS: Verbal Rating Scales, VAS: Visual Analog Scales

*Pearson Chi-Square test 95% confidence interval $p<0.05$ values are significant

Table 3: Need for Narcotic Analgesics

			Narcotic analgesic need			
			No	Yes	Total	P
Local anesthesia	Yes	Number (N)	84	36	120	**0.04***
		Percent (%)	35	15	50	
	No	Number (N)	62	58	120	
		Percent (%)	25.8	24.2	50	

*Pearson Chi-Square test 95% confidence interval p<0.05 values are significant

Table 4: Other Parameters

		İn the first 3 hours		İn the first 6 hours		İn the first 9 hours		12 hours and over		Total		
	Local anesthesia	N	%	N	%	N	%	N	%	N	%	P
Gas-Gaita Output	Yes	24	10	56	23.3	34	14.2	6	2.5	120	50	**0.038***
	No	10	4.2	42	17.5	50	20.8	18	7.5	120	50	
Mobilization		Very comfortable		Mild pain unsupported		Moderate pain supported		Severe pain assisted		Total		
	Local anesthesia	N	%	N	%	N	%	N	%	N	%	P
	Yes	4	1.7	50	20.8	62	25.8	4	1.7	120	50	**0.004***
	No	8	3.3	22	9.2	66	27.5	24	10	120	50	
Home comfort		Well moving in significant pain		Moderate mobility insignificant pain		Moderate mobility tolerable pain		İnactive medication-hospital need		Total		
	Local anesthesia	N	%	N	%	N	%	N	%	N	%	P
	Yes	8	3.3	40	16.7	64	26.7	8	3.3	120	50	0.234
	No	6	2.5	22	9.2	78	32.5	14	5.8	120	50	
Doing simple jobs		First 3 days		First 1 week		First 2 weeks		Over 2 weeks		Total		
	Local anesthesia	N	%	N	%	N	%	N	%	N	%	P
	Yes	6	2.5	32	13.3	66	27.5	16	6.7	120	50	0.310
	No	4	1.7	24	10	60	25	32	13.3	120	50	
Don't feel like before		First week		Second week		Third week		First month		Total		
	Local anesthesia	N	%	N	%	N	%	N	%	N	%	P
	Yes	8	3.3	28	11.7	76	31.7	8	3.3	120	50	0.910
	No	6	2.5	14	5.8	76	31.7	24	10	120	50	

N: Number, %: Percent

*Pearson Chi-Square test 95% confidence interval p<0.05 values are significant