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EFFICACY OF PATIENT-CONTROLLED EPIDURAL ANESTHESIA IN OPERATIVE GYNECOLOGY

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Abstract:
In the early postoperative period, one of the main causes of inadequate anesthesia is the routine use of opioid analgesics "for pain" or in the form of "planned" injections in standard doses, which, according to our data, are insufficient in 36-59% of patients (Lebedeva R.N., Nikoda V.V., 1998). The purpose of anesthesia is not only to eliminate suffering and create psychological comfort, but also to improve the quality of life of women operated on for gynecological operations, accelerate postoperative functional rehabilitation, and reduce the incidence of complications [4].

Keywords: Anesthesia, CPA, EAC, hysterectomy, Patient Controlled Analgesia, ASA, psychological comfort.

Introduction

The problem of treating postoperative pain is relevant both in our country and abroad. According to the literature, 30–75% of patients suffer from severe pain syndrome in the postoperative period. An important direction of optimizing the effectiveness of analgesic therapy is the development of new ways and methods of "delivery" of analgesics into the body. Patient Controlled Analgesia (PCA) or "on-demand" analgesia is an alternative to the traditionally used "indicated" or routine analgesic. The patient independently administers an analgesic (e.g., intravenously) by means of doses predetermined by the doctor in the following cases: with the help of a programmable syringe perfusor [3].

Pain relief is achieved through repeated administration of small doses of the analgesic. In fact, when pain occurs, the patient titrates the administration of the analgesic, evaluates its effect and determines the most acceptable level of pain for himself. The principle of patient-controlled analgesia (CPA) is easily digested by patients and 87% prefer it to the routine prescription "for pain". In this technique, the patient independently administers the analgesic using a programmable syringe perfusor by means of doses predetermined by the doctor. Pain relief is achieved through repeated administration of small doses of the analgesic. If pain occurs, the patient titrates the administration of the analgesic, evaluates its effect and determines the most acceptable level of pain for himself. The principle of working with KPA is easily assimilated by patients. As the pain increases, the patient independently, By pressing the remote control button, titrates the bolus dose of the analgesic until the desired effect is achieved [1; 2; 4; 5].

KPA has a number of advantages over traditional analgesics. This is the provision of effective pain relief according to the individual needs of the patient; quick achievement of the desired effect; reducing the amount of time the patient is without pain relief; stable concentration of the analgesic in blood plasma. In addition, the use of CPA saves time for medical personnel, reduces the incidence of side effects, and shortens the time spent in the hospital [3; 5].

In this regard, the aim of our study was to assess the effectiveness of CPA after hysterectomy.

Material and Methods of Research

Our randomised trial included 36 patients aged 65 to 80 years (mean age 78 ± 8 years) with ASA 3 or higher physical status and scheduled for hysterectomy. Operative procedures and postoperative prescriptions have been standardized. Visual analogue scales of pain and satisfaction with pain control were recorded over a period of 3 days. All patients had concomitant pathology: coronary heart disease - 9, hypertension - 12, atherosclerosis - 15, chronic bronchitis - 10. The patients underwent gynecological surgical interventions: 20 patients underwent total hysterectomy, 16 patients underwent subtotal hysterectomy. The study was performed in The patients were treated in the Department of Gynecology of the TMA Clinic with the diagnosis: uterine fibroids.

All the examined patients were divided into 2 groups. In group 1 (n = 19), postoperative anesthesia was traditionally administered by administering opioid analgesics at the patient's request. In the 2nd group of patients (n = 17), postoperative anesthesia was carried out with the use of EAC with the CPA device "Accumate-1100. Electronic PCA». 0.25% longocaine solution 5 mL was fractionally injected into the epidural catheter by the patient himself every 4 hours. Within 24 hours after surgery. The study and control groups of patients were comparable in terms of age, volume and duration of surgical intervention.

Motor blockade was assessed on the P.R. Bromage scale. Postoperative anesthesia was assessed using the Visual Analogue Scale (VAS), hemodynamic indicators (HR, SBP, BH) $SatO_2$.levels of the hormone cortisol and glucose in the blood plasma. Measurements of hemodynamic parameters were carried out at the following stages: 1 – at baseline, before the onset of analgesia, 2 – after the administration of the analgesic in 20 minutes, 3 – 24 hours after surgery.

All numerical values obtained during the study are processed by the method of variational statistics using the Student's t-test using the program and are represented as M = m, where M is the arithmetic mean and m is the standard error. The differences were considered statistically significant at $p < 0.05$.

Results and Discussion

Before the start of anesthesia, the respiratory and hemodynamic parameters of both groups were almost identical. As can be seen in Table 1 below, all patients experienced severe pain (VAS score greater than 7) before initiating analgesia, which was clinically accompanied by tachycardia, moderate hypertension, and rapid breathing.

In group 1, the administration of standard anesthesia led to a decrease in the severity of the pain syndrome. Parenteral administration of narcotic analgesics was often not effective enough to relieve pain, although the intensity of the pain syndrome was higher than 4 points on the VAS, which is an indication for the prescription of opiates. However, the use of drugs in this group is associated with a fairly large number of complications and side effects (hypotension – 2, decreased saturation – 3, bradypnea – 1), which are noted more often in elderly patients (over 80 years old). At the same time, postoperative nausea and vomiting were significantly more common in the group (n=6). Almost 30% of patients in the group had adverse reactions.

In the 2nd group, against the background of CPA, not a single case of severe pain was recorded, the lowest indicators of pain syndrome severity were noted. Mild motor blockade (1-2 Bromage points) was observed in 3 patients in group I ($p = 0.5$). Motor blockade occurred in the first 12 hours after surgery and resolved after patients independently increased the intervals between using the patient's

remote control. Epidural anesthesia is as effective in terms of risk/benefit ratio. The main disadvantages of neuraxial analgesia are arterial hypotension (n=2), acute urinary retention (n=1), and post-puncture syndrome (n=2). No other adverse events typical of neuraxial blockade, including those of an infectious nature, were recorded.

As a result of the study of postoperative anesthesia with the use of EACP, no statistically significant changes in the parameters of the hemodynamic system, a decrease in systolic and diastolic pressure were revealed (see Table 1). Also, in contrast to the control group, cardiodepression with a decrease was not found in the study group. This is probably due to the ability to independently select the optimal dose of painkillers, when, when reaching a state of comfort in the first hours after surgery, patients maintained this state at an acceptable level for each of them.

In our studies, all patients did not have severe pain. In the study groups, there were no cases of complications related to the side effects of drugs or the method of anesthesia during the period of hospitalization.

Table 1. Indicators of hemodynamics, respiration and severity of pain syndrome in operated women

Indicators	Group 1			Group 2		
	Stage 1	Stage 2	Stage 3	Stage 1	Stage 2	Stage 3
BP mmHg	128.5 ±5.7	119.5 ±5.4	120.5 ±5.2	126.7 ±5.2	123.5 ±5.7	121.5 ±5.3
BPd mmHg	85.6 ±5.3	81.6 ±5.1	81.4 ±5.3	84.5 ±5.1	84.1 ±5.3	83.1 ±5.1
Heart rate bpm	86.8 ±7.4	78.8 ±7.4	73.8 ±3.4	85.8 ±8.0	74.8 ±7.4	71.8 ±4.4
Black Hole in min	18.6 ±2.4	14.6 ±2.4	14.6 ±2.4	18.5 ±2.6	16.6 ±2.5	15.6 ±2.5
Sat O2, %	98.3 ±1.5	96.3 ±1.5	97.3 ±1.5	98.1 ±1.7	98.3 ±1.8	99.3 ±0.6
YOUR Points	7.4±1.3	3.6±1.8	3.5±1.5	7.2±1.9	1.5±0.5	1.2±0.2
Cortisol, n/mol/L	186.1±51.1	184.5±49.1	178.1±43.1	186.2±52.1	149 ± 43, 1	145.3±32.1
Glucose, mmol/L	6.1±1.3	4.26 ± 0.4	4.3±0.3	6.2±1.5	4.09 ± 0.3	4.04 ± 0.1

When analyzing the results of the study of the analgesic effect in the postoperative period with the use of patient-controlled epidural analgesia (EAEC), a clear trend towards a decrease in cortisol and glycemia levels was established, which was not observed in the control group. The decrease in cortisol levels is due to the interruption of noception in the lesion, since there is no activation of the hypothalamic-pituitary-adrenal (HPNS) system. The humoral pathway is the direct entry of inflammatory mediators into the blood and the activation of the HGNS. Blood glucose levels are almost at the same level with a slight fluctuation, which indicates deactivation of the HGNS.

The results of studies evaluating the effectiveness of CPA show that pain relief should be started as early as possible. Patients who started CPA with mild pain (at rest) were 30% more likely to have good results than patients with severe pain. Inadequate analgesia is noted in 15% of patients using CPA in the setting of severe or unbearable pain. At the same time, If the initiation of CPA was performed in the setting of no or mild pain at rest, ineffective analgesia was noted in only 3% (p less than 0.05) of patients. The effect of analgesia begins 20-30 minutes earlier, because there is no time spent on obtaining the doctor's permission and preparing for the injection by the nurse.

Patient-controlled anesthesia is a method that makes it possible to select an effective individual dose and self-control of pain sensations in 82-95% of patients by titration depending on the analgesic administered.

In this way, the CPA method provides adequate pain relief according to the individual needs of the patient. In patients who have undergone hysterectomy, patient-controlled analgesia provides sufficient hemodynamic stability and preservation of lower limb motor activity.

Advantages of the method: rapid analgesia, bypasses the gastrointestinal barrier, is controlled by the patient, and is programmed.

KPA is a reliable way to achieve analgesia in the postoperative period in total and subtotal hysterectomy. Epidural analgesia with extended infusion provides reliable nociceptive protection, and the use of low concentrations of local anesthetics prevents the onset of movement disorders. As a result, early activation of patients is possible, even in the presence of epidural analgesia.

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