SCIENCE AND INNOVATION
INTERNATIONAL SCIENTIFIC JOURNAL VOLUME 3 ISSUE 4 APRIL 2024
ISSN: 2181-3337 | SCIENTISTS.UZ

POTENTIZED ANALGESIS AFTER THORACIC OPERATIONS IN CHILDREN

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https://doi.org/10.5281/zenodo.11079291

Abstract*. Purpose of the study: Improving the quality of pain relief as a component of intensive care, continuous infusion infulgan in combination with promedol after thoracic surgery in children.*

Material and research methods. The study was conducted in the postoperative ward of the intensive care unit and the surgical wards of the TashPMI clinic in 42 children aged 7 to 15 years after thoracic operations. Anesthetic management of the operations was carried out under general combined anesthesia with the use of artificial ventilation.

Studies were carried out on the functional state of the children's body by comparatively characterizing hemodynamic parameters, using studies of the clinical course of the postoperative period with monitoring of oxygen saturation, blood pressure, blood pressure, central hemodynamic parameters, and blood sugar concentrations. The clinical status of patients was assessed using a visual analogue scale (VAS).

Results. The development and implementation of the infulgan + promedol method of pain relief after thoracic operations in children will complement the arsenal of safe methods of postoperative pain relief in pediatric anesthesiology. The optimal option for pain relief after thoracic interventions in sick children is a combination of drugs promedol and infulgan, which provide prolonged analgesia.

Keywords*: thoracic operations, pain relief after thoracic operations, non-steroidal anti-inflammatory drugs, paracetamol, infulgan, promedol, visual analogue scale.*

Pain management is one of the most important tasks in the postoperative period. Effective pain relief promotes early rehabilitation of the patient, reduces the incidence of postoperative complications and chronic pain syndromes [1, 2, 4].

The simultaneous use of drugs from different groups makes it possible to block the conduction of nociceptive (pain) impulses at all levels, reduces the dose of each analgesic, improves the quality of pain relief and significantly reduces the number of side effects [3, 8, 9].

The problem of the formation of postoperative pain still remains relevant, when patients in thoracic surgical departments continue to experience pain and impaired sensitivity in the chest after surgery. In addition to the ethical side of the issue related to the patient’s right to adequate pain relief, there is a danger of impaired pulmonary function in patients with an inadequately selected analgesia regimen, which contributes to the development of pulmonary and cardiac complications [5, 6, 7, 10]. Currently, the proposed methods of pain relief include potentiated pain relief with non-narcotic and narcotic analgesics. The use of continuous infusion of infulgan as potentiation - mixed anesthesia, enhancing the effect of narcotic analgesics is relevant today [11, 12, 13, 14].

Thus, the most optimal pain relief for children after traumatic operations is the combined use of NSAIDs with opioid analgesics. The synergism of the analgesic effect of opioids and NSAIDs allows for 20–60%. reduce the need for opioid analgesics and reduce their side effects.

This combination of drugs helps to improve the function of external respiration and rapid restoration of gastrointestinal motility.

Purpose of the study: Improving the quality of pain relief as a component of intensive care using continuous infusion of infulgan in combination with promedol after thoracic operations in children.

Material and research methods. The study was conducted in the postoperative period in 42 patients after thoracic surgery at the TashPMI clinic.

Table 1.

Distribution of patients by type of surgical intervention

Type of surgery	7 – 10 years	11 – 14 years	Total:
Echinococcectomy of the lung	11	7	18
Thoracoplasty	14	6	20
Lobectomy	4	-	4
Total:	29	13	42

Children aged 7 to 10 years made up 69.04% of the total number of patients, children from 11 to 14 years old – 30.96%. The majority of patients (80.95%) were operated on as planned, and 19.05% - for emergency reasons.

In the presence of pain after thoracic operations (for pulmonary echinococcosis, pleural empyema, lobectomy), a continuous infusion of infulgan was performed at a dose of 50-60 mg/kg per day. The resulting dose of the drug was administered intravenously through an infusion machine evenly throughout the day. For the combination, a 1% solution of promedol was used at a dose of 0.2 ml/year of life. In the second group, tramadol was used at a minimum dose of 1.5 mg/kg intravenously 2 times a day in combination with baralgin 2 times a day at a dose of 50-100 mg per 10 kg of body weight. The study of the clinical course of pain relief with a subjective assessment of pain intensity according to VAS, hemodynamic studies were carried out at the following stages: stage 1 - pain syndrome; Stage 2 - after 30 minutes; Stage 3 - 60 minutes after pain relief; Stage 4 - 2 hours after anesthesia, stage 5 - after 5 hours, stage 6 - after 10 hours.

Results and discussion. In the early postoperative period, pain did not develop in children for 4.3 ± 0.5 hours. Against the backdrop of the onset of pain syndrome, children became restless, cried loudly, older children complained of pain in the area of the postoperative wound. Pain relief was performed with promedol at a dose of 100-200 mcg/kg body weight 2 times a day and continuous infusion of infulgan at a dose of 50-60 mg /kg per day. After pain relief, the children's condition began to stabilize.

The subjective assessment of pain intensity according to VAS before anesthesia was 2.47± 0.18 points. The children's condition was stable. The children answered questions adequately and had no complaints of pain at rest.

Body temperature in the early postoperative period increased in 8 children (22.5%), in the remaining children it remained within normal limits. Hourly diuresis was 24.4 ± 4.7 ml/hour.

After 30 minutes intramuscular administration of promedol, no complaints of pain were noted in any child. Palpation of the wound, coughing and deep breathing were painless. Behavioral reactions characterizing pain syndrome were not observed. The VAS pain intensity score was 1.28□0.16 points, which was statistically significant compared to the previous stage ($p<0.01$). Clinical parameters remained stable and no significant difference was noted.

After 1 hour anesthesia, the children's condition was stable, there were no complaints of pain. The children became active and moved around in bed. There was no pain in the area of the postoperative wound during movement or palpation. The VAS pain intensity score was 1.0□0.0 points. Hourly urine output increased to 32.3 ± 5.2 ml/hour.

After 2 hours the start of anesthesia, pain at rest, with movements, coughing and palpation was absent in all patients. There were no characteristic behavioral reactions. Motor activity was maintained. The VAS pain intensity score did not change: 1.0□0.0 points. Body temperature remained elevated in 5 patients (13.9%). Hourly diuresis remained virtually unchanged: 32.8 ± 4.5 ml/hour.

After 5 hours anesthesia, 1 child developed pain with movement and deep breathing. The rest did not experience pain during physical activity. The VAS pain intensity score was 1.0□0.0 points. Hourly diuresis values remained within normal limits: 36.2 ± 6.8 ml/hour.

By the tenth hour of observation, pain appeared in 14 children (38.9%), 1 child (2.9%) had pain at rest, the rest - with movement, deep breathing, coughing and palpation of the postoperative wound. The intensity of pain was mild in 10 children (27.8%) and did not require additional pain relief, and moderate in 5 children (13.9%). The VAS pain intensity score was 1.78±0.23 points. Hourly diuresis decreased slightly, but remained within the normal range: 32.1 ± 5.8 ml/hour.

The duration of pain relief was 6.3 ± 1.0 hours.

Thus, the clinical course of pain relief with promedol and infulgan was characterized by a pronounced potentiated and long-lasting analgesic effect. Effective and adequate pain relief was observed in 98% of children.

After 8 hours, there was a slight increase in heart rate by 1.3% compared to the previous stage. The cardiac index, like the UI, changed slightly during the stages of the study. From stage I to VI, SI decreased from 4.43 □ 0.9 to 4.52 □ 0.93. After 5 hours of the study, SI decreased by 5.3% in relation to the values during anesthesia and amounted to 4.69 □ 0.99.

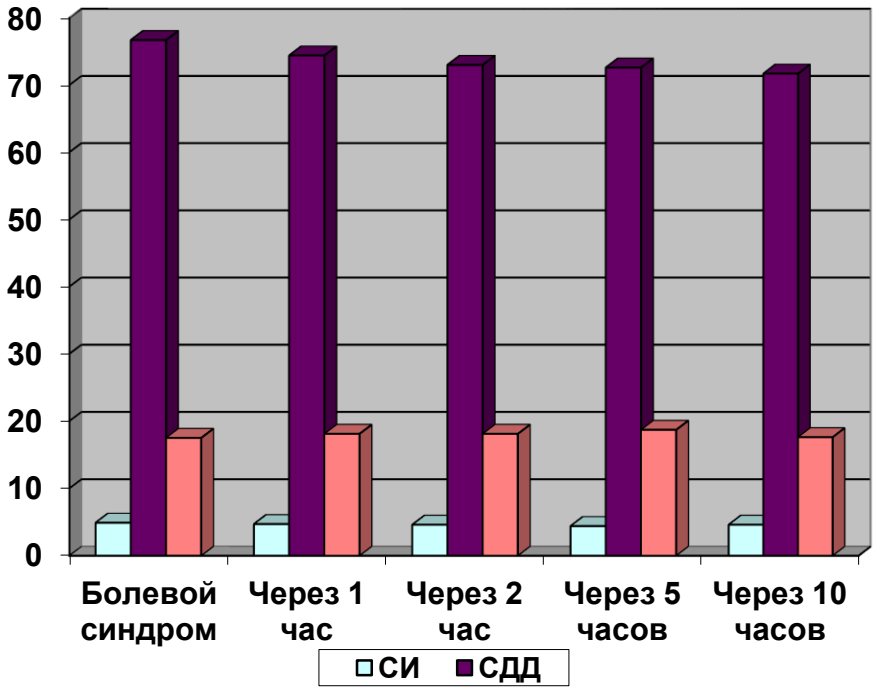

Figure 1. Changes in central hemodynamic parameters during analgesia with promedol and infulgan

Heart pumping function also remained stable throughout the study. The FI data practically did not change from stage I to stage VII of the study, amounting to 75.6 □ 4.5 at stage I and 75.4 □ 5.3 at stage VII.

When analyzing changes in MDD during observation, a tendency towards a gradual slight decrease was revealed: from 76.75 ± 2.22 at the time of anesthesia to 71.75 ± 1.5 5 hours after anesthesia. UPS at the beginning of anesthesia was reduced by 12.5% compared to baseline data.

After 1 hour anesthesia, SRL increased to 18.10 ± 2.77, which is 3.1% higher than the data at the previous stage. After 2–3 hours, the SRL remained virtually unchanged.

By the 5th hour, the UPS index decreased by 5.9%, and 10 hours after anesthesia it was 18.08 ± 3.01, which is 2.4% higher than the previous stage. All changes in EchoCG parameters were statistically insignificant (P>0.05).

When studying children of the second group in relation to the initial values of RR, HR, BP syst, BP diast. were reduced by 17.1%, 17.3%, 9%, 13.4%, respectively.

By the 5th hour of anesthesia, there was a resumption of pain at rest in 87.2% of patients.

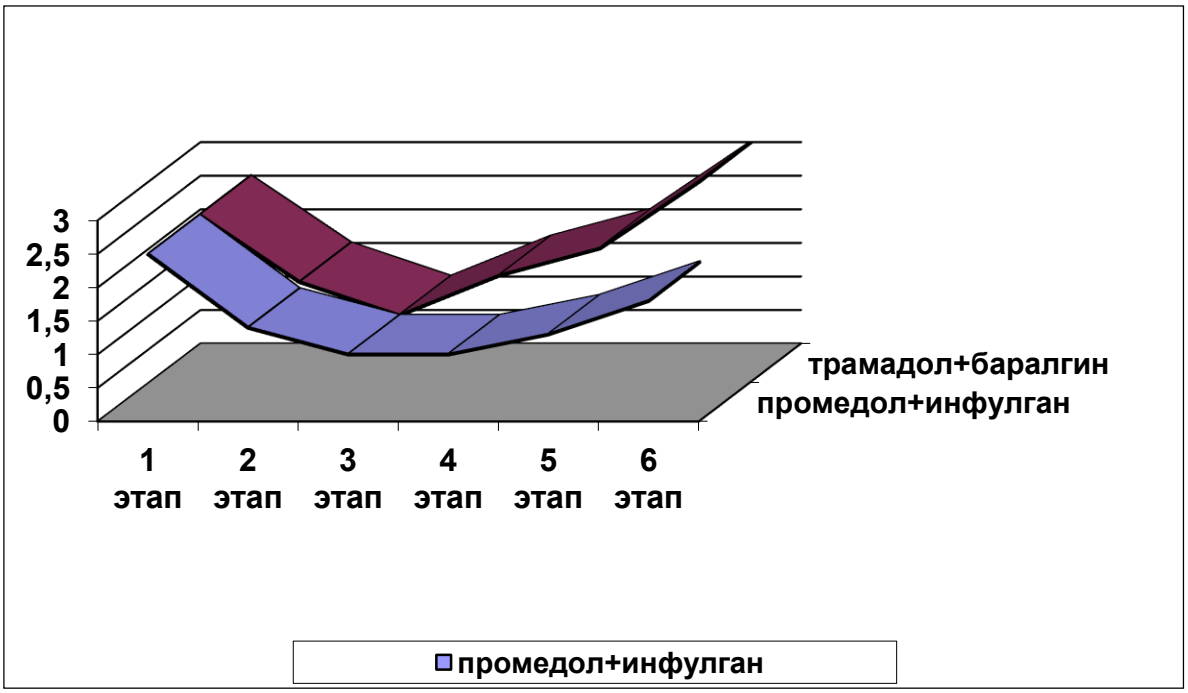

Figure. 2. Dynamics of pain intensity assessment according to VAS during postoperative pain relief

The duration of pain relief varied from 3 to 6 hours, and in 53.1% of patients it exceeded 5 hours of the postoperative period.

At the stages of the study, an increase in SV, SDD and SI was observed, respectively, by 20.66%, 9.38% and 21.5%. UPS decreased by 13.28%. There was a tendency towards a decrease in the ejection fraction (EF).

Thus, the duration of pain relief with promedol against the background of continuous infusion of the infulgan was 9.2 ± 0.8 hours, the duration of pain relief with tramadol was 5.3 ± 0.6 hours. The clinical course of pain relief in the group of patients using promedol and infulgan was characterized by a pronounced and long-lasting analgesic effect.

The development and implementation of infulgan + promedol and tramadol + baralgin pain relief techniques after thoracic operations in children will complement the arsenal of safe methods of postoperative pain relief in pediatric anesthesiology.

The optimal option for pain relief after thoracic interventions in sick children is a combination of the drugs promedol and infulgan, which provide prolonged analgesia.

Conclusions. 1. The dynamics of pain intensity assessment according to VAS during postoperative analgesia with promedol and infulgan after thoracic operations accompanied by high-intensity pain showed the effectiveness of analgesia.

2. Methods of pain relief using promedol and infulgan and pain relief using tramadol and baralgin are characterized by a smooth course of the postoperative period and the absence of a negative effect on the main hemodynamic parameters.

3. The combination of promedol and infulgan, in terms of analgesic effect, was slightly higher than the combination of tramadol and baralgin.

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