Introduction

Currently, the trauma clinic widely used various kinds as a regional or general anesthesia, which have their advantages and disadvantages.

One of the criteria for the adequacy of antinociceptive protection during surgery is stable hemodynamics. But to really ensure this protection should be reduced to a safe level of intensity flow from peripheral nociceptive receptors to the central structures of the brain. To cope with this challenge should help sustainable integrated anesthetic management.

It is known that in trauma operations gold standard selection methods are regional anesthesia, but in cases where their use is not possible or desirable for any reason, anesthesiologists employ other methods of anesthesia.

In this regard, the study hemodynamic objectification always important for adequate anesthesia and justify the selection of the method of anesthesia when trauma operations.

The aim is to study hemodynamic status and assess the level of pain in trauma patients under different types of anesthesia.

Materials and methods

The study was performed on the basis of the Department of Anesthesiology and Intensive Care of Kharkiv Regional Clinical Traumatological Hospital during 2013-2015 years. After obtaining the consent of the study included 102 patients: 72 males (70.6%), 30 women (29.4%) at the age from 18 to 45 years (33,5 ± 0,7 years), who underwent osteosynthesis operations due to traumas of the limbs. Patients were divided into 3 groups according to the type of anesthesia: I group (n = 32) - were operated under regional anesthesia without sedation, II group (n = 44) - were operated under regional anesthesia with sedation, III group (n = 26) - were operated under intravenous anesthesia. The mean duration of surgery was 90,8 ± 3,6 minutes. The patients' age, gender, antropometric data, character of the injury, volume and duration of the surgical intervention were similar in all the groups.

Patients performed surgery on the injury of the upper extremity (38 patients), lower extremity (64 patients). All subjects belonged to class ASA (American Society of Anesthesiologists) - I-II. Exclusion criteria were: neurological disorders, repeated surgery, the use of tranquilizers, antidepressants, nootropics, visual and hearing impairment, alcohol, drug and substance abuse, diabetes, pain is not associated with trauma and surgery.

All patients were performed premedication in the ward for the night before the operation: per os (Phenazepamum 0,03 ± 0,0005 mg/kg) and on the operating table in (atropine - 0,006 ± 0,0001 mg/kg diphenhydramine - 0,13 ± 0,004 mg/kg, diazepam - 0,13 ± 0,002 mg/kg, omnopon - 0,3 ± 0,005 mg/kg).

The patients of the I and II groups were conducted nerve block anesthesia with 1% lidocainum and 1,9 ± 0,04 mkg/kg of buprenorphinum. The patients of the II group received 2,0 ± 0,2 mg/kg/h of propofolum for sedation. The patients of the III group were rendered intravenous anesthesia with artificial lung ventilation, the induction was performed with the thiopentalum natricum in the average dosage of 9,1 ± 0,6 mg/kg, their sleep was maintained with propofolum in the dosage of 4,6 ± 0,4 mg/kg/h, analgesia was rendered by fentanylum in the dosage of 6,2 ± 0,4 mkg/kg/h, myorelaxation - by pipekuronium bromide medium in the dosage of 0,04 ± 0,004 mg/kg.

Perioperative monitoring includes monitoring of systolic, diastolic and mean arterial pressure (MAP), heart rate (HR), pulse oximetry (SpO2), (Monitor Heaco G3L, United Kingdom).

The level of pain was assessed before surgery and at the first postoperative day by a visual analog scale (VAS).

All data are presented as the number of observation (n), the arithmetic mean (M), the average error (m). The significance of differences between the indicators was determined using

Results

Analyzing the data, it can be noted that the hemodynamic before surgery in patients of all groups did not differ significantly.

From these results it is clear that the level at all stages of the MAP does not exceed reference values of all patients groups. As for the heart rate, it should be noted its increase in patients of I and II groups on traumatic phase and at the end of the operation, which may be explained by the action of adrenaline, which is added to the local anesthetic. In patients of group III, on the contrary, the heart rate was reduced by stages II and III, which may be due to the action of propofol. At the 1st day after the operation in patients of group III had a tendency to tachycardia, probably due to the pain. Anesthesia had no signs of hypoxia in patients of all groups.

The level of pain according to VAS preoperatively in all groups did not differ significantly. In the1st day after the operation there was a significant increase in the level of pain in all groups: I - from 3,5 ± 0,4 to 5,6 ± 0,3 scores (p = 0.00002), in II - from 3.3 ± 0,3 to 5,3 ± 0,3 scores (p = 0.000009) and III - from 3,8 ± 0,5 to 5,6 ± 0,4 scores (p = 0.004) compared to the level of before the operation, but in the group of patients who underwent regional anesthesia with sedation, it was the lowest, although intergroup differences at this stage there was no (p>0,05).

Conclusions

1. Regional anesthesia, regional anesthesia with sedation (propofol) and intravenous anesthesia (propofol, fentanyl) demonstrated hemodynamic stability during osteosynthesis operations in young patients.

2. Regional anesthesia with sedation is greater antinociceptive protection in the early postoperative period.