Wieloetapowe badania oceniające wpływ znieczulenia tyletaminą i zolazepamem u psów dążące do ograniczenia emisji szkodliwych czynników środowiskowych

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Abstract

This dissertation evaluates the protocols of balanced anaesthesia in dogs using low doses of tiletamine and zolazepam. The entire research study was divided into three stages.

In the first stage of research 12 dogs were scheduled for the experimental procedure. The Dixon's Up-and-Down method was used to establish the necessity of using isoflurane in dogs induced intravenously with tiletamine and zolazepam at a dose of 5 mg/kg body weight. The patients were stimulated with a noxious stimulus (pressure on the footpad, phalanx, groin area and clamping of the Backhaus on the skin), and throughout the experiment haemodynamic and respiratory parameters were measured (heart rate (HR), respiratory rate (RR), non-invasive blood pressure (BP), saturation (SpO2), temperature (T), end-tidal CO2 (et-CO2), end-tidal isoflurane (et-ISO)).

In the second stage of this study, 20 dogs were scheduled for the experimental procedure. The patients were randomly divided into two groups of 10 animals in each (study group - TZ and control group P). In the TZ group, a mixture of tiletamine and zolazepam was used to induce and maintain general anaesthesia. These medicines were used for induction at a dose of 0.5 mg / kg as an intravenous bolus, followed by a continuous intravenous infusion to maintain anaesthesia at a dose of 1 mg / kg / h. The results were compared with a standard anaesthetic protocol using propofol for induction and maintenance of anaesthesia. Patients in both groups underwent orthopedic surgery on pelvic limbs - TTA (Tibial Tuberosity Advancement). throughout the experiment haemodynamic and ventilation parameters were

measured (heart rate (HR), respiratory rate (RR), non-invasive blood pressure (BP), saturation (SpO2), temperature (T), end-tidal CO2 (et-CO2), end-tidal isoflurane (et-ISO)).

The third stage of the experiment included the assessment of the influence of tiletamine and zolazepam on the quality and time of recovery period in patients with a simultaneous analysis of the level of sedation. For this purpose, patients participating in the second stage of this study were used. Appropriate scales were used for the assessment: the level of sedation was analyzed by the Sedation Assessment and Sedation Level (SASL), and the patients' pain was assessed using the Glasgow Composite Measure Pain Scale (CMPS-SF). In addition, the time between the end of general anaesthesia and extubation, sternal positioning, attempting to obtain a standing position, and the time of onset of additional side effects were measured and analyzed.

The results of the first stage revealed that the induction of general anaesthesia with the mixture of tiletamine-zolazepam at a dose of 5 mg / kg does not require maintenance of anaesthesia with isoflurane during short and minimally invasive outpatient-surgical procedures in dogs. In order to validate the test results, three "crossovers" were made according to Dixon's Up-and-Down method. In addition, this induction leads to suppression of consciousness and the pharyngeal reflex, allowing for non-problematic intubation of patients.

In the second stage, the author showed that the application of the TIVA protocol with the induction of a low dose (0.5 mg/kg) of tiletamine with zolazepam and the maintenance of general anaesthesia with this mixture in continuous intravenous infusion ensures its stable level while maintaining the reference parameters within the limits: cardiovascular, ventilation and internal body temperature. The respiratory rate initially remained low, increasing over time, but was sufficient to keep the end-tidal CO_2 concentration within normal limits. The heart rate in

the TZ group decreased for the first 20 minutes of the procedure, then remained at a similar level for the next 20 minutes, and then decreased for the last 10 minutes of the procedure. Compared to the P group, the heart rate was maintained at a higher level throughout the duration of anaesthesia, despite these fluctuations. Blood pressure in the TZ group was higher throughout the procedure than in the P group. The body temperature decreased in both groups, but was higher throughout the entire procedure in the TZ group.

The third stage, focusing on the post-anaesthetic and recovery evaluation of the patients, was similar and on a good level in both groups. The use of the TIVA protocol using the tiletamine-zolazepam mixture ensured an adequate level of analgesia during recovery of patients. Two hours after the end of general anaesthesia, all patients from both groups were conscious and were able to stand. None of the patients showed severe pain symptoms that would require rescue analgesia. In the study group, however, the recovery period is longer and less stable than in the control group.

To sum up, the above multi-stage studies using tiletamine and zolazepam, both in the induction itself, as well as in induction and maintenance of anaesthesia, without the use of anaesthetic gases, ensure stable intraoperative conditions. Patients showed appropriate level of anaesthesia and stable parameters during the procedure. The post-anaesthetic period was assessed as good, despite the occurrence of involuntary symptoms. The evaluated protocol in stage I may be useful for minimally invasive outpatient-surgical procedures. In contrast, the protocol assessed in stage II may be useful for long and invasive orthopedic procedures in the pelvic limbs. The entirety of the research has shown that it is possible to maintain stable general anaesthesia both in outpatient and surgical procedures and in more invasive orthopedic procedures without the use of anesthetic gases. In addition, the use of the TIVA protocol with

a mixture of tiletamine-zolazepam is an alternative to inhalation anaesthesia, which will reduce the emission of harmful environmental factors.