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PROCALCITONIN AS A PREDICTOR OF BACTEREMIA IN POSTOPERATIVE CARDIOSURGERY PATIENTS
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Abstract. Purpose of the study: To define diagnostics ability of procalcitonin (PCT) test for prediction of bacteremia of different etiology in cardio-surgical patients. Materials and methods: 10158 pairs of blood examples from cardio-surgical patients in early postoperative period were studied from 2007 to 2012. Results of PCT test were compared with blood cultures. The data is presented as absolute values and proportions. Furthermore a mean and standard error of the mean is presented. Differences in compared groups with \( p < 0.05 \) are considered statistically significant. Results: In average a bacteremia occurred on a 6th day of postoperative period. Frequency of the positive blood cultures was 20.7%. 972 cases of bacteremia (46.2%) was caused by Gram-positive cocci, 702 cases (33.3%) by Gram-negative bacteria and 338 (16.1%) by yeast-like fungi. Mixt-cultures were defined in 93 cases (4.4%). Monocultural bacteremia was analyzed only (\( n=2012 \)). Average level of PCT was higher (statistically significant) in cases with blood cultures than in cases without it (14.35±0.91 ng per ml vs. 7.35±0.26 ng per ml, \( p=0 \)). The highest PCT was fixed in cases of bacteremia caused by Gram-negative bacteria (26.03±2.13 ng per ml). There was no significant difference between bacteremia due to enterobacteria and non-fermenting agents (30.56±4.05 ng per ml \( p=0.07 \)). Statistically significant differences according to the average PCT were defined between bacteremia caused by Gram-negative bacteria (26.03±2.13 ng per ml), Gram-positive cocci (7.24±0.88 ng per ml, \( p=0 \)), Candida species (9.02±1.84 ng per ml, \( p=0 \)), and cases of contamination (9.92±2.79 ng per ml, \( p=0 \)). Average PCT was not significantly different in cases of bacteremia due to coagulase-negative staphylococci (5.94±0.87 ng per ml), S. aureus (4.04±0.9 ng per ml), enterococci (15.72±3.52 ng per ml), Candida species (9.02±1.84 ng per ml), in cases of contamination (9.92±2.79 ng per ml) and in cases of the negative blood cultures (7.35±0.26 ng per ml). According to ROC-analysis the optimal cut-off point for PCT as a predictor of Gram-negative bacteremia was 2.47 ng per ml, AUC 0.7 (95%DI 0.68-0.72). Index of sensitivity was 64%. Conclusions: PCT level in blood plasma of patients with bacteremia higher (statistically significant) than in patients with negative blood cultures. Gram-negative infection is more likely in cases when PCT higher than 2.47 ng per ml.

Key words: cardiac surgery, bacteremia, infectious complications, biomarkers, procalcitonin

AN-1402-010
RISK FACTORS OF POSTOPERATIVE MENINGITIS IN PATIENTS WITH CHIASM-SELLAR TUMORS
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Abstract. Postoperative intracranial infectious complications are one of the most topical problems of neurosurgical intensive care due to theirs significant capability to impair outcomes of the main disease. Purpose of the study: To define the risk factors of postoperative meningitis in patients with chiasm-sellar tumors. Research objectives: 1. to define the effect of somatic and intracranial risk factors on occurrence of postoperative meningitis in patients after transsphenoidal and transcranial approaches to the tumor. 2. To define the effect of postoperative meningitis on outcomes of treatment in patients after transsphenoidal and transcranial approaches to the tumor. Materials and methods: Somatic and intracranial risk factors of occurrence of postoperative meningitis (pneumonia, urinary tract infection, sepsis, intra-abdominal hypertension, the presence of external ventricular and lumbar drainage, monitoring of intracranial pressure, cerebrospinal fluid, and reoperation) were fixed every day. The study was conducted in the ICU of the Burdenko from October, 2010 to July, 2012. The 34 patients (19 males, 15 females) were included in the study (average age 47.5 years). The patients were divided into two groups; 17 patients each group. The group-1 included patients after transcranial approach to the tumor and the group-2 included patients after transsphenoidal approach. Results: In the group-1 a meningitis occurred in 3 patients (17.6%±9.2%, DI [-0.4 – 35.6]). In the group-2 a meningitis occurred in 7 patients (41.2%±11.9) DI95% [17.8-64.4]. Accumulation of cerebrospinal fluid under the skin flap authentically increased a risk of a meningitis occurrence in patients after transcranial approach to the tumor (\( p=0.031 \)). There was no defined statistical significance of other risk factors. But there was defined a trend of the increasing of meningitis occurrence in patients after transsphenoidal approach in case of lumbar drainage or reoperation. Duration of mechanical ventilation and ICU stay in patients with meningitis was authentically longer than in patients without meningitis in both groups. In the group-2 the duration of mechanical ventilation and ICU stay was significantly shorter than in the group-1. Conclusions: Meningitis is not a typical complication of postoperative period in patients with transcranial approach to the tumor. After transsphenoidal approach a meningitis occurrence is likely in case of postoperative liquorrea, lumbar drainage or reoperation. Subcutaneous accumulation of cerebrospinal fluid is a single defined statistically significant risk factor of meningitis. Postoperative meningitis impairs a condition of patients with chiasm-sellar tumors, increases the duration of mechanical ventilation and impairs treatment outcomes.

Key words: meningitis, chiasm-sellar tumors, transsphenoidal approach, transcranial approache
CHANGES IN LIPID AND CARBOHYDRATE METABOLISM IN PATIENTS WITH SEVERE SEPSIS OF DIFFERENT ETIOLOGY

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Abstract. Different origin (heterogeneity) of sepsis is a key stone in many discussions regarding options for the course and outcome, despite the general rules of development of the pathogenic mechanisms. Purpose of the study: To compare data of systemic inflammation (CRP, PCT, IL-8, IL-6, IL-4, TNF-α) and markers of endothelial dysfunction (NO, lactate, D-dimers), also lipid (cholesterol, triglycerides, HDL, LDL, VLDL) and carbohydrate metabolism between the two groups of patients with severe intra-abdominal infection (n = 109) and severe sepsis of other etiologies (n = 53). Results: We found out a significant difference between the groups in serum levels of the CRP, IL-4 and cholesterol at all stages of the study. During severe abdominal sepsis was accompanied by a significantly higher level of cholesterol, LDL and VLDL, as well as higher values of glycaemia. Patients with sepsis other etiology showed a lighter and more dynamic course of the disease was significantly lower 28-day mortality.

Key words: severe sepsis, lipid metabolism

SIGNIFICANCE OF STATIC PRESSURE-VOLUME LOOP FOR DIFFERENTIAL DIAGNOSTICS AND OPTIMIZATION OF RESPIRATORY SUPPORT IN PARENCHIMAL RESPIRATORY FAILURE

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Abstract. Aim of the study was to determine significance of static pressure-volume loop (PV loop) for differential diagnostics of parenchymal respiratory failure, setting of positive end-expiratory pressure (PEEP) and recruitability of the lung.

Methods: We include 76 patients (52 males) with parenchymal respiratory failure (oxigenation index (PaO2/FiO2)<250 torr, infiltrates on chest X-ray or CT-scan of the lungs, no data on left ventricular failure). We plot static PV loop by low flow technique in range of 0 to 40 mbar, fixing lower inflection point (LIP), linear compliance (Clin), upper inflection point (UIP), expiratory inflection point (EIP), compliance of linear deflation limb (C defl), hysteresis (Hyst) and volume of PEEP-induced recruitment of the lung (Vpeep). Then we plot another static PV loop with sustained inflation of 40 mbar for 30 seconds, fixing changes in lung volume at 40 mbar. After 10 minutes of sustained inflation we measured changes of oxigenation index. For 69 patient we performed lung CT-scan and defined diffuse (acute respiratory distress syndrome) or local lung injury (pneumonia, atelectases).

Results: LIP value can differentiate diffuse and local lung injury. LIP more than 10 mbar corresponds to diffuse lung injury on CT scan (sensitivity 76%, specificity 85%, AUROC 0.81). LIP cannot predict PEEP-induced alveolar recruitment and changes of PaO2/FiO2 after sustained inflation maneuver (p > 0.05). Empirically set PEEP (by maximum PaO2/FiO2) was much higher than LIP (p < 0.0001), but LIP correlates with empirically set PEEP in diffuse lung injury (rho = 0.642, p = 0.003). Clin cannot differentiate diffuse from local lung injury (p > 0.05), but predicts PEEP-induced alveolar recruitment during static PV loop plotting (rho = 0.493, p < 0.0001). We didn’t find any statistically significant values of UIP and EIP for differential diagnosis, setting of PEEP or recruitability of the lung. Hysteresis value (defined as volume difference at 20 mbar between deflation and inflation limbs) cannot predict influence of PEEP setting and sustained inflation maneuver on PaO2/FiO2 changes and recruitability of the lung (p > 0.05). After static PV loop plotting combined with sustained inflation maneuver recruited volume of the lungs was 350 (250--450) ml. We didn’t find significant differences between recruitability of the diffuse and locally injured lungs (p > 0.05). Recruitment volume has no correlations with all points and segments of static PV loop.

Conclusion: Static PV loop has limited prognostic value for differential diagnostics of diffuse or local lung injury and brings potential harm for setting PEEP according to LIP. LIP more than 10 mbar can predict diffuse lung injury. Clin can predict volume of PEEP-induced recruitment. In diffuse lung injury LIP correlates with empirically set PEEP.

Key words: mechanical ventilation; acute respiratory distress syndrome; static pressure-volume loop; lung CT scan; lower inflection point; compliance.

MODERN GLOBAL TENDENCIES IN THE RESEARCH AND PRACTICE OF PAIN TREATMENT

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Abstract. In recent days there are two main conceptions of the treatment of strong pain. The first conception is a system multimodal analgesia and the second is a multidisciplinary therapy including invasive techniques (local nervous blockades, neuroaxial blockades, neurostimulating or drug therapy with implanted systems
etc.), physical, manual, and psychological effecting on peripheral and central nervous system. A physician (anaesthesiologist, oncologist, neurologist etc.) treats the pain according to interests of a patient. Multidisciplinary pain treatment, which is recommended by the American Pain Association, requires the use of special equipment for effecting on nervous system of the patient and contains conflict of interests of managers, medical workers, equipment providing companies and other parts of the multidisciplinary process. Therefore there is a risk that commercial benefit can get a main role in the process of pain treatment, but not interests of the patient. The "industrial" approach in the pain treatment is connected with many negative outcomes such as a minimizing of the role of pain science, increasing of complications risks due to invasive techniques of the pain relief etc. Therefore an objective analysis of pain treatment outcomes is needed. Helsinki Declaration of a patient safety in surgery approved by European Society of Anaesthesiology in June, 2010 requires an accounting system of critical incidents, complications and assessment of outcomes in perioperative anaesthesiological practice. The same study is very actual for Russia especially to compare a safety of the system multimodal anaesthesia/analgesia and epidural blockades in major surgery.

Key words: pain, analgesia, multidisciplinary therapy, regional blockades, opioids, safety

AN-1402-032
PAIN RELIEF ASSESSMENT IN PATIENTS HAVING BEEN USED DIFFERENT MULTIMODAL ANALGESIA VARIANTS AFTER MAJOR GYNECOLOGY SURGERY
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Abstract: The major gynecology surgery generally results in severe postoperative pain. Currently multimodal analgesia concept is widely used for the aim of postoperative pain relief optimization. According to this theory it is worth using the medication with different mechanism in order to increase analgesia quality, decrease analgesic consumption and avoid adverse reaction. Unfortunately the surveys recently conducted have been pointed out the postoperative analgesia quality is still insufficient despite of using the concept mentioned above. One way to solve the problem is appearing in daily practice nefopam -- centrally acting non-opioid analgesic that inhibits reuptake of serotonin, norepinephrine, dopamine and also mitigates glutamatergic neurotransmission. In this trial we tried to assess the postoperative daily used analgesia quality and potency of preemptive multimodal analgesia model consisted of nefopam, ketoprofen, paracetamol and morphine.
Key words: pain; pain relief; hysterectomy; multimodal analgesia; hyperalgesia; nefopam; ketoprofen; paracetamol; morphine.

AN-1402-037
COMPARISON OF DEXMEDETOMIDINE AND PROPOFOL FOR SHORT-TERM SEDATION IN THE EARLY POSTOPERATIVE PERIOD AFTER CARDIAC SURGERY
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Objective: to compare the efficacy of Dexmedetomidine and Propofol for short-term controlled sedation and analgesia in the early postoperative period after cardiac surgery.
Methods: we performed open randomized prospective comparative study in 55 cardiovascular surgery patients. In the early postoperative period 28 patients received infusion of Dexmedetomidine (0.2–0.7 μg/kg per hour) while 27 patients -- Propofol (0.3–2 μg/kg/hr). Analgesia was carried out with Ketoprofen 100 mg/12h and additional 20 mg of Trimeperidine in case of pain intensity ≥ 3 points (5-level verbal pain score). Sedation and agitation level (RASS scale), speed of awakening (Aldrete score), duration of mechanical ventilation and stay in the ICU, need for additional opioid injections, type and frequency of side effects were evaluated.
Results: We didn’t find any significant differences in the duration of mechanical ventilation or rate of awakening after the end of infusion between the groups. Dexmedetomidine in the majority of cases resulted in mild or moderate sedation, Propofol -- in deeper level of sedation. Retrograde amnesia was reached significantly more often (p<0.05) in Dextemetomine group. The daily dose of Trimeperidine in Propofol group was significantly higher (8 mg and 18 mg on average, p = 0,02). Differences in side effects between the groups were noted - bradycardia (Dextemetomine -- 10(39%), Propofol -- 3 (11%), p = 0,004) arterial hypotension (Dextemetomine -- 9 (32%), Propofol -- 15 (59%), p = 0,002) and general malaise (Dextemetomine -- 2 (7%), Propofol -- 6 (24%), p = 0,001). The length of stay in the ICU in Dextemetomine group was significantly lower (1,1 days vs 2,6 days respectively, p = 0,006).
Conclusions: To compare with Propofol Dextemetomine induces less sedation level and more often provides retrograde amnesia with the same duration of mechanical ventilation and awakening rate. Dextemetomine provides its own analgesic effect and shortens the length of patient's stay in ICU. Bradycardia was noted more frequently in Dextemetomine while arterial hypotension, general malaise and delirium -- in Propofol group.
Key words: sedation, dexmedetomidine, propofol, cardiac surgery
ROLE OF A MIGRAINE HISTORY IN THE DEVELOPMENT OF POSTOPERATIVE NAUSEA AND VOMITING IN PATIENTS UNDERGOING GENERAL AND COMBINED GENERAL-EPIDURAL ANESTHESIA

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Abstract. Purpose of the study: To assess the role of migraine history in the development of postoperative nausea and vomiting (PONV) in patients undergoing general and combined general-epidural anaesthesia. Materials and methods: 127 women with oncogynecological pathology were randomized into 3 groups according to anaesthesia method. Patients of the group C (comparative group; n=43; 18 with migraine) received general anaesthesia. Patients of the Group CA (n=40; 19 with migraine) received combined general-epidural anaesthesia. Patients of the group D (n=44; 19 with migraine) received general anaesthesia with adding of Droperidolum. All patients received standard prophylactics of PONV – Ondansetronum 8 mg and dexamethasone 8 mg intravenous. Results: In the group C a PONV occurred in 15 of 43 women (34.9%). PONV occurred in 6 of 18 women with migraine (33.3%) and in 9 of 25 women without migraine (36%). In the group CA a PONV occurred in 10 of 40 women (25%). PONV occurred in 8 of 19 women with migraine (42.1%) and in 2 of 21 women without migraine (9.5%; p=0.036 in comparison with group C). In the group D a PONV occurred in 8 of 44 women (18.2%). PONV occurred in 1 of 19 women with migraine (5.3% p=0.03 in comparison with group C and p=0.008 with group CA) and in 7 of 25 women without migraine (28 %; there was no significant difference with groups C and CA). Conclusions: Migraine history is a significant risk factor of PONV. Epidural component of anaesthesia does not effect on frequency of PONV in women with migraine, but Droperidolum use allows increasing the frequency of PONV.

Key words: oncosurgery, postoperative nausea and vomiting, migraine, antiemetic, combined anaesthesia, droperidolum

FEATURES OF MAXILLARY AND MANDIBULAR NERVES IMAGING DURING STEM REGIONAL BLOCKADES. FROM PARESTHESIA TO 3D-CT GUIDANCE

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Abstract. There are difficulties in procedure of regional block of 2 and 3 branches of the trigeminal nerve despite availability of many different methods of nerves imaging. The difficulties are connected with complex anatomy structure. Neurostimulation not always effective and, as a rule, is accompanied with wrong interpretation of movement response on stimulation. The changing of the tactics on paraesthesia search improves the situation. The use of new methods of nerves imaging (3D -CT) also allows decreasing the frequency of fails during procedure of regional block of the branches of the trigeminal nerve.

Key words: nerves imaging, neurostimulation, ultrasound guidance, combination of ultrasound guidance with neurostimulation, local anaesthetics, lidocaine, bupivacaine, Voino-Yasenetsky paraoorbital blockade, Whiceblat subzygomatic blockade, paraesthesia, muscle response, regional block, trigeminal nerve, Gasser node block, "pin-prick" test, 3D-CT guidance, anatomical deformations of viscerocranium

APPLICATION OF EXOGENOUS SURFACTANT AND RECRUITMENT MANEUVER IN NEWBORNS WITH RESPIRATORY DISTRESS-SYNDROME

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Abstract. Respiratory distress-syndrome (RDS) in newborns is a one of the most frequent critical conditions of neonatal period requires the use of invasive methods of respiratory support. Purpose of the study: To define an efficiency of complex application of exogenous surfactant and recruitment maneuver in newborns with RDS. Materials and methods: 30 newborns with RDS and progressive hypoxemia were included in the study. Average mass of body was 1575 grams. In 11 newborns RDS was accompanied severe hypoxemia and required the application of recruitment maneuver and exogenous surfactant administration. Results: Application of recruitment maneuver with exogenous surfactant administration allow to improve gas exchange and blood oxygenation in newborns with RDS (PaO₂ 54 vs 39 mmHg; SpO₂ 95 vs 90% and blood pH 7.34 vs 7.28). Application of recruitment maneuver with exogenous surfactant administration decrease number of complications and improve outcomes.

Key words: alveoli recruitment maneuver; exogenous surfactant; respiratory distress-syndrome; newborns;
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COMPARATIVE DATA ABOUT CRYOSUPERNATANT AND FRESH FROZEN PLASMA USE IN TREATMENT OF DISSEMINATED INTRAVASCULAR COAGULATION IN PATIENTS WITH GENERALIZED PERITONITIS
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Abstract. Purpose of the study: To compare the complex treatment of peritonitis with cryosupernatant and with fresh frozen plasma. Materials and methods: Outcomes of treatment were studied in 88 patients receiving cryosupernatant and in 112 receiving fresh frozen plasma. Results: Cryosupernatant application provides better dynamics of hemostasis, decreases a risk of thrombosis and mortality and improves outcomes of treatment. Conclusions: Cryosupernatant can be used instead of fresh frozen plasma in complex treatment of disseminated intravascular coagulation in patients with generalized peritonitis.

Key words: peritonitis, fresh frozen plasma, cryosupernatant, disseminated intravascular coagulation

AN-1402-056
CAUSES AND PATHOGENESIS OF HYPOCOAGULATION IN RECONSTRUCTIVE MAXILLOFACIAL SURGERY
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Abstract. Anaesthesia for reconstructive maxillofacial surgery can be accompanied with a significant hypocoagulation and blood loss. Possible causes of a hypocoagulation are dilution coagulopathy and disseminated intravascular coagulation. Coagulograms analysis showed that all patients have disturbances of blood clotting system. The main cause of a hypocoagulation is a disseminated intravascular coagulation.

Key words: reconstructive maxillofacial surgery, hypocoagulation, disseminated intravascular coagulation, hyperfibrinolysis, dilution coagulopathy, tranexam, aprotinine, infusion therapy, transfusion therapy

AN-1402-059
ANTIFIBRINOLYTIC PROPHYLAXIS TO REDUCE BLOOD LOSS AND ALLOGENIC BLOOD TRANSFUSION FOR ADULTS UNDERGOING CARDIAC SURGERY.
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Abstract. Significant bleeding during cardiac surgery, enough to cause re-exploration and/or blood transfusion, increases morbidity and mortality. Bleeding after cardiopulmonary bypass is related to multiple factors: endothelial dysfunction, thrombocytopenia, dilutional coagulopathy. Hyperfibrinolysis is one of the important contributors to increased bleeding. To compare the effect of aprotinin with the effect of lysine analogues (aminomethylbenzoic acid and epsilon aminocaproic acid) examined 63 patients were divided into three equal groups depending on the product used for the prevention of activation of fibrinolysis. Data from rotational thromboelastometry measurements (Rotem Gamma Pentapharm, Germany), blood loss and transfusion were collected.

The results confirm that used in the study antifibrinolytics: the lysine analogues aminomethylbenzoic acid and epsilon aminocaproic acid prevent hyperfibrinolysis after cardiopulmonary bypass as well as aprotinin.

Key words: cardiopulmonary bypass; ROTEM; aminomethylbenzoic acid; epsilon aminocaproic acid; aprotinin.

AN-1402-064
PULMONARY ARTERY CATHETERIZATION IN PATIENTS WITH BLOOD DISEASES
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Abstract. Purpose of the study: To analyze complications of the pulmonary artery catheterization in patients with blood diseases. Materials and methods: 93 cases of pulmonary artery catheterization in patients with blood diseases were included in the retrospective study. Results: Indications for pulmonary artery catheterization were septic shock (78.5%) and acute respiratory failure (21.5%). In 31 cases (33.3%) pulmonary artery catheterization was performed in conditions of agranulocytosis and in 81 cases (87%) in conditions of thrombocytopenia (platelets median 43×109 per liter, minimal 7×109, maximal 150×109 per liter). Patients received transfusions of platelets in case of thrombocytopenia less than 30×109 per liter. Early complications of pulmonary artery catheterization occurred in 5 patients with thrombocytopenia (5.4%), the complications was connected with bleeding (hematoma, bleeding from place of puncture, lung bleeding) and mechanical (arterial puncture, pneumothorax, hemothorax). Number of attempts of the central vein catheterization was risk factor the complications. The frequency of catheter-associated sepsis was 5.89
cases each 1000 catheter-days and the frequency of infections of the soft tissues was 9.78 cases each 1000 catheter-days. Catheter-associated infection complications occurred in cases of catheter use over 5 days. Catheter-associated sepsis occurred in 2 of 3 patients with agranulocytosis. Other complications included intermittent arrhythmias during catheter moving in the heart chambers (58), catheter balloon rupture (4), and thrombosis of catheter lumen (3). Conclusions: Pulmonary artery catheterization can be used in patients with blood diseases and first of all in cases of septic shock and acute respiratory failure. Alternative less invasive methods of monitoring should be used in patients with agranulocytosis.

**Key words:** pulmonary artery catheterization, thrombocytopenia, agranulocytosis, catheter-associated sepsis, blood diseases

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AN-1402-070

**DEFECTS OF ANASTHESIA AND INTENSIVE CARE (BASED ON FEE Forensic Medical Examination)**

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**Abstract.** This article is dedicated to an extremely topical problem of the patient safety in anesthesiology and intensive care. The medical help complications and defects issue in anesthesiologist practice has not only specifically medical, but also social significance. The analysis of frequency and nature of defects in anesthesiology and intensive care was conducted. It was based on 280 forensic medical examinations with anesthesiologist as an expert. The acquired data showed that treatment defects were found in 63.7% of cases. Special attention was paid to airway management defects.

Results helped to determine at which stage and procedure the critical incidents had occurred, as well as their frequency and causes. Considering the discovered causes of defects in anesthesiology and intensive care, measures aimed at preventing complications and increasing the anesthesiology and intensive care quality were proposed.

**Key words:** patient safety; anesthesia; intensive care; critical incident; human errors; forensic medical examination.