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Critical overview

Forensic in obstetrics anesthesia

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Abbreviations:
IV – intravenous
HBV – hepatitis B virus
HCV – hepatitis C virus
HIV – human immunodeficiency virus

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INTRODUCTION

Obstetric anesthesiology is a complex subspecialty arising from general anesthesiology due to physiological and pathophysiological specifics of pregnancy, delivery, postpartum period, fetus and newborn. Hemorheological physiological events during the aforementioned states, such as hypercoagulability, physiological hemodilution, gestational anemia, existence of one or more beings and their biological characteristics, alter the common anesthesiology and reanimation procedures. Frequent urgent states (hemorrhage arising from placenta abruption, placenta previa, obstetric shock, obstetric embolism, disseminated intravascular coagulopathy), frequently unprepared urgent patient (prior food consummation, adiposity, frequent comorbidity – gestational diabetes, hypertension / preeclampsia, obstetric-intrauterine infection) and medicaments (insulin, antihypertensive drugs, low-molecular-weight heparin, antibiosis) constitute a significant clinical risk. This appears on a daily basis in the work of large clinics and requires constant cooperation between anesthesiologists and obstetricians, neonatologists, transfusion medicine specialists, anesthesiology technicians, nurses and midwifes. The sensitivity of the population (pregnant women and unborn children) significantly burdens the system as a whole, and mutual interpersonal communication and organization is of direct importance for a good perinatal outcome *(1–3)*.

Obstetrics is a high-risk profession and the profession with the highest number of claims for damages on a global scale. The most common reasons include: long-term neuromotor disorders (cerebral palsy) arising from perinatal hypoxia, shoulder dystocia, tear of soft birth canal of III. and IV. degree, scar tear after prior cesarean sections, breech birth complications, obstetric shock *(4)*.

Due to the aforementioned facts, obstetric anesthesia, along with obstetrics, is referred to as a profession of a very high forensic risk, which is proved by a significant number of lawsuits and claims for damages in obstetrics in Croatia and worldwide. Thus, forensic obstetrics has developed, which, along with forensic anesthesiology, frequently participates in developing medicolegal (forensic) expertise and interpretations *(5, 6)*. Jena *et al. (7)* state in their paper that in 1975 from the overall number of lawsuits in Florida 35 % were related to obstetricians and anesthesiologists, 48 % to surgical professions and 15 % to internal medicine professions. Between 1991 and 2005 there was around 7 % claims for damages, i.e. lawsuits, while 12 % of lawsuits related to obstetrics. According to this research, the amount of more than $ 360,000 of claims for damages was attributed to obstetrics, while this amount related to anesthesiology amounted to $ 290,000. However, it was not specified how much referred to the subspecialty of obstetric anesthesiology, although a high frequency of verdicts for damages in both specialties may be observed.

PROBLEMS IN FORENSIC OBSTETRIC ANESTHESIA

Sudden deaths during surgeries arising from cardiac arrests, anesthesiological logistics (pain killers, inadequate devices, anesthesia being performed by anesthetic technicians), consequences of septic criminal abortions with multiorgan failure and the inability of administering uterotonics in obstetric hemorrhage (e.g. in 1939) due to non-existence of pitocin and development of obstetric shock were, unfortunately, a matter that occurred on a daily basis that was reported on at conferences of clinical and judicial pathologists *(8, 9)*. Many deaths arising from surgical and diagnostic procedures, transfusion complications, stomach content aspiration were described, which was accompanied by judicial-medical discussions *(8, 9)*.

Today invasive malplacentation arising from recurrent and irrationally increased number of cesarean section as an isolated and main risk factor may cause, due to mutilating interventions in pelvic space, numerous anesthesiological and reanimation procedures that, along with surgical procedures performed by obstetricians (hysterectomy, bladder resection, parametria, stitches on large pelvic blood vessels etc.) require a strong cooperation between obstetricians and surgeons. Multiple and massive transfusions of blood and blood derivatives, IV solutions, fibrinolysis inhibitors (tranexamic acid) etc., along with hemodynamic monitoring, belong to constituent procedures of resuscitation and maintaining the perfusion of vital organs and preventing early and late consequences of obstetric shock. Furthermore, multiple pregnancies, especially after the delivery of the first twin and the need for obstetric operation (internal turn and extraction in transverse / diagonal position of the second twin) require coordination and communication within the obstetric--anesthesiological team and rapid action *(10, 11)*. Therefore, hospitals with high-risk pregnant women population in which intrapartal complications such as the ones previously described, should have a constant and available anesthesiology service at the department of obstetrics. Anesthesiologist's constant presence in delivery rooms with a large number of deliveries allows for, along with making the delivery less painful by means of epidural analgesia, the possibility of taking action in urgent interventions, such as urgent cesarean sections in the delivery compartment (room) in women who are in epidural analgesia or urgent general endotracheal anesthesia, providing there are smaller mobile anesthesiology devices, such as the one at the Anesthesiology Clinic of the Clinical Hospital "Sveti Duh" in the delivery room. 1-3 cesarean sections (crush caesarean section) are yearly performed in the delivery compartment due to vital (maternal or fetal) indications for the purpose of literally saving the life of a mother or child, i.e. both of them. I point to the example of cardiovascular arrest in a gravida 3 who, after amniotomy, developed cardiorespiratory arrest. In the delivery compartment the child's life was saved by "*sectio in moribunda*" intervention, while the mother, after intubation, was in severe obstetric shock with the development of a severe form of disseminated intravascular coagulation and was actually only oxygenated, without anesthetics. Due to severe hemorrhage a compressive uterus suture according to B-Lynch was performed and the procedure was completed. Upon reanimation procedures, hemodialysis and mechanical ventilation the mother got better after clinically and biochemically (coagulation) proved obstetric embolism.

Other complications that may be qualified by errors arising from possible sufficient inattention have been

TABLE 1

Former and current possible anesthesiological and obstetric risk factors.

Former anesthesiological and obstetric risk factors	Current anesthesiological and obstetric risk factors
Criminal abortions	Preeclampsia
Sepsis (septicaemia)	Hemorrhage during and after delivery
Uterus perforation	Disseminated intravascular coagulopathy
Peritonitis	Multiorgan failure
Obstetric hemorrhage	Obstetric embolism
Obstetric shock	Obstetric shock
Uterus tear	Invasive malplacentation
Inadequate logistics	Recurrent cesarean section
Unavailability of blood transfusion derivatives	Pain
Anesthesia being performed by anesthesiological technicians	Multiple pregnancy
	Treatment in the Intensive Care Unit
	Obstetric hysterectomy
	Obesity
	Recurrent reception to delivery room and recurrent surgical procedures
	Complications related to general or regional anesthesia
	Waiting from caesarian section >20 min
	Waiting for laboratory findings
	Waiting for blood preparations
	Laboritis
	HBV, HCV, HIV infection
	Interpersonal conflict
	False medication
	Anaphylaxis
	Hospital infection
	Breech of professional guidelines
	Communication errors
	Administration errors

described, e.g. local patch allergy due to IV fixation when a postpartum woman was acknowledged the damage amounting to] 3,000 *(12)*. Based on organizational reasons (lack of anesthesiologists, customs, "hospital house rules"), it is usual that in smaller gynecological procedures the gynecologists first administers intravenous analgosedation in various modifications (petantin, petantin + diazepam, pentazocine + diazepam etc.), which may cause possible undesired complications, even consequences arising from negligence, such as secondary apnea, and patients are usually not monitored. Thus, German authors have warned against organizational and professional errors in endoscopic surgeries when a single physician simultaneously administers analgosedation, and subsequently performs examination, i.e. procedure, and described complications such as breathing depression after a propofol injection and heart failure after propofol during gastroscopy *(13)*. In Croatia the problem is even greater, because physicians delegate this kind of intravenous analgosedatian to a nurse who finished secondary medical school, whereas current legislative states that only physicians are allowed to administer intravenous injections, with the exception of intensive care units where Bachelor degree nurses are allowed to do this as well. In specialized medico-legislative journals forensic elaborations based on casuistry are published, so changes in some guidelines and understanding of certain problems arise *(14)*.

DISCUSSION AND CONCLUSION

During all anesthesiological and obstetric procedures, parturient women / pregnant women / patients / postpartum women must be informed and sign an informed form for all diagnostic, anesthesiological and surgical procedures, except in cases when they are in unconscious and / or vitally threatened state. These constituents are a part of the Declaration on Patients' Rights that promotes the following rights: right to health care, right to dignified procedure, right to be informed, right to informed consent, right to refuse treatment, right to the freedom of selecting a physician, right to participate in decisions related to health care, right to appeal and right to die with dignity *(15)*. Informed consent should be insisted upon according to valid laws and regulations, especially while performing a procedure "upon patient's request", namely: cesarean section upon request (which does not exist as an option in Croatia) and artificial abortion due to possible legislative implications of performing the procedure and anesthesia and possible postoperative complications, which has been a common procedure in the world for a long time *(16)*. Recently, a lot of attention has been given to palliative care and solving psychogenic pain in all its forensic components: risk factors (psychiatric, psychological, personal, social and historical) as well as organizational factors *(17-19)*.

It is suggested to perform a quality preoperative anesthesiological anamnesis and examination, classification according to ASA levels, adequate premedication and medication in comorbidity, performing regional or general anesthesia and reanimation and intensive-therapy procedures by well trained anesthesiologists and intensive care specialists, which evidently reduces the number of forensic cases. It is especially necessary to develop the subspecialty of obstetric anesthesia in areas in which it is not independent and is unified with general anesthesiology and reanimatology *(2, 3, 20, 21)*. Medical law defines the difference between medical error and medical complication, categorizes an undesired event as a complication / error in diagnosis, treatment or rehabilitation, organization and communication, and thereby it clearly distinguishes between a harmful non-accidental event and an error, which consequently has significant medicolegal implications *(22)*. The ethical-deontological component in medicolegal (forensic) medicine is inseparable and should be followed in all principles *(19, 23)*.

On the other hand, anesthesiological and obstetric staff are subjected to a very high health-related risk, from accidental infections *(24),* constant exposure to stress, urgent surgical and reanimation procedures, resulting in unexpected and undesired events with a negative perinatal outcome, which is connected with pre-investigative and investigative procedures within and outside the institution performed by criminalist entities *(25, 26)*. This underrates the work itself and requires even greater investments and psychophysical efforts of staff as a whole.

Constant education and training of all staff who participate in obstetric anesthesiology, obstetrics and midwifery reduce clinical risk (Table 1) related to the components that mostly may be affected. However, the course of some events and illnesses that is determined by fate will not be possible to influence and there will always be a risk of undesired events. Our task is to ensure that such events are reduced to the lowest amount possible by means of aforementioned actions. Furthermore, it is crucial that medical error is not interpreted as a complication and vice versa, which is more usual in Croatia, that complications are not interpreted as medical error. Such forensic deliberation shall restore and secure the dignity of the profession, allow for progressive professional and scientific development and ensure the safety of health care staff and pregnant women / parturient women / postpartum women, born and unborn children who are the purpose of us being here.

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