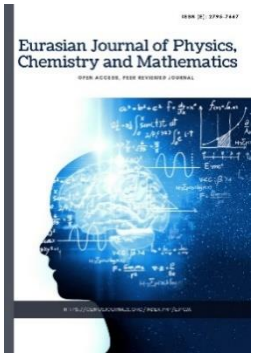


# New Opportunities in Dexmedetomidine Acoustic Anesthesia

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**ABSTRACT**

The problem of anesthesia for delivery in the abdominal cavity has long been solved. At the same time, spinal (SA) and epidural anesthesia (EA), as well as general multicomponent anesthesia (GA) with mechanical ventilation are used as anesthetic assistants [1]. Each of these methods has its advantages and disadvantages, indications and contraindications. In modern obstetrics, the choice of anesthesia for caesarean section is of particular importance, as it should contribute to adequate protection of the pregnant woman from surgical stress and create optimal conditions for the adaptation of the fetus in the perioperative and neonatal period.

**Keywords:**

**Enter.** The problem of anesthesia for delivery in the abdominal cavity has long been solved. At the same time, spinal (SA) and epidural anesthesia (EA), as well as general multicomponent anesthesia (GA) with mechanical ventilation are used as anesthetic assistants [1]. Each of these methods has its advantages and disadvantages, indications and contraindications. In modern obstetrics, the choice of anesthesia for caesarean section is of particular importance, as it should contribute to adequate protection of the pregnant woman from surgical stress and create optimal conditions for the adaptation of the fetus in the perioperative and neonatal period. In modern obstetrics, the anesthesiologist plays a larger role than simply providing anesthesia for caesarean section and postpartum care [2]. Caesarean section is one of the most common birth operations used in obstetric practice. The frequency of this delivery operation is increasing all over the world, including in the Republic of Uzbekistan. The problem of sedation in obstetric intensive care units is undoubtedly of scientific and practical importance [3]. Sedation can reduce the risk of congenital complications and allow patients to recover more quickly.Most often, a component of drug sedation is a local blockade performed by an anesthesiologist, because an important task of sedation is to achieve and maintain a level of anesthesia that eliminates involuntary movements and increases in blood pressure, heart rhythm disturbances, and timely treatment. [4]. Almost all patients in the intensive care unit are adequate for various reasons, including the need for invasive procedures, disruption of sleep and wake rhythms, the severity of the general condition and the need for respiratory support. level requires sedation [5].

Dexmedetomidine can probably be called the newest drugs used for sedation in anesthesiology and intensive care practice. Chronologically, although it was first registered in the USA in 1999 under the trademark Precedex® (Hospira Inc, USA), the process of approval of clinical use of the drug in Europe and Russia was extended to 2011 and 2012.

Pharmacological properties of dexmedetomidine. In particular, drugs from the group of α2-adrenomimetics, including dexmedetomidine, have long occupied a special place in the arsenal of anesthesiologists and resuscitators [6]. The effect produced by drugs of this group is complex and changes the performance parameters of many organs and systems. This type of effect, as is clear from the name of the pharmacological group, is associated with stimulation of α2-adrenergic receptors.These receptors include several subtypes, among which mainly α2A-, α2B- and α2C-receptors are distinguished. α2A adrenergic receptors are located mainly in the brain, mainly presynaptically in nerve endings. When these receptors are stimulated, the activity of adenylate cyclase in cells increases, which leads to a decrease in the flow of Ca ions to the nerve endings. This in turn suppresses the release of norepinephrine into the synaptic cleft [5]. Clonidine was the first drug from the group of α2-adrenomimetics introduced into clinical practice in the 60s of the twentieth century [6]. Initially, it was considered only as an antihypertensive agent, but relatively quickly indications began to appear due to a number of concomitant properties of clonidine, which are useful in the practice of anesthesiologists. It is known that, in addition to the hemodynamic effect on the patient, which determines the indications for its use today, it reduces the need for clonidine, has a sedative effect, eliminates anxiety and postoperative pain. reduces tremors during the period [4]. The effect of dexmedetomidine is primarily related to the stimulation of α2A adrenergic receptors located in the locus coeruleus region of the brain stem. This effect disrupts adrenergic transmission along ascending nerve fibers in the ventrolateral preoptic nucleus (VLPO) of the thalamus, which in turn leads to the activation of GABAergic inhibition of the tuberomammillary nucleus (TMN) projecting from this nucleus. As a result, the severity of histamine-mediated activation of the cortex associated with the latter decreases [3]. Researchers say that it is through this system that the mechanism of natural slow-wave sleep is implemented [8]. The clinical significance of the analgesic effect of dexmedetomidine is also a topic for further study. A series of studies with systemic administration of dexmedetomidine to volunteers gave satisfactory results [9]. The apparent differences in the results of these two well-conducted studies should not be misunderstood: it can be argued that dexmedetomidine infusion does not reduce pain sensitivity, but rather alters the patient's response to pain through anxiolysis. Such an effect, that is. Increased tolerance, but not pain threshold, may explain the described decrease in the need for opioids in patients in the postoperative period and / or in the intensive care unit [10]. Regarding the analgesic properties of dexmedetomidine, it should be noted that α2-adrenergic agonists a lot of evidence has been collected on neuraxial (epidural and intrathecal) effects [3].

Hemodynamic effect.Like all α2-adrenergic agonists, the hemodynamic effect of dexmedetomidine is biphasic. The use of dexmedetomidine in therapeutic doses (in the form of infusion) leads to a decrease in systolic and diastolic blood pressure [5], and the estimated vascular resistance does not change. However, with a sharp increase in the concentration of dexmedetomidine in the blood (for example, as a result of a bolus injection) or with a high-speed infusion, on the contrary, an increase in blood pressure is observed [4]. with a predominant effect of the drug on peripheral adrenergic receptors in the vessels, rather than central. The potential cardioprotective effect of dexmedetomidine for patients with cardiovascular pathology can be discussed, since postoperative stress and associated tachycardia and hypertension pose a high risk for this category of patients [6].

Effects on the respiratory system. Many modern anesthetic drugs, their effect is carried out through GAMK-ergic transmission in the brain,

in particular, propofol, benzodiazepines, barbiturates cause a dose-dependent breathing. A fundamentally different mechanism of the sedative effect of dexmedetomidine, which is related to the adrenergic pathway of activation of the cortex, explains the absence of such an effect when used [4]. a 10-fold increase in therapeutic doses did not decrease satiety in deep sleep patients [6]. Use of dexmedetomidine in clinical practice

Anesthesiological support in obstetrics has special requirements: it is necessary to protect the mother's body from surgical trauma and at the same time to prevent negative effects on the fetus, as much as possible to preserve its adaptive-regulatory mechanisms responsible for postpartum adjustment. 2]. The listed properties of dexmedetomidine have aroused great interest in it as a sedative drug in intensive care units, first of all, in obstetrics. There are clinical studies on the efficacy and safety of intravenous dexmedetomidine in caesarean section surgery [5]. In this regard, the aim was to study the effect of dexmedetomidine on the mother's vital organ systems and neonatal outcomes in the early neonatal period during cesarean section under spinal anesthesia in pregnant women with preeclampsia. To date, several studies have been conducted to evaluate the effectiveness of this drug for sedation in pregnant women during labor, according to the authors. All the possibilities of using dexmedetomidine described above, including the absence of negative effects on the respiratory system, cardiovascular system, the fetus, prevention of cognitive dysfunction after surgery, and reduction of the need for narcotic analgesics after surgery. For us, there is no doubt that it is an area in obstetric anesthesiology that has potential as an optimal sedative drug. Dexmedetomidine allows to achieve clear anxiolysis while maintaining respiratory function. In addition, this drug has the property of reducing the secretion of salivary glands, which helps to ensure high-quality visual control of manipulation. These theoretical assumptions have also been confirmed in clinical studies [12]. Propofol and benzodiazepines, traditionally used in such cases, are known to cause significant respiratory depression, increasing the risk to the patient. However, many clinical studies confirm the safety and high efficiency of dexmedetomidine in a number of clinical situations. In obstetric practice studies, the use of dexmedetomidine can reduce postoperative cognitive dysfunction in a comparative perspective. Thus, this approach may lead to early awakening and therefore early control of postoperative cognitive status, which has recently received more attention in the sense of preventing worsening of the patient's condition with the development of postoperative complications.

Summary. To summarize our brief review, it should be emphasized once again that despite the current guidelines for the use of dexmedetomidine, its specific properties have the potential to improve the quality of anesthesiological care in obstetric practice. The use of dexmedetomidine for sedation under spinal anesthesia has several advantages for the mother, fetus, and child.Its use has a beneficial effect on reducing the frequency of cognitive impairment in the early postoperative period, reducing the intensity of pain, and improving recovery and activation after surgery. The obtained results allow to recommend dexmedetomidine as the main sedative drug in terms of safety for the fetus and newborn. The combination of a very effective anxiolytic effect with increasing pain tolerance and maintaining respiratory function makes this drug unique in the anesthesiologist's arsenal. Undoubtedly, the collected clinical data allow us to draw a final conclusion about the clear advantage of dexmedetomidine over other anesthetics in each specific clinical situation, but based on them, we can say with confidence that in the future dexmedetomidine will take its place in the practice of anesthesiology.

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