

Neuraxial Anesthesia for Covid-19 Parturients

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Abstract

This is a retrospective non-randomized study in which the clinical experience of neuroaxial anesthesia of 44 cases for COVID-19 parturients is presented. All parturients were with mild or no symptoms of COVID-19. Neuroaxial anesthesia (labor epidural and spinal for cesarean section) provided with keeping of infection safety for personnel and patients. No complications had been seen. Neuroaxial anesthesia for parturients with non-sever COVID-19 is safe and can be provided with same indications as for non-infected parturients.

Keywords: COVID-19; Cesarean Section; Labor Epidural; Spinal Anesthesia

Introduction

During the recent two years health workers are concerning around the COVID-19 pandemic. Cases of infection is rising drastically and different variants of COVID-19 affects all groups of population, including pregnant women. For this reason, it is very important to be ready for the possible anesthesia problems of COVID-19 parturients, because physiological changes in pregnant women may increase the severity of illness when infected with respiratory viruses [7]. There is a limited number of cases describing the influence of COVID-19 on anesthesia management of parturients. Neuroaxial anesthesia is routinely using for parturients and it is not contraindicated for COVID-19 cases [8,9]. Aim of this study is to evaluate neuroaxial anesthesia practice for COVID-19 parturients.

Materials and Methods

This is a retrospective, non-randomized study provided in a single hospital - TSMU First University clinic. According to the

hospital's protocol, in cases when COVID- 19 was not established earlier, after initial positive quick test, all parturients underwent to COVID- 19 testing using polymerase chain reaction (PCR) test for COVID-19 with nasopharyngeal swabs. In majority of cases, diagnosis of COVID-19 established during testing on admission.

Statistical analysis provided using Student's t-test with SPSS program. Continuous data were expressed in mean \pm standard deviation. Test considered statistically significant when the value of $p < 0.05$.

Results

From January to August of previous year 44 COVID-19 parturient underwent to neuroaxial anesthesia. Among them in 23 cases provided spinal anesthesia for cesarean section, in 20 cases - labor epidural and in one case after labor epidural performed cesarean section. Consequently, 24 parturient underwent to cesarean sec-

tion. All patients had minor or no symptoms of COVID-19, no or minor oxygen dependency (nasal cannula oxygenation 3-5 l/min). Due to radiation safety, chest X-ray or CT study was not performed for these patients. The whole team for labor epidural or cesarean section cases equipped with Level-3 personal protective equipment (PPE) (liquid-proof apron, N-95 mask, goggles, visor, and overshoes). Prior to neuroaxial interventions coagulation study had been anticipated. Procedures provided in isolated area for COVID-19 parturients. During labor/cesarean section parturients monitored with standard ASA monitoring system, applied surgical mask for infection prophylaxis and nasal cannula oxygenation 3-5 ml/min. Before performing of spinal anesthesia 500-1000 ml crystalloid solution infused for each parturient. Subarachnoid space identified at L3-4 level with 25 - 27G pencil point needle insertion in sitting position of parturient, after which isotonic 0.5% Bupivacaine 10 - 12.5 mg + 4-8 mg dexamethasone had been injected. Intraoperative hypotension management aimed to maintain mean arterial pressure above 65 mm. Hg. After cesarean section patients monitored in postoperative room until improvement of spinal anesthesia and pain killers given as needed.

Indications for labor epidurals was the request of parturient and obstetrician. Epidural catheter inserted at L2-3 level, catheter directed cranially at 4-5 cm and fixed with adhesive plaster; Test dose: Lidocaine 2% 3.0; Initial dose: ropivacaine 0.2% 10.0. Maintenance: ropivacaine infusion 0.1% 5-8 ml/h adjustment of bolus doses ropivacaine 0.2% 5ml as needed.

Test	Cesarean, spinal (n = 23)	Labor epidural (n = 21)	P value
Leukocytes (10 ⁹ /L)	9.045 ± 2.75	8.23 ± 3.67	0.4
Lymphocytes (%)	14.7 ± 4.9	17.3 ± 8.5	0.2
Thrombocytes (10 ³ /μl)	309 ± 102.58	256.7 ± 71.83	0.07
Fibrinogen (g/L)	4.698 ± 1.17	4.529 ± 0.79	0.6
C - protein (mg/L)	37.67 ± 44.21	18.82 ± 19.67	0.01
D - dimer (μg/L)	2049.42 ± 181.76	1585.5 ± 1137.28	0.36
INR	0.9985 ± 0.1011	1.0144 ± 0.078	0.5926

Table 3: Laboratory findings.

There were no preterm deliveries. All 24 cesarean sections - without major complications; Transient hypotension/bradycardia after 5-10 min of intrathecal bupivacaine injection treated with phenylephrine/atropine boluses and crystalloid infusion. Nausea/vomiting was in 5 cases and improved after correction of hypoten-

sion. No postoperative hypotension occurred. Excessive perioperative bleeding (>1000 ml) and needs in blood transfusion - 3 cases. No coagulation disorders. No need in ICU admission. After improvement of spinal anesthesia all patients admitted to isolated obstetric ward.

Cesarean section	Labor Epidural	P value
30.76 ± 5.66	26.82 ± 3.92	0.3

Table 1: Parturient age.

There were no statistically significant difference according to age of parturient (Table 1). Indication for cesarean section in most cases was previous cesarean. Among other indications were weakness of labor activity, position and condition of fetus, patient request and cesarean after labor epidural due to weakness of labor activity (Table 2).

Indication	Number of case (n = 24)
Weakness of labor activity	5
Previous Cesarean	12
Position and condition of fetus	4
Cesarean section after labor epidural	1
Patient request	2

Table 2: Indications for cesarean section.

For all parturients standard laboratory tests, such as complete blood count (CBC), coagulation status, measurement of C-protein and D-Dimer provided on admission. Statistically significant difference occurred according to C-protein level, which was higher in patients who underwent to the cesarean section. No thrombocytopenia or any other coagulative disorders occurred (Table 3).

During labor epidural we have not seen any complication. Time of labor epidural had been defined according to parturient request and obstetrician decision. No hypotension had been detected after labor epidural, all vital parameters were stable. Adjustment of ropivacaine boluses - according to parturient request. They were able to walk under personnel supervision. Epidural catheter removed at 2h after delivery. Among 23 labor epidurals - 22 cases with physiologic delivery and in one case due to weakness of labor activity cesarean section performed under epidural anesthesia. For epidural cesarean initial dose of 10 ml of 2% lidocaine infused in epidural space with adjustment of 10 ml 0.75% ropivacaine after 15 min. After 2h of delivery epidural catheter removed and patient admitted to isolated obstetric ward.

According to our study, no major complications of mothers and no neonatal complications occurred. There is a tendency to hypercoagulability in this cohort of COVID-19 parturient. No thrombocytopenia and bleeding coagulopathy had been seen. Inflammation marker - C protein increased in both groups of parturient, it was more significant in parturient which underwent to cesarean section. Relative lymphopenia occurred with no significant difference between the groups of parturients.

Discussion

For the treatment of COVID-19 parturients exists at least two main problems: care of infected parturients and protection of medical staff. For minimizing of COVID-19 complications in many countries are increased cases of cesarean section which initially achieved to 93% in China and 64% worldwide [3,4]. Maternal death occurred in 0.1% of cases and ICU admission in 3% of cases [5]. Other characteristics of COVID-19 in parturient is increased rates of early delivery (especially - cesarean), which in non-severe cases is explaining with needs of prevention of possible maternal and neonatal complications [1,6]. Generally, problems to whom can lead COVID-19 in pregnancy are: possible complications to parturient and fetus, time of delivery, decision about cesarean section or physiologic delivery, timing of labor epidural, patient isolation, health care personnel protection, vertical transmission of infection, infection transmission following of neuroaxial procedures, thrombocytopenia, coagulation disorders and complications, related to severity of infection, including critical conditions [9-14]. Therefore, it is not surprising, that obstetricians lowered the C-section threshold during COVID-19 pandemic, aiming to reduce inpatient mater-

nal stays, cross-infection and the use of protective equipment [1]. At the same time, some pregnant women, worried about the unpredictability of labor, are choosing elective C-section for delivery. Despite of this possible problems, according to current literature generally there are rare major complications and in particular neuroaxial procedures are safe for parturient with COVID-19 [1,2]. In our cohort of parturients no one was needed in hospitalization due to severity of COVID-19. Laboratory studies had not been shown any significant pathology, which might make questionable the safety of neuroaxial anesthesia.

Consequently, according to our study, difference from routine obstetric neuroaxial anesthesia practice included only the use of PPE and parturient isolation.

Conclusions

Cesarean section under spinal anesthesia and labor epidural are safe for COVID-19 parturient. For these patients no correction in technique (except PPE for medical personnel and surgical mask for patients and their isolation) and doses of medications are needed. COVID-19 in parturient is not related with increased rates of complications related to neuroaxial anesthesia. Larger prospective and retrospective studies are needed for conclusion.

Statement of the Problem

COVID-19 pandemic presents unique challenges for anesthesiologists, especially those, which are caring for patients during labor and delivery. It is well established, that in case of COVID-19, for the reasons of safety of patients and healthcare personnel, elective surgical and anesthesia procedures must be postponed but it is not possible for parturient. Therefore, the anesthesiologist must solve specific problems relating to pregnancy, childbirth and COVID-19. In the TSMU first university clinic, 44 parturients were COVID-19 positive according to PCR- test and they were treated using institutive COVID-19 protocol. Due to radiation safety, chest X-ray or CT study was not performed for these patients. Prior to neuroaxial interventions coagulation study had been anticipated. For providing of the neuroaxial procedures nasal canula oxygenation under surgical mask had been used for each parturient and health-care personnel equipped with PPE and N-95 mask. For labor analgesia epidural anesthesia was the preferred method. Initially, 0.2% ropivacaine 10.0 was injected with consequent infusion of maintenance dose - 0.1% naropine 5-8 ml/h and bolus doses of 0.2% ropivacaine

added as needed. In case of cesarean section, for quicker analgesia 10 ml 2% epidural lidocaine had been injected with adjustment of 0.75% ropivacaine for analgesia maintenance after 15 minute. For patients without initial epidural catheter placement or epidural catheter malfunction, spinal anesthesia was used for cesarean section with subarachnoid injection of 10-12.5 mg. bupivacaine and 4 mg dexamethasone. Hypotension was treated with phenylephrine bolus injections. In cases of resistant hypoxemia, general anesthesia was used for cesarean delivery. Neuroaxial anesthesia provided without significant complications and was safe for physiologic childbirths and cesarean sections for COVID-19 parturient.

Neuroaxial anesthesia is safe for childbirth analgesia and cesarean for COVID-19 parturient. No other special methods are needed for this reason, except the measures which are defined according to institutive protocol for the prevention of infection spread.

Bibliography

- Nasr S. "Impact of COVID-19 on obstetric anesthesia: a systematic review". *Ain-Shams Journal of Anaesthesiology* 13 (2021): 70.
- Arab W and Atallah D. "Cesarean section rates in the COVID-19 era: False alarms and the safety of the mother and child". *European Journal of Midwifery* 5 (2021): 1-2.
- Vardhelli V, et al. "Perinatal COVID-19: review of current evidence and practical approach towards prevention and management". *European Journal of Pediatrics* 180.4 (2021): 1009-1031.
- Chen L., et al. "Clinical Characteristics of Pregnant Women with Covid-19 in Wuhan, China". *The New England Journal of Medicine* 382.25 (2020): e100.
- "Data on COVID-19 during Pregnancy: Severity of Maternal Illness". Centers for Disease Control and Prevention (2021).
- Dashraath P, et al. "Coronavirus disease 2019 (COVID-19) pandemic and pregnancy". *American Journal of Obstetrics and Gynecology* 222.6 (2020): 521-531.
- Siston AM., et al. "Pandemic 2009 influenza A (H1N1) virus illness among pregnant women in the United States". *JAMA* 303 (2010): 1517-1525.
- Karasu D, et al. "Our anesthesia experiences in COVID-19 positive patients delivering by cesarean section: A retrospective single-center cohort study". *Journal of Obstetrics and Gynaecology Research* 47 (2021): 2659-2665.
- Bauer Melissa E., et al. "Neuraxial Procedures in COVID-19-Positive Parturients: A Review of Current Reports". *Anesthesia and Analgesia* 131.1 (2021): e22-e24.
- Bauer ME., et al. "Obstetric anesthesia during the COVID-19 pandemic". *Anesthesia and Analgesia* 131 (2020): 7-15.
- Mullington CJ., et al. "The timing of labor epidurals in COVID-19 parturients: a balance of risk and benefit". *Anesthesia and Analgesia* 131 (2020): e131-e132.
- Alyamani O., et al. "Considerations and recommendations for obstetric anesthesia care during COVID-19 pandemic - Saudi Anesthesia Society guidelines". *Saudi Journal of Anesthesia* 14 (2020): 359-364.
- Jain K, et al. "Management of pregnant laboring women during COVID-19 pandemic". *Journal of Anaesthesiology Clinical Pharmacology* 36 (2020): S91-S96.
- Magoon R., et al. "Labour analgesia in COVID-19 positive parturients: Points to ponder!". *Trends in Anaesthesia and Critical Care* 38 (2021): 16-17.

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