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## CLINICAL INFORMATION

# Anesthesia for Cesarean Section in a Patient with Guillain-Barre Syndrome: Case Report

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### Abstract

**Background and objectives:** Guillain-Barre syndrome during pregnancy is considered a rare neurological complication, and there is no consensus in literature for anesthetic management for cesarean section in such patients. The objective of this paper is to report the case of a pregnant woman with Guillain-Barre syndrome undergoing cesarean section.

**Case Report:** Female patient, 22-year old, 35 weeks and 5 days of gestation, undergoing cesarean section, hospitalized, reporting decreased strength and lower limb paresthesias. Cerebrospinal fluid (CSF) analysis showed increased protein (304 mg.dL<sup>-1</sup>) without increased cellularity. The anesthetic technique used was general anesthesia induced with propofol (1.5 mg.kg<sup>-1</sup>) and maintained with 2% sevoflurane in oxygen and fentanyl (3 µg.kg<sup>-1</sup>). The procedure was uneventful for both mother and neonate. The patient was discharged 10 days after admission, after progressive improvement of neurological symptoms.

**Conclusion:** The anesthetic technique for pregnant women with Guillain-Barre syndrome requiring cesarean section remains at the discretion of the anesthesiologist, who should be guided by the clinical conditions and comorbidities of each patient.

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## Introduction

Guillain-Barre syndrome (GBS) is an acute inflammatory demyelinating polyneuropathy characterized by progressive loss of strength, areflexia and ascending flaccid paralysis <sup>1-4</sup>.

GBS diagnosis is based on clinical presentation, laboratory tests, and electromyography. The anesthetic management for cesarean section in patients with GBS has no consensus in the literature, a fact that motivated this case report.

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## Case report

Female, white, 22-year old, smoker, obese, with 35 weeks and 5 days gestation, previous history of urinary tract infection, admitted to the hospital complaining of decreased strength in the lower limbs, which caused her fall from height three days before admission.

The patient reported lower limb paresthesias. Neurological examination revealed bilateral areflexia, abolished plantar cutaneous reflex, and loss of strength in both legs. Brain and spinal magnetic resonance imaging was inconclusive. CSF analysis showed a clear, colorless liquid, with glucose level of 69 mg.dL<sup>-1</sup> (45-80 mg.dL<sup>-1</sup>), protein of 304 mg.dL<sup>-1</sup> (15-50 mg.dL<sup>-1</sup>), and absence of changes in biochemistry or related to cellularity. Laboratory tests showed no hematological, biochemical, or coagulation changes. Obstetric examination revealed oligohydramnios, no history of vaginal loss, fetal heart rate unchanged, and prodromal labor.

GBS was diagnosed during neurological investigation and cesarean delivery indicated pregnancy termination. We initiated prophylaxis for thromboembolic events with subcutaneous low molecular weight heparin (40 mg).

The patient was monitored with electrocardiogram (DII and V5), peripheral oxygen saturation (SpO<sub>2</sub>), and noninvasive blood pressure. After venipuncture with an 18G intravenous device, 0.9% saline solution (10 mL.kg<sup>-1</sup> body weight) was infused before induction of anesthesia.

We chose general anesthesia for the procedure. After pre-oxygenation, we administered propofol (1.5 mg.kg<sup>-1</sup>) and fentanyl (3 µg.kg<sup>-1</sup>). Airway management was performed uneventfully with rapid sequence intubation, Sellick's maneuver, and cannula with internal diameter in 7.0 mm.

After removal of the fetus and umbilical cord clamping, sevoflurane 2% was initiated with intravenous supplementation of fentanyl (2 µg.kg<sup>-1</sup>). Intravenous dipyrone (50 mg.kg<sup>-1</sup>), ketoprofen (100 mg) cefazolin (2 g), and oxytocin (15 IU) diluted in 1,000 mL of 0.9% saline solution were also administered. The patient was hemodynamically stable during the procedure and required no vasoactive drugs, resuming spontaneous ventilation, with volume and respiratory rate appropriate at the end of the procedure. Extubation was performed with the patient awake and cooperative, without problems.

The child showed no abnormalities at birth, with Apgar score of 8 at 1 minute and 10 at 5 minutes.

After surgery, the patient was taken to the post-anesthesia recovery room on oxygen via nasal cannula (2 L.min<sup>-1</sup>), with 100% SpO<sub>2</sub> and blood pressure within normal limits. There were no changes regarding preoperative clinical neurological condition.

The patient was admitted to the neurology ward, showing a progressive improvement of GBS symptoms and was discharged after 10 days of hospitalization.

## Discussion

GBS in pregnant population has an incidence similar to that of the general population of 1.7/100,000 per year. However, it is considered a serious event due to the complications that may affect both mother and fetus<sup>5,6</sup>.

Although it is most often preceded by an infectious viral condition, in the case presented here the onset was insidious following an episode of urinary tract bacterial infection adequately treated with antibiotic therapy, differentiating it from epidemiological studies<sup>4</sup>.

The suspected diagnosis in this case was confirmed by CSF analysis, which showed dissociation between protein level and CSF cytology<sup>7</sup>. Electromyography was not performed because the diagnosis had been confirmed by other methods.

Treatment of pregnant or nonpregnant patients with GBS is predominantly symptomatic. In nonpregnant women, plasmapheresis or immunoglobulin therapy accelerates recovery<sup>7</sup>. Although described in the literature, the use of these therapies in pregnant women does not yet provide an adequate level of evidence to be indicated in this case.

The obstetric management of pregnant women with GBS is not different from that of other pregnant women, as uterine dynamics is maintained and vaginal delivery can be uneventfully performed<sup>8</sup>. The indication for pregnancy termination by the obstetric team through cesarean delivery occurred due to the presence of neurological disease.

There has been no consensus in literature over the anesthetic technique for cesarean section in the presence of a GBS episode. Regional anesthesia (epidural or subarachnoid) and general anesthesia are techniques used by various authors.

The choice of the analgesic technique and anesthesia for cesarean section in pregnant women with GBS should be carefully evaluated because both are potentially high risk in this population<sup>1</sup>.

The potential risk of regional anesthesia in patients with neurological diseases should not be underestimated. Steiner et al. reported the occurrence of GBS one to two weeks after epidural anesthesia in two patients undergoing general surgery and on one patient undergoing cesarean section<sup>9</sup>. A causal relationship between the anesthesia performed in these patients and GBS cannot be established, as other reports have shown the development of GBS in patients undergoing surgical procedures under general anesthesia.

Particularly in the pregnant population with GBS, the epidural anesthesia or spinal block for both labor and cesarean section analgesia was uneventful with good tolerability by the patients, as reported by Brooks et al.<sup>8</sup> and MacGrady<sup>10</sup>.

However, patients with GBS have greater sensitivity to local anesthetics, which may cause a spread of sympathetic block greater than expected, with unexpected hemodynamic effects (hypotension, bradycardia, and cardiovascular system collapse)<sup>11</sup>. Brooks et al. suggest the cautious administration of local anesthetic through an epidural catheter to establish the desired level of blockade for cesarean section in patients with GBS and the use of direct-acting sympathomimetic agents to correct hypotension, as the indirect-acting drug response is unpredictable in these cases<sup>8</sup>.

The most prevalent non-anesthetic complication in pregnant women with GBS is pulmonary thromboembolism, which leads to high maternal mortality. Prophylaxis with low molecular weight heparin is an emergency procedure and was appropriately adopted in this case<sup>5,6</sup>.

We chose general anesthesia based on the patient's clinical condition and use of low molecular weight heparin, as the worsening of neurological symptoms during the perioperative period would hinder further evaluation if there were any complications related to regional anesthesia.

The patient presented physiological changes related to pregnancy, including difficult airway management<sup>12</sup>. Even taking precautionary measures relating to fasting, induction of anesthesia was performed considering the patient on a full stomach. In the clinical assessment, the patient airway had no predictive factors of difficult airway.

Airway was managed uneventfully with Sellick's maneuver. Although very controversial, avoiding neuromuscular blocking drugs during intubation was taken into account regarding GBS.

The depolarizing neuromuscular blocker succinylcholine would be the drug of choice for rapid sequence airway management, but the possibility of hyperkalemia with consequent cardiac arrest due to flaccid muscle paralysis in this patient was a contraindication<sup>13</sup>.

The use of non-depolarizing neuromuscular blocking agents in patients with GBS presents risk of prolonged blockade, requiring ventilatory support postoperatively. There is no basis in the literature for the use of sugammadex in patients with GBS<sup>14</sup>.

The use of inhaled anesthetics has no clinical consequences associated with GBS pathophysiology. However, its administration must take into account the possible autonomic changes that may accompany this disease in order to avoid hemodynamic effects in these patients<sup>13</sup>.

Opioid analgesics have no interference in GBS pathophysiology as well, but its use should be determined by the clinical condition of the mother and repercussions on the fetus.

In conclusion, the anesthetic technique to be used in pregnant patients with Guillain-Barre syndrome requiring cesarean section remains at the discretion of the anesthesiologist, who must be guided by the clinical condition and comorbidities of each patient.

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