

Emergency Cesarean Delivery in a Guillain- Barre Syndrome Patient

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Abstract

Guillain-Barré syndrome is an acute inflammatory demyelinating polyradiculopathy characterized by progressive motor weakness, areflexia, and ascending paralysis. Guillain-Barré syndrome is extremely rare in pregnant patients, and there are no established guidelines for delivery or safest anesthetic methods. We report an emergency Cesarean delivery in the case of a 25-year old woman who was diagnosed as Guillain-Barré syndrome at her 26 weeks gestation. Tracheostomy was performed as prolonged ventilatory support was required in the intensive care unit. The respiratory difficulty was exacerbated by the growth of the fetus, necessitating emergency Cesarean delivery. The delivery was successfully performed under general anesthesia, and the patient recovered without neurological sequelae.

Keywords: Cesarean section, General anesthesia, Guillain-Barré syndrome, Pregnancy, Tracheostomy

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Introduction

The incidence of Guillain-Barré syndrome has been reported as 0.75 to 2 cases per 100,000 persons per year. Patients with Guillain-Barré syndrome usually have a history of upper respiratory tract infection or gastroenteritis 1 to 3 weeks prior to the onset of the disease¹. Guillain-Barré syndrome starts with weakness of the extremities and can progress to weakness in the trunk, cervical area, facial muscles, and even respiratory muscles, causing respiratory failure in severe cases. Patients may also present with sensory symptoms, including cranial nerve deficits and autonomic nervous system dysfunction.

Guillain-Barré syndrome during pregnancy is very rare. We report a case of cesarean delivery under general anesthesia in a 25-year-old woman who was diagnosed as Guillain-Barré syndrome at her 26 weeks gestation, and who eventually required ventilation via a tracheostomy.

Case report

A 25-year-old, 155 cm, 68kg, gravida 2, para 1, pregnant woman received cesarean delivery due to

failure of labor progression at 33 weeks and 6 days of pregnancy. The patient was a known case of hypothyroidism and was receiving thyroxin. She had a history of fever, back pain and weakness of lower limbs during 24th week of pregnancy and she was admitted at local hospital. At that time her USG show-single viable foetus, with cephalic presentation of 23+ wks pregnancy with good physical activities, her serum T4-161.6ng/ml, TSH-.78uIU/ml, R.B.S-4mmol/l, Hb-9gm/l, TWBC-11,800/cm³ of blood, serum Ca⁺⁺-8.6mg/dl, serum electrolyte- within normal range. From there patient shifted to another hospital and was diagnosed as Guillain-Barré syndrome and she developed quadriplegia associated with mild respiratory insufficiency, maintaining SPO₂-97% with O₂ 3 L/min through nasal canula, conscious oriented, afebrile, adequate intake- output and haemodynamically stable. Patient then shifted to Dhaka Medical College Hospital. She was intubated after admission and received mechanical ventilator care. Her nutrition was maintained by NG feeding. Eventually tracheostomy was done as ventilatory

Table I: *Haemodynamic condition during surgery*

Time	2.00 pm	2.15 pm	2.30 pm	2.45 pm	2.50 pm	3.05 pm
B.P(mm of Hg)	110/70	100/70	100/60	110/60	110/70	110/70
H.R(/min)	118	130	120	98	96	98

support was prolonged. Then plasma pheresis was done for 48 session in 8 days.

At 34 weeks of gestation we observed that active labour started with rupture of membrane and presence of show. Then emergency cesarean section was decided rather than instrumental vaginal delivery to be performed as foetal heart rate started to drop. Preoperative evaluation was within normal limits, except sinus tachycardia (120 beats per minute) on electrocardiogram. Without premedication the patient was transferred from ICU to the operating room with manual ventilation via tracheostomy. Standard monitoring, pulse-oxymetry and noninvasive blood pressure measurement were started.

On arrival at the operating room, the blood pressure was 110/80 mmHg, heart rate was 110 beat per minute, SpO₂ 98% under gentle manual assisted ventilation with 100% oxygen. General anaesthesia was planned. She was induced with I.V. 100 mg of ketamine and 0.6mg atropine, no muscle relaxant was used and manual assisted ventilation via tracheostomy was continued with oxygen 2.5L/min, N₂O3L/min and Halothane 0.5% . The baby (Male, 2.5kg, Apgar score 8) was delivered at 15 minutes from the starting time of surgery and the placenta was extracted 3 minutes later. Oxytocin 10 unit was administered intravenously slowly and 20 unit was mixed with 1000ml Hartman's solution and Propofol infusion at the rate of 30mcg/kg/min was started. Intra operative period patient was hemodynamically stable . No muscle relaxant was administered during surgery and obstetrician was satisfied to do surgery and the delivered baby was healthy. Patient was sent to ICU with assisted manual ventilation. The motor score upon ICU arrival was 3 to 4 in all extremity, similar to that of preoperative values. Total operation time was 55 minutes and duration of anaesthesia was 75 minutes. Total infused crystalloid, estimated blood loss, and urine output were 300 ml, 250 ml and 100 ml respectively and patient was haemodynamically stable (Table-I).

In ICU, ABG was done (P^H-7.36,Pco₂-30 mm of Hg,Po₂-294 mm of Hg,HCO₃-22.5,BE -3.1)and ventilation setup was on SIMV with PSV(tidal volume 450 ml, PSV 15 cm of H₂O,breath 10/min, FiO₂ 0.4) and continue ECG monitoring, and thyroid function test was done (S.T₄-150ng/ml, S.TSH-.74ng/ml.)

Weaning from mechanical ventilation was started on 10th postoperative day (POD) and successfully done on 20th POD. One month later, she was discharged and had been on outpatient department follow-up.

Discussion

Pregnant Guillain-Barré patients have a higher risk for neurological deficits, a respiratory failure rate of 35%, and a maternal mortality rate of 10 to 35%^{2,3}. There is no clear evidence that termination of pregnancy can improve the outcome or facilitate the recovery of the mother, and previous studies have shown that uterine contraction is preserved and normal vaginal delivery is possible in these patients^{4,5}. Thus, Guillain-Barré syndrome itself is not an indication for pregnancy termination or for cesarean delivery. Nevertheless, owing to a lack of previous studies, no guidelines for delivery and anaesthetic techniques have been established^{2,3}. The appropriate mode of delivery and anaesthetic management of the parturient with Guillain-Barré syndrome depend on the patient's clinical condition at the time of delivery.

In the present case, an obstetrician judged that rupture of membrane ocured so induction of delivery or emergency cesarean delivery was essential. Louis et al. reviewed the medical records of 30 pregnant Guillain-Barré patients (from 1986 to 2002) and found that preterm deliveries occurred in eight cases (34.7%): three had spontaneous labor, and five were iatrogenic premature deliveries due to deterioration of the maternal neurological condition or preeclampsia⁴. In our case, the patient had rupture of membrane and the fetal heart rate had decreased, making premature delivery inevitable.

In patients with Guillain-Barré syndrome, both regional and general anesthesia may be performed. It has been reported that there is no superior mode of anaesthesia, as administration of both regional and general anaesthesia have each been associated with potential risks⁴. For general anaesthesia in Guillain-Barré syndrome patients, succinylcholine should be avoided because of its risk of hyperkalemia¹. Feldman reported that a parturient with Guillain-Barré syndrome had a cardiac arrest due to hyperkalemia that occurred shortly after succinylcholine administration for general anaesthesia⁶. Non-depolarizing muscle relaxants should be administered with caution, because they may result in prolonged neuromuscular block and postoperative mechanical or assisted ventilation⁷. The TOF count should be monitored from the beginning of induction of anaesthesia to prevent overdosing of muscle relaxant. In this case no muscle relaxant was used but surgeon was completely satisfied as adequate muscle relaxation was there.

There are controversies in regional anesthesia with Guillain-Barré syndrome patients. Steiner et al.⁸ reported Guillain-Barré syndrome occurring one to two weeks after epidural anaesthesia in three patients who had general surgery or delivery, mentioning that epidural anaesthesia may have triggered Guillain-Barré syndrome. Wiertlewski et al.⁹ reported a Guillain-Barré syndrome case, with worsening of symptoms after delivery via epidural anaesthesia. The patient did not fully recover from the motor block after epidural anaesthesia, and neurological symptoms worsened immediately after delivery. However, it would be unreasonable to generalize that regional anaesthesia causes Guillain-Barré syndrome or that it makes Guillain-Barré syndrome worsen, solely based on several previous reports. Neurologic symptoms after the surgery can be affected by many patient-related, surgery-related and anaesthesia related risk factors¹⁰. In addition, there is no clear evidence that epidural anesthesia causes Guillain-Barré syndrome yet. Several cases have been reported that epidural anaesthesia was successfully performed during cesarean delivery of Guillain-Barré syndrome patients, in which all patients are fully recovered after the anaesthesia^{7,11,12}. Furthermore Hebl et al. reviewed the medical chart of 139 patients with a history of

CNS disorder who received neuraxial anaesthesia or analgesia from 1988 to 2000, and found no case of new or worsening neurologic symptoms. It was therefore concluded that adverse events after regional anaesthesia to patients with CNS disorders are not as frequent as once thought and regional anaesthesia should not be considered an absolute contraindication in these patients¹⁰.

Autonomic nervous system instability is another important consideration for Guillain-Barré syndrome patients in pregnancy. Because Guillain-Barré syndrome patients may present with autonomic nervous system instability¹³, it is more appropriate to use directly acting adrenergic agents rather than indirectly acting sympathomimetic agents due to unpredictability of the effect⁷.

The incidence of pulmonary embolism in non-pregnant Guillain-Barré syndrome patients has been reported to be between 1 to 13%¹⁴. Therefore prophylactic anticoagulation treatment is considered as a standard management in immobilized Guillain-Barré syndrome patients¹⁵. Gaber et al.¹⁵ reported that the incidence of deep vein thrombosis was 7% and pulmonary thromboembolism was 4% despite of prophylactic anticoagulation in Guillain-Barré syndrome patients (including non-pregnant Guillain-Barré syndrome patients). Furthermore as pregnancy itself a strong risk factor for thromboembolism, early prophylactic anticoagulation should be applied and other supportive care, including physiotherapy, compressive stockings and early ambulation after delivery, is highly recommended⁴.

Conclusion

In this case, cesarean delivery was successfully performed under general anaesthesia without neurological exacerbation. Hence patients should be managed aggressively with monitoring and fluid electrolyte resuscitation. Minimum doses of anaesthetic agents and drugs are recommended since myocardial depression.

Although there is no established guideline for delivery and anaesthetic technique yet, Guillain-Barré patients with pregnancy should be evaluated individually and carefully anaesthetized according to medical judgment by the anaesthesiologist.

In this case- Ketamine acts as preemptive analgesic and avoid systemic depression as patient

was hypothyroid. Propofol was used to obtund the effect of ketamine , to avoid drug cummulation and to prevent further use of Ketamine.

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