Case Report

Anesthetic management of a parturient with Guillain–Barre syndrome posted for emergency caesarian section

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ABSTRACT

We report the anesthetic management of a case of Guillain–Barre syndrome in the 34th week of gestation coming for an emergency Cesarean section. The perioperative anesthetic challenges have been discussed with emphasis on the medical and anesthetic management which includes the use of plasma-pheresis, intravenous gamma–globulin, and the safety of preservative free 0.75% isobaric ropivacaine, which was administered intrathecally in this difficult medical condition with excellent hemodynamic, maternal, and fetal outcome. The sensory and motor blocks achieved were well suited to the clinical risks and conditions.

Key words: *Emergency caesarian section, Guillain–Barre syndrome, intrathecal isobaric 0.75% ropivacaine, pregnancy*

INTRODUCTION

Guillain–Barre syndrome (GBS) is one of the leading causes of non-trauma-induced paralysis in the world. The annual incidence of GBS have been documented to be 0.75–2% per 100,000[1]; however, its incidence has been estimated to be 6–24 cases/100,000 of the population during pregnancy.[2] It is an uncommon neurological disorder associated with demyelinization of the peripheral nerves, more often seen in the first 2 weeks of puerperium[3] rather than during pregnancy.

GBS is usually triggered by an acute infectious process and typically begins with fine distal paraesthesia followed by leg weakness which later progresses proximally and is accompanied commonly by pain in the large muscles of the leg and back.

Treatment mainly comprises of symptomatic care which includes thrombo-embolic prophylaxis, adequate nutrition, and physiotherapy.[4] Apart from the conservative management, plasmapheresis and gamma-globulins are used in GBS to modify the disease progression.[5] One third of pregnant patients with GBS may require assisted ventilation in the intensive care unit.[6]

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CASE REPORT

A 26-year-old lady, weighing 64 kg, height 158 cm, 2nd gravida, and in her 3rd trimester of pregnancy (34 weeks) was admitted in the intensive care unit with history of acute onset, progressively increasing weakness of all her four limbs, since the past 5 days. She was bed ridden since the past 4 days prior to admission.

Her previous medical history was unremarkable. She was not in acute respiratory distress and neurological examination revealed normal higher motor function without any evidence of facial or bulbar weakness. Motor power was found to be 3/5 in both upper limbs with a grip power of approximately 30%, and 2/5 in both lower limbs. No sensory loss could be detected. Deep tendon reflex were depressed in all the four limbs. Autonomic nervous system instability was not detected. Her uterine size and obstetric history corresponded and ultrasonography showed a 34 wks ± 2 wks single active fetus with no anomalies.

The investigations which were carried out included full blood count, blood biochemistry, blood glucose (fasting and postprandial), coagulation profile, ECG, CSF study, and antibody titer for cytomegalovirus. The latter was negative

and CSF examination revealed proteins 144 mg/dl, glucose 75 mg/ dl and no cells. Nerve conduction velocity study revealed severe polyneuropathy of all four limbs, predominantly of the axonal type.

Following admission the patient was treated with I.V. Immunoglobulin, 400 mg/kg for 3 consecutive days along with physiotherapy and other supportive therapy like proper maintenance of nutrition and thromboprophylaxis. Great care was taken to prevent any aortocaval compression and fetal monitoring was carried out by the attending obstetrician.

However, on the sixth day of admission she had premature rupture of the membrane (PROM) and the obstetrician decided to go for an emergency lower uterine caesarean section (LUCS). The pre-anesthesia examination revealed heart rate of 94/min, ECG showing sinus rhythm, blood pressure 110/70 mmHg, respiratory rate of 22/min regular, chest was clear on auscultation with bilateral vesicular breath sounds, arterial saturation on room air was 99%, temperature was 98 degree Fahrenheit, pallor, jaundice and edema were absent and the JVP was not raised.

Anesthetic management

Decision was taken to carry out the LUCS under spinal anesthesia. The patient was preloaded with 15 ml/kg of lactated Ringers solution over 15 min to prevent any drop of blood pressures following the subarachnoid block. This procedure was performed after anesthetizing the skin in midline with 2% Lidocaine over the L3-4 spinal interspace and then using a 25 gauge Whitacre needle, which was inserted at the same space with the patient lying in the left lateral position, to prevent aortocaval compression, and keeping in mind the premature rupture of the amniotic membrane with continuous leakage of liquor.

Preservative-free isobaric 3 ml (22.5 mg) of 0.75% Ropivacaine (Ropin Inj 0.75% Neon Laboratories Limited) was injected intrathecally @ 0.1 ml/sec. After the injection of the spinal medication, the patient was turned supine with left uterine displacement using a wedge. Maternal heart rate, arterial O_2 saturation, respiratory rate, and noninvasive arterial blood pressure were monitored continuously. Blood pressures were noted every 2 min till the delivery of the baby, 3 min post-delivery up to the end of surgery and 5 min thereafter for the next 3 h. Intraoperative hemodynamics were stable except for the occurrence of tachycardia to maximum of 124/min which gradually settled down to 92 /min over the next 60 min. The blood pressure remained within 20% of baseline value and any fall was managed by fluid bolus of Ringer lactate solution. The onset of sensory block to T10 took about 4.5 min and it reached to maximum T6 level while motor block was achieved to Bromage scale 2. There was no requirement to administer any vasopressors to treat fall in blood pressure in the intraoperative period. The procedure was uneventful and a single healthy male baby weighing 2.75 kg was delivered with ABGAR score of 9/9/10. The motor regression (Bromage 4) was noted at 98 min and the sensory regression to T10 at 130 min after the administration of the subarachnoid block.

DISCUSSION

GBS in pregnancy is a rare occurrence.[2] Its exact etiology is not established but it may represent an aberrant immune response. Approximately two third of patients have a history of antecedent acute infectious illness, especially Cytomegalovirus.[7] There is evidence of mycobacterium jejuni as an antecedent infection in approximately 26% of disease cases.[8] In the review of the literature by Nelson and Maclean, fetal survival was greater than 96%;[9] however, there has been one reported case of a newborn infant born to a mother with GBS who also had clinical features of the syndrome.[10] The mortality from GBS is 3–8% owing to sepsis, pulmonary embolism, adult respiratory distress syndrome, or unexplained cardiac arrest. Of the remainder, 5–10% will have some permanent residual disabling neurological deficit. A further 65% will have some persistent minor problem. Only around 15% of these patients recover completely.[1]

GBS has no effect on uterine contraction or cervical dilatation and therefore these patients should be allowed to deliver vaginally.[4] However, as the ability to bear down will be weakened, vacuum extraction may be required to shorten the second stage of labor. Otherwise unnecessary obstetric intervention should be discouraged.[11] Our patients required Caesarean section for obstetric reason.

GBS has to be differentiated from the conditions with similar clinical presentation, such as polyneuritis secondary to vitamin B_{12} deficiency, abnormal porphyrin metabolism, heavy metal intoxication, and toxic neuritis, secondary to agents like nitrofurantoin or insecticides.[7]

Diagnostic criteria of GBS[1] are (a) relatively symmetrical weakness of two or more limbs due to neuropathy, (b) areflexia, (c) disorder course less than 4 weeks, (d) exclusion of other causes like absence of fever, (e) typical CSF finding on lumbar puncture, (f) and electrophysiological evidence of demyelination from electromyogram.

In our case the CSF examination revealed proteins 144 mg/ dl, glucose 75 mg/dl, and no cells and the nerve conduction velocity study revealed severe polyneuropathy of all four limbs, predominantly of the axonal type.

The management of GBS in pregnancy is similar to that of the non-pregnant population. It mainly comprises of symptomatic care, deep venous thrombosis prophylaxis, adequate nutrition, and physiotherapy. The forced vital capacity (FVC), heart rate, respiratory rate, blood pressure, fluid, and electrolyte balance should be closely monitored along with the assessment of the ability to cough and protect the airway.

If the FVC is found to be less than 1.5 l or if the patient is at risk of aspiration, she should be readily shifted to an intensive therapy unit.[4]

High dose of intravenous immunoglobulin (IVIg) at 400 mg/ kg for 5 days and plasmapheresis can be administered.[12] The use of plasmapheresis in GBS definitely has clinical benefit.[5] Plasmapheresis is generally used if the patient presents within 7 days from time of onset of symptoms or require respiratory support.[13] In pregnancy, plasmapheresis should be reserved only for very severe cases, and it has no effect on fetal development.[7] Treatment with IVIg is an alternative, which has been used successfully in both pregnant and non-pregnant patients.[4] As our patient did not require any respiratory support, she was treated with IVIg only and she responded well to this treatment.

Various anesthetic techniques can be adopted, depending upon the type of surgical intervention needed. Whenever general anesthesia is contemplated in GBS, one should avoid succinyl choline due to the risk of hyperkalemia due to proliferation of post-synaptic receptors which may even lead to cardiac arrest.[14] Non-depolarizing muscle relaxants are also recommended, but we need to use it cautiously as these patients may be sensitive to this group of relaxants, and post-operative ventilation may be required in some cases due to prolonged effect of the drug. Patients with GBS are sensitive to local anesthetics too and may have profound hypotension and bradycardia along with cardiovascular collapse[15] primarily because GBS causes autonomic nervous system instability.[1] Practitioners who have used epidural anesthesia successfully have reported that these patients require only small doses of local anesthetic drugs, compared to a normal healthy parturient.[16] Epidural analgesia for pain relief in labor is useful in these patients as it prevents autonomic instability[17] due to pain.

We preferred spinal anesthesia as the procedure of choice in our case as it was a surgical emergency and our patient had relatively stable preoperative hemodynamics. While choosing the subarachnoid block, we carefully documented the residual weakness of both the upper and lower limbs and were also concerned about the respiratory reserve if the block ascended cranially. Ropivacaine was our drug of choice due to its better cardiac safety profile, less neurotoxicity, shorter duration of action and lesser motor block as compared to Bupivacaine.[18]

Hyperbaric solutions spread under the influence of gravity, and patient position is accepted as the main determinant of the subarachnoid spread. The extent or spread of plain/isobaric spinal anesthetic solutions is considered to be unpredictable and is not or less position dependent.[19] Attempts to explain the unpredictability of extent of spinal block by isobaric Ropivacaine has led to many dose finding studies. In a particular study, various doses of isobaric ropivacaine has been used along with Fentanyl for cesarean sections to achieve the level of block up to L1.[20] Studies have shown that the level of block up to T7 could be achieved by intrathecal administration 2 ml of isobaric ropivacaine at L2-L3 spinal interspace.[21] In our case, we chose to administer 3 ml of 0.75% (22.5 mg) of Isobaric Ropivacaine intrathecally at L3-L4 spinal interspace and achieved the level of block up to T6. This dose provided satisfactory surgical anesthesia for the entire duration of surgery which lasted for an hour, without causing major hemodynamic alterations.

CONCLUSION

Guillain–Barre syndrome in pregnancy is a challenge for both the obstetrician and the anesthesiologist, more so when faced with a premature rupture of the amniotic membrane coming for an emergency LUCS. Careful monitoring of the ongoing hemodynamics, neurological and respiratory signs and symptoms are vital to decide on the choice of one's anesthetic technique. A dose of 3 ml (22.5 mg) preservative-free isobaric 0.75% Ropivacaine administered intrathecally at L3-4 spinal interspace proved to be a good and safe technique to perform anesthesia for an emergency LUCS without causing inadvertent higher levels of sympathetic blockade, adverse variation of hemodynamic status and respiratory compromise in such a rare case.

REFERENCES

1. Ropper AH. The Guillian Barre Syndrome. N Engl J Med 1992;326:1130- 6.
2. Batashki I, Markova D, Milchev N, Uchikova E, Dimitrova E. A case of Guillian Barre Syndrome in pueroerium. Akush Ginekol (Sofiia) 2007;46:48-50.
3. Cheng Q, Jiang GX, Fredrikson S, Link H, de Pedro-Cuesta J. Increased incidence of Guillain- Barré Syndrome postpartum. Epidemiology 1998;9:601-4.
4. Rockel A, Wissel J, Rolfs A. GBS in pregnancy - An indication for Caesarian section? J Perinat Med 1994;22:393-8.
5. Hughes RAC. Plasma exchange for Guillain Barreâ syndrome. Br Med J 1985;291:615-6.
6. Lapinsky SE, Kruczynski K, Slutsky AS. Critical care in the pregnant patient. Am J Respir Crit Care Med 1995;152:427-55.
7. Hurley TJ, Brunson AD, Archer RL, Lefler SF, Quirk JG. Landry Guillian Barre Syndrome in pregnancy. Report of three cases treated with plasmaphersis. Obstet Gynecol 1991;78:482-5.
8. Kuwabara S, Ogawara K, Misawa S, Koga M, Mori M, Hiraga A, *et al*. Does campylobacter jejuni infection elicit demyelinating Guillian Barre Syndrome? Neurology 2004;63:529-33.

9. Nelson LH, Maclean WT. Management of Landry GBS in pregnancy. Obstet Gynaecol 1985;65:25s-9s.
10. Luijckx GJ, Vles J, de Baets M, Buchwald B, Troost J. GBS in mother and newborn child. Lancet 1997;349:27.
11. Quinlan DJ, Moodley J, Lalloo BC, Nathoo UG. Guillain BarreÂ Syndrome in pregnancy. A case report. S Afr Med J 1988;73:611-4.
12. Meythala RG, Miller JT, Stevens JC, Hughes RA, Wijdicks EF, Barohn R, *et al*. Practice parameter: Immunotherapy for Guillian Barre Syndrome: Quality standards subcommittee of the American Academy of Neurology. Neurology 2003;61:736-40.
13. Gautier PE, Hantson P, Vekemans MC, Fievez P, Lecart C, Sindic C, *et al*. Intensive care management of Guillian Barre Syndrome during pregnancy. Intensive Care Med 1990;16:460-2.
14. Feldman JM. Cardiac arrest after succinylcholine administration in a pregnant patient recovered from Guillian Barre Syndrome. Anesthesiology 1990;72:942-4.
15. Perel A, Reches A, Davidson JT. Anaesthesia in Guillian Barre Syndrome. Anaesthesia 1977;32:257-60.
16. McGrady EM. Management of labour and delivery in a patient with Guillain Barreâ Syndrome. Anaesthesia 1987;42:899-900.
17. Brooks H, Christian AS, May AE. Pregnancy, anaesthesia and Guillain Barreâ syndrome- case report. Anaesthesia 2000;55:894-8.
18. Mather LE, Copeland SE, Ladd LA. Acute toxicity of local anesthetics: Underlying pharmacokinetic and pharmacodynamic concepts. Reg Anesth Pain Med 2005;30:553-66.
19. Greene N. Distribution of local anaesthetic solutions within the subarachnoid space. Anesth Analg 1985;64:715-30.
20. Kim HK, LeeSG, Ban JS, Min BW. Comparison of three dose of isobaric Ropivacaine mixed with Fentanyl during Spinal Anaesthesia for Caesarian section. Korean J Anesthesiol 2002;43:606-10.
21. Khaw KS, Ngan Kee WD, Wong EL, Liu JY, Chung R. Spinal Ropivacaine for caesarian section- a dose finding study. Anesthesiology 2001;95:1346-50.

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