



Anaesthetic management of patient with parkinsonism for emergency laparotomy using enteral levodopa postoperatively

Dr Madhu¹, Dr Binny Sachdeva², Dr Vivek Singh Kataria², Dr Diksha Gulia², Dr Asha¹

¹Senior Resident, Department of Anesthesiology, PGIMS Rohtak, Haryana, India

²Postgraduate student, Department of Anesthesiology, PGIMS Rohtak, Haryana, India

Abstract

Parkinsonism is a neurological disorder that poses unique challenges in the perioperative period. This case report presents the successful anaesthetic management of 60 year old female patient with parkinsonism who underwent emergency laparotomy for peptic perforation. It highlights the importance of careful preoperative assessment, medication management, anaesthesia selection, intraoperative monitoring and postoperative care to ensure optimal outcome in such patients.

Keywords: Parkinson disease, levodopa, laparotomy

Corresponding Author: Dr Binny Sachdeva, Postgraduate student, Department of Anesthesiology, PGIMS Rohtak, Haryana, India

Introduction

Parkinson disease is a neurodegenerative disease caused by loss of dopaminergic fibres from the basal ganglia.¹ The anaesthetic problem in Parkinson disease includes antiparkinsonism drug interaction with anaesthetic drugs and pathophysiological alteration in respiratory, cardiovascular, autonomic and neurological system.²

Case Report

A 60 year old female weighing 50 kg with complaints of pain abdomen, abdominal distension and vomiting for 2 days presented to surgical emergency department. On per abdomen examination the patient was having guarding and rigidity. Patient was also a known case of Parkinson disease for 3 years for which the patient was taking tab levodopa 100mg, tab carbidopa 25 mg, tab amantidine 100mg twice a day, tab safinamide 100 mg once a day and tab sertraline 50 mg once a day. The patient has taken the morning dose of antiparkinsonism drugs. There was no history of hypertension, diabetes mellitus, seizure, bronchial asthma, ischaemic heart disease, drug abuse and psychiatric illness. There was no history of memory impairment. She was having normal power in upper and lower limbs. She was having tremor at rest. Patient gives history of hysterectomy 15 years back under spinal anaesthesia and history of blood transfusion during the same surgery. On general examination patient was conscious, oriented, afebrile with pulse rate of 125/min, blood pressure of 120/76mmHg and oxygen saturation of 96% on room air. On airway examination patient was having adequate mouth opening and modified MPG of grade III. Flexion and extension movement of the neck were normal. On chest auscultation fine crepitations were present on bilateral side. The

patient hematological and biochemical investigations were within normal limits. ABG analysis shows pH-7.483, pCO₂-25mmHg, pO₂-80mmHg, hematocrit-40%, sodium-127.6mmol/L, potassium-3.6mmol/L, Lactate-1.7mmol/L, SO₂-95.6%, BE-4.8mmol/L and HCO₃ of 18.9mmol/L. X-ray chest or abdomen shows gas under the diaphragm. After taking the informed and written high risk consent for surgery and anaesthesia in view of known case of parkinsonism and related perioperative complications. Patient was shifted to operation theatre. Baseline vital parameters were- heart rate which was regular and was ranging from 120-130, blood pressure of 124/78mmHg and oxygen saturation of 96% on room air. Intravenous access was secured in right hand with 18G cannula and inj glycopyrrolate 0.2 mg was given. Plasmalyte was used as maintenance fluid. Ryle's tube suction was done prior to induction of anaesthesia to decrease the risk of aspiration. Rapid sequence induction was done with fentanyl-80mcg, propofol-100mg and succinylcholine-75mg and intubated with oral ETT of 7.5 mm internal diameter. The anaesthesia was maintained with oxygen-40%+air-60%+isoflurane-0.8% and inj atracurium-25+5mg. For intraoperative analgesia paracetamol and ketorolac was given. The surgery lasted for 2 hours. Intraoperatively Ryle's tube was pushed in duodenum distal to the site of perforation. The urine output was 200 ml and blood loss was around 400ml. The patient was hemodynamically stable throughout the procedure. Before completion of surgery local infiltration of incision site was done with 20mL of 0.25% plain bupivacaine. After the completion of surgery all inhalational anaesthetic agents were stopped. Spontaneous breathing efforts were seen. Reversal of neuromuscular blockade was done with inj neostigmine 2.5 mg + inj glycopyrrolate 0.4mg intravenously. At the time of extubation severe muscle rigidity was seen with decreased tidal volume generation progressively. Decision to shift the patient to ICU was taken for further management and observation with ETT in situ. After shifting to ICU all vital monitors were attached. Through nasogastric tube tab levodopa 100mg+tab carbidopa 25 mg was given with 10 ml of saline flush. After 50-55 minutes adequate breathing efforts were seen. Eye opening, head raise, deglutition reflex were present. The patient was following all verbal commands. ETT cuff was deflated after orotracheal and ryle's tube suctioning. Endotracheal tube was removed. After 1 day of observation patient was shifted to ward and was discharged after 5 days.

Discussion

The anaesthetic management of Parkinson disease is challenging due to respiratory, cardiovascular and neuropsychiatric involvement.² Parkinsonism is the clinical syndrome comprising of hypokinesia, rigidity and tremor due to destruction of dopamine containing nerve cell in substantia nigra of basal ganglia.³ There are various manifestations pertaining to this disease like autonomic dysfunction which can cause orthostatic hypotension, sialorrhea, constipation, incontinence and altered response to vasopressors.⁴ There can also be respiratory dysfunction which can results from rigidity and muscle weakness. There is also risk of perioperative aspiration pneumonia due to pharyngeal muscle weakness which leads to secretion retention. Postoperative emergence reaction associated with tremor and rigidity can occur at the time of extubation.^{5,6}

Levodopa can cause hypotensive effect.⁷ Antiemetics like metoclorpramide which have dopamine antagonistic activity should be avoided. The timing of doses of Parkinson's medication is very important as abrupt withdrawal can cause worsening of symptoms. The

therapeutic administration of levodopa should be continued on the morning of surgery. Levodopa and carbidopa has absorption through small bowel. Enteral levodopa has advantage over intravenous levodopa because levodopa titration for intravenous administration may be dangerous due to interaction with anaesthetic agents and increases the risk of arrhythmia and hypertension.^{8,9}

For premedication anticholinergic glycopyrrolate bromide is preferred as it doesn't cross blood brain barrier. Thiopentone decreases dopamine release from striatal synaptosomes and propofol have facilitatory effect on GABAergic transmission and inhibitory effect on glutamate transmission which is responsible for antiparkinsonian effect, so propofol should be used.^{10,11} Patient with parkinsonism are predisposed to narcotic side effect like rigidity.¹² NSAIDS can be used for analgesic management. There is increased incidence of postoperative bronchospasm because patient Parkinson disease have obstruction dysfunction due to parasympathetic overactivity which makes them susceptible to muscarinic effect of neostigmine.

Conclusion

Careful consideration of anaesthesia selection, medication management, intraoperative monitoring and postoperative care are essential to ensure safety and well being of the patient with parkinsonism undergoing surgery. Regional anaesthesia is technique of choice wherever possible as it reduces the drug interaction. Perioperatively prevention of acute exacerbation with Parkinson disease can be done by timing the levodopa administration nasogastric tube tip placed in the proximal small bowel in peptic perforation.

References

1. Nicholson G, Pereira AC, Hall GM. Parkinson's disease and anaesthesia. *Br J Anaesth* 2002;89:904-16.
2. Brennan KA, Genever RW. Managing Parkinson's disease during surgery. *BMJ* 2010;341:c5718.
3. DeLong MR, Juncos JL. Parkinson's Disease and Other Movement Disorders. In: Kasper DL, Fauci AS, Longo DL, Braunwald E, Hauser SL, Jameson JL, editors. *Harrison's Principles of Internal Medicine*. 17th ed. New York: McGraw-Hill Medical Publishers; 2008. pp. 2406–17.
4. Nicholson G, Pereira AC, Hall GM. Parkinson's disease and anaesthesia. *Br J Anaesth*. 2002;89:904–16.
5. Roizen MF, Fleisher LA. Anesthetic implications of concurrent diseases. In: Miller RD, editor. *Miller's Anaesthesia*. 7th ed. New York: Churchill-Livingstone; 2010. pp. 1167–50.
6. Stoelting RK, Dierdorf SF. Disease of the Nervous System. In: Stoelting RK, Dierdorf SF, editors. *Anesthesia and Co-Existing Disease*. 4th ed. Philadelphia: Churchill Livingstone; 2002. pp. 233–98.
7. Robert K. Stoelting, Simon C. Hillier. Drugs used for treatment of Parkinson's Disease. In: Robert KS, Simon CH, editors. *Pharmacology and Physiology in Anaesthetic Practice*. 4th ed. Philadelphia: Lippincott Williams and Wilkins; 2006. pp. 580–4.

8. Robert K. Stoelting, Simon C. Hillier. Drugs used for treatment of Parkinson's Disease. In: Robert KS, Simon CH, editors. *Pharmacology and Physiology in Anaesthetic Practice*. 4th ed. Philadelphia: Lippincott Williams and Wilkins; 2006. pp. 580–4.
9. Goyal N, Wajifdar H, Jain A. Anaesthetic management of a case of Parkinson's disease for emergency laparotomy using enteral levo-dopa intraoperatively. *Indian J Anaesth*. 2007;51:427–8.
10. Muravchick S, Smith DS. Parkinsonian symptoms during emergence from general anaesthesia. *Anesthesiology*. 1995;82:305–7.
11. Yamakura T, Sakimura K, Shimoji K, Mishina M. Effects of propofol on various AMPA-, kainate- and NMDA-selective receptor channels expressed in *Xenopus* oocytes. *Neurosci Lett*. 1995;188:187–90.
12. Mason LJ, Cojocaru TT, Cole D J. Surgical intervention and anaesthetic management of the patient with Parkinson's disease. *Int Anesthesiol Clin*. 1996;34:133–50.