

# Parkinson's disease: Anesthetic considerations

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## Abstract

Parkinson's disease is a relatively common neurological disorder. Few case reports are available regarding optimal management of patients with Parkinson's. Here we present the successful anaesthetic management of a case of Parkinson's for emergency laparotomy. Enteral route of levo-dopa administration was used during anaesthesia.

## INTRODUCTION

Parkinson's disease is a relatively common neurological disorder. Many drugs have been developed which increases the supply of dopamine, affect the biochemical balance of dopamine, or act as a dopamine substitute. These drugs may have significant interactions with anesthetic agents.<sup>1</sup> In addition, there are several disease and drug-induced physiological aberrancies that can have profound anesthetic implications in the patient with Parkinson's disease (e.g., aspiration pneumonitis, myocardial irritability, hypotension, hypertension, and respiratory impairment).

Drugs used in anaesthesia may interact with anti-parkinsonian medication and there is controversy about the optimal anaesthetic management of patients with Parkinson's disease.

Here we present a case of Parkinson's successfully managed with enteral levo-dopa<sub>2</sub> for emergency laparotomy.

## CASE REPORT

A 74 yr old man with Parkinson's disease was scheduled for emergency laparotomy for suspected ileal perforation. He had been suffering from Parkinson's disease for 10 yr and was well controlled with oral administration of Tab. carbidopa/levodopa (10/100)(syndopa 110), a levodopa preparation in tablet form, four times daily; Tab. Trihexyphenyldyl 2 mg thrice daily and Tab. Entacapone 200 mg thrice daily. The patient was given his usual medications 1.0 h before the operation. On arrival to the operation room anesthesia was induced with 100 mg propofol and 6 mg vecuronium to facilitate tracheal intubation. Anesthesia was maintained with O<sub>2</sub> + N<sub>2</sub>O + isoflurane + vecuronium. Epidural catheter was placed at T<sub>10</sub>

level as incision extended from xiphisternum to pubic symphysis. Epidural bolus of 8ml of 0.125% bupivacaine and infusion was started with 0.125% bupivacaine and 2microgm/ml fentanyl @ 8 ml/hr. One tablet of syndopa 110 was dissolved with 10 ml of saline, and the solution was given into the stomach through the nasogastric tube every 2 h during the operation

Immediately after surgery, he emerged from anesthesia smoothly and exhibited no muscle rigidity. After the surgery administration of levodopa through Ryles tube was continued every 2<sup>nd</sup> hourly. His postoperative course was uneventful.

## ETHICS

This case was done after taking informed consent at Lady Hardinge Medical College, New Delhi. The patient was explained the enteral administration of levo-dopa through Ryles tube that will follow the surgery.

## DISCUSSION

The neurodegenerative death of dopaminergic neurons of the pars compacta of the substantia nigra leads to the classical triad of resting tremor, muscle rigidity, and bradykinesia of Parkinson's disease.<sup>3,4</sup> The syndrome of parkinsonism (clinical conditions which resemble idiopathic Parkinson's disease) may have a number of different causes such as arteriosclerosis, diffuse central nervous system degenerative disease, repeated head trauma, tumour, metabolic defects such as Wilson's disease, heavy metal, or carbon monoxide poisoning. Drug-induced parkinsonism results from dopamine receptor block by drugs such as phenothiazines, butyrophenones, and metoclopramide.

Particular anaesthetic problems are neurological, respiratory, and cardiovascular. The clinical features and the interaction of common anaesthetics with the drug therapy of the patient present an anaesthetic challenge and directly influence perioperative morbidity and mortality.

L-DOPA can only be administered enterally and its half-life is short (1–3 h). It is absorbed from the proximal small bowel and, therefore, cannot be given as a suppository.<sup>5</sup> Ensure that patients do not miss medication doses postoperatively. Regional anaesthesia has obvious advantages over general anaesthesia as it avoids the effects of general anaesthetics and neuromuscular blocking drugs, which may mask tremor. If general anaesthesia is required, it is worth noting that L-DOPA can be administered intraoperatively via a nasogastric tube.<sup>6</sup> Few case reports have described parkinsonian episodes in patients receiving thiopental.<sup>7,8</sup> The clinical significance of this is unclear and thiopental has not been directly implicated in exacerbating parkinsonian symptoms. Ketamine is theoretically contraindicated in Parkinson's disease because of an exaggerated sympathetic response. Propofol is an ideal agent to use because of its rapid metabolism and emergence profile. Neuromuscular blocking agents can be used safely however Succinylcholine has been reported to cause hyperkalaemia in a patient with Parkinson's disease.<sup>9</sup> There are numerous reports of muscle rigidity following the use of fentanyl in normal patients, and those with an established diagnosis of Parkinson's disease.<sup>10</sup> We used epidural fentanyl in our patient safely without any problem in the presence of enteral levo-dopa through Ryle's tube every 2<sup>nd</sup> hourly and use of muscle relaxants which reverses the opioid induced muscle rigidity.<sup>11</sup> Low dose isoflurane is also safe as it does not sensitize the myocardium to the action of catecholamines.<sup>5</sup>

## **FUTURE DIRECTIONS**

The successful management of our case match few other case reports.<sup>6</sup> Enteral levodopa has a clear advantage over intravenous levodopa and should be preferred. Treatment with and drug titration of LD for intravenous administration alone may be dangerous during general anesthesia because of interactions with anesthetic agents. It may increase the risk of a variety of arrhythmias or hypertension as reported previously. These side effects of LD are mediated through its metabolite, dopamine.<sup>12</sup>

## **CONCLUSION**

In conclusion, we report the perioperative treatment of a

patient with Parkinsons by using administration of Levodopa through a nasogastric tube during propofol anesthesia intraoperatively and in the early postoperative period. The perioperative management described in this report is practical, easy and prevented the exacerbation of Parkinsonian symptoms during the postoperative period. Though this patient underwent ileal surgery, absorption of levo dopa from stomach and duodenum was able to prevent any exacerbation of symptoms during intraoperative and postoperative period.

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