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Case Report

Anesthesia Management in a Low Weight Patient with Parkinson's Disease: A Case Report

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Abstract

Background: Parkinson's disease (PD) is a progressive neurological disease related to the destruction of dopaminergic neurons in the substantia nigra, basket spot and other brain regions, which is mainly characterized by motor neurological disorders and non-motor neurological disorders. Middle-aged and elderly people are more common, with more women than men. Polypharmacy in PD patients may lead to potential interactions with anesthetic drugs, so perioperative management is very important. *Case presentetion*: An 80-year-old female with a medical history of PD weighing 28kg, planed to undergo elective peritoneoscopically assisted transvaginal uterine abdominal wall suspension under general anesthesia. Antiparkinsonian medications continued until just before the induction of anesthesia. Preoperative examinations were completed and they showed no obvious abnormality. Vital signs, train-of-four (TOF) and bispectral index (BIS) were monitored to guide the administration of anesthesia. Appropriate sedatives, analgesics, muscle relaxants and antiemetics were selected after fully assessed the patient's condition and drug interactions during the perioperative period. The patient successfully completed the surgery and discharged from hospital. *Conclusions*: General anesthesia (GA) is the main anesthesia method for patients with Parkinson's disease undergoing surgery. When patients with PD undergo surgery, the anesthesiologists should fully and carefully evaluate the patient's status and preoperative combination of medications. Perioperative drugs that aggravate Parkinson's disease should be avoided in order to facilitate a smooth recovery after surgery.

Keywords

Parkinson's Disease (PD), Low Weight, Anesthesia Management

1. Introduction

Parkinson's disease is a progressive neurodegenerative condition, which is associated with the deposition of aggregated α-synuclein [1]. It is mainly characterized by motor neurological disorders and non-motor neurological disorders, such as bradykinesia, resting tremor, myotonia, postural gait abnormalities and mood, cognition, sleep, mental, olfactory, and autonomic disorders functional abnormalities [2-4]. The three clinical manifestations of PD patients are: dyskinesia, tremor and rigidity. Middle-aged and elderly people are more common (the incidence of patients over 60 years old is about 1%, and the incidence of patients over 85 years old is about 4%) [5], with more women than men [6]. When patients with PD receive surgical treatment, the mortality rate and the rate of major complications are significantly increased [7], so perioperative management is very important. Polypharmacy in older PD patients may lead to potential interactions with

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anesthetic drugs. We presented the evaluation and management of perioperative anesthesia in an elderly low weight patient with PD who would undergo surgery for uterine prolapse.

2. Case Presentation

An 80-year-old female with a medical history of PD, highing 153cm and weighing 28kg. An elective peritoneoscopically assisted transvaginal uterine abdominal wall suspension was planned to treat the uterine prolapse. There was no past surgical history and other complications. Two home medications included pramipexole dihydrochloride 0.125mg four times a day, levodopa and benserazide hydrochloride one tablet (the contents were 200mg and 50 mg respectively) four times a day. In the past four years, autonomous activities have been significantly limited. Antiparkinsonian medications continued until just before the induction of anesthesia.

Preoperative examinations, including vital signs, blood samples, 12-lead electrocardiogram (ECG), and chest computed tomography (CT), were completed. Because the patient was automotor and unable to fully cooperate, the ECG report showed sinus rhythm and image interference. Other tests showed no obvious abnormality.

Vital signs were monitored before anesthesia induction. 100% oxygen was inhaled by mask to discharge nitrogen, train-of-four (TOF) and bispectral index (BIS) were given. Intravenous injection of sufentanil, etomidate and rocuronium fully sedated. Before tracheal intubation, 2% lidocaine was sprayed into the throat and subglottis for full surface anesthesia. Left radial artery puncture was performed to place a catheter for invasive arterial monitoring and blood gas analysis. Mechanical ventilation (volume controlled with FiO2 50%) was performed after induction of general anesthesia. Anesthesia was maintained with sevoflurane and remifentanil. The operation lasted about 50 minutes. Sugammadex sodium was given to antagonize rocuronium bromide and the intubation was removed when the patient was fully conscious. Four days after the operation, the patient was discharged from the hospital successfully.

3. Discussion

General anesthesia (GA) is the main anesthesia method for patients with Parkinson's disease undergoing surgery. Patients with PD are at higher risk of peri-operative medical and surgical complications [8]. Regional anesthesia (RA) has the advantages of not affecting the patient's condition, monitoring the symptoms of PD during the operation, and recovering oral anti-Parkinson drugs earlier after the operation, which is suitable for some Parkinson's patients [9]. However, the disadvantages of RA in PD patients must also be considered. PD tremor not only interferes with monitoring equipment, but may also make surgery impossible. In addition, patients with PD are often accompanied by dysphagia, which increases the risk of aspiration during surgery. Airway protection measures such as tracheal intubation should be implemented more aggressively [10]. Considering that the patient planned to undergo laparoscopic surgery, we preferred general anesthesia. Due to the particularity of PD patients, the use of general anesthesia should be fully considered.

Although there is a risk of PD associated with long-term exposure to inhaled anesthetics, there is insufficient evidence that the use of inhaled anesthetics during surgery worsens PD [11]. In patients with PD who have taken levodopa for a long time, the use of halothane anesthesia should be avoided because it can increase the sensitivity of the heart to catecholamines [12].

Propofol and midazolam are the most commonly used intravenous anesthesia drugs in clinical practice. Propofol has potential anti-Parkinson's disease effect and is widely used in anesthesia of patients with PD [13]. However, it is still necessary to pay attention to the extrapyramidal symptoms caused by propofol, such as tremor, athetosis, and dystonia [14]. For some patients, low doses of propofol can achieve the desired level of loss of consciousness [15].

Remifentanil can inhibit the stimulation of tracheal intubation and skin resection in patients with PD, but the dosage should be appropriately reduced [16]. Fentanyl may cause bradykinesia and rigidity in patients with PD, but does not affect its combined use with propofol.

In this case, the patient was low in body weight and relatively weak. Etomidate was used during induction to reduce the drastic fluctuations in circulation, and rocuronium bromide was used as a muscle relaxant. The operation lasted for a short time, and the tracheal catheter was successfully pulled out after the operation with the antagonism of sugammadex sodium. However, it should be noted that etomidate may cause muscle tremors, and pre-administered sufentanil and lidocaine can reduce the occurrence of such adverse reactions.

Non-steroidal anti-inflammatory drugs can reduce the amount of opioid analgesics, which will not aggravate PD. Some non-steroidal anti-inflammatory drugs in the treatment of PD has been proved effective [17]. However, it is important to note that some patients with PD also have pain, and they take analgesics on a daily basis. So it is necessary to avoid the accumulation of analgesics.

For postoperative antiemetic drugs, antiemetic drugs with dopamine-antagonistic effects such as metoclopramide and promethazine should be avoided as they may aggravate the condition in patients with PD [18].

4. Conclusions

In conclusion, when patients with Parkinson's disease undergo surgery, the anesthesiologists should fully and carefully evaluate the patient's status and preoperative combination of medications. Perioperative drugs that aggravate Parkinson's

disease should be avoided in order to facilitate a smooth recovery after surgery.

Abbreviations

PD	Parkinson's Disease
ECG	12-Lead Electrocardiogram
CT	Chest Computed Tomography
TOF	Train-of-Four
BIS	Bispectral Index
GA	General Anesthesia
RA	Regional Anesthesia

Author Contributions

Hong Tu is the sole author. The author read and approved the final manuscript.

Conflicts of Interest

There have no conflict of interest.

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