



REVISTA BRASILEIRA DE ANESTESIOLOGIA

Publicação Oficial da Sociedade Brasileira de Anestesiologia
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CLINICAL INFORMATION

Anesthetic management of a patient with multiple sclerosis – case report



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Received 20 February 2014; accepted 19 March 2014
Available online 25 April 2016

KEYWORDS

Multiple sclerosis;
Urologic surgery;
Propofol;
Sevoflurane;
Remifentanil

Abstract

Background and objectives: Multiple sclerosis is a demyelinating disease of the brain and spinal cord, characterized by muscle weakness, cognitive dysfunction, memory loss, and personality disorders. Factors that promote disease exacerbation are stress, physical trauma, infection, surgery, and hyperthermia. The objective is to describe the anesthetic management of a case referred to urological surgery.

Case report: A female patient, 44 years of age, with multiple sclerosis, diagnosed with nephrolithiasis, referred for endoscopic ureterolithotripsy. Balanced general anesthesia was chosen, with midazolam, propofol and remifentanil target-controlled infusion; sevoflurane via laryngeal mask airway; and spontaneous ventilation. Because the patient had respiratory difficulty presenting with chest wall rigidity, it was decided to discontinue the infusion of remifentanil. There was no other complication or exacerbation of disease postoperatively.

Conclusion: The use of neuromuscular blockers (depolarizing and non-depolarizing) is a problem in these patients. As there was no need for muscle relaxation in this case, muscle relaxants were omitted. We conclude that the combination of propofol and sevoflurane was satisfactory, not resulting in hemodynamic instability or disease exacerbation.

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PALAVRAS-CHAVE

Esclerose múltipla;
Cirurgia urológica;
Propofol;
Sevoflurano;
Remifentanil

Controle anestésico de paciente com esclerose múltipla – relato de caso**Resumo**

Justificativa e objetivos: Esclerose múltipla é doença desmielinizante do cérebro e da medula espinhal, caracterizada por fraqueza muscular, disfunção cognitiva, perda da memória, alterações de personalidade. Fatores que promovem exacerbação da doença são estresse, trauma físico, infecções, cirurgias, hipertermia. O objetivo é descrever a abordagem anestésica de um caso encaminhado a cirurgia urológica.

Relato de caso: Paciente do sexo feminino, 44 anos, portadora de esclerose múltipla, com o diagnóstico de nefrolitíase, é encaminhada a ureterolitotripsia endoscópica. Optou-se por anestesia geral balanceada com midazolam, propofol e remifentanil em infusão alvo-controlada, sevoflurano sob máscara laríngea e ventilação espontânea. Tendo apresentado dificuldade ventilatória por tórax rígido, optou-se por interromper a infusão de remifentanil. Não se registraram outras intercorrências nem exacerbação da doença no pós-operatório.

Conclusão: O uso de bloqueadores neuromusculares (tanto despolarizantes como não-despolarizantes) constitui um problema nestes pacientes. Como não havia necessidade de relaxamento muscular neste caso, eles foram omitidos. Concluímos que a associação de propofol e sevoflurano foi satisfatória, não resultando em instabilidade hemodinâmica nem exacerbação da doença.

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Introduction

Multiple sclerosis (MS) is a demyelinating disease of the brain and spinal cord (peripheral nerves are not affected), with remissions and chronic relapses or progressive course. It is possibly caused by the interaction between genetic and environmental factors, whose exact etiology is unknown. It is characterized by loss of muscle strength, initially reversible; cognitive dysfunction; memory loss; personality changes; and emotional lability.¹⁻⁵ Symptoms appear between the ages of 20 and 40, with prevalence 8 times higher in females⁴; nevertheless, in the case of male patients, the exacerbation is potentially more serious, with lower survival rate.⁶ Associated conditions include convulsions and uveitis. Muscle breakdown causes hyperkalemia and the possibility of neuromuscular blocking agent overdose. Chronic treatment with corticosteroids predisposes to adrenal suppression and gastric ulceration.⁴

The clinically established factors for disease exacerbation include stress crises and physical trauma, infections, surgery, hyperthermia, puerperal period.^{2,5,7} Study aimed at verifying whether occupational exposure to inhaled anesthetic agents could increase the risk of MS occurrence in professionals found no relationship between this factor and the development of disease.⁸

The treatment has been directed to controlling the signs and symptoms and disease progression. Corticosteroids are the treatment base, thanks to its immunomodulatory and anti-inflammatory action. Interferon beta is the agent of choice for patients with relapsing-remitting, or glatiramer acetate as an alternative. The immunosuppressant azathioprine is effective in reducing the frequency of relapses, but not during a disease remission.⁵

Case report

Female patient, 44 years old, with severe colic abdominal pain in the right flank with irradiation to the ventral region. Evaluated by the urology team, the patient was diagnosed with nephrolithiasis and indicated for endoscopic ureterolithotripsy. The patient reported having MS, whose symptoms had began ten years ago associated with loss of balance; paresthesia in the right leg; diplopia; and labial commissure deviation. About two years ago, with the diagnosis established, she began to be followed by a neurologist. At that time, she was taking natalizumab, gabapentin 300 mg day⁻¹, and baclofen 10 mg twice daily. The last crisis happened more than a year ago. The patient denied other comorbidities, regular use of other medications, and history of allergies. She was submitted to three previous cesarean sections 25, 22 and 19 years ago, and received spinal anesthesia in the first two and epidural block in the third procedure. Currently, she cannot walk due to severe muscle weakness in both legs.

The patient was admitted to the operating room in a wheelchair, lucid and oriented, with hemodynamic stability, spontaneous ventilation and adequate period of preoperative fasting. After peripheral vein catheterization in the right upper limb and routine monitoring (pulse oximetry, cardioscopy, noninvasive blood pressure, capnometry), general anesthesia was induced using the balanced technique: midazolam 0.02 mg kg⁻¹, followed by remifentanil in target-controlled infusion (3 ng mL⁻¹), propofol in target-controlled infusion (3 ng mL⁻¹), and sevoflurane 1.0 MAC under laryngeal mask. The patient presented with respiratory difficulty, by chest-wall rigidity, readily treated by mechanical ventilation, opting for interrupting the infusion of remifentanil. She underwent surgery in the lithotomy position, and the

procedure lasted 60 min. There were no complications intraoperatively, and at the end of surgery, she was taken to the post-anesthetic care unit, awoken and with stable and asymptomatic vital conditions. There was no exacerbation of MS postoperatively.

Discussion

Anesthetic and perioperative stress are factors that can trigger exacerbation crisis of MS; therefore, individuals with MS subjected to a surgical-anesthetic procedure are at increased risk of neurological dysfunction compared with individuals without MS.¹

Case reports and retrospective studies are limited in determining the effects of anesthetic techniques and perioperative management of patients with MS. The available data do not support the hypothesis that anesthesia may be associated with new demyelinating lesions in patients with MS.²

Neuraxial blockade in patients with MS is controversial due to the potential neurotoxicity of local anesthetics, particularly in demyelinated nerves.^{2,4} However, several retrospective studies do not report significant increase in exacerbations when local anesthetics are administered in the epidural or subarachnoid space.^{2,6,9} But, in case of a precise indication for performing neuraxial blockade, some authors have the opinion that the epidural technique should be preferred.^{4,10}

Perioperative hyperthermia may be a cause of recurrence and postoperative exacerbation of MS because it alters nerve conduction in demyelinated regions.^{4,6} In our case, we perform volume replacement with cold solutions, as well as cooling the patient.

Intravenous induction agents or inhalation anesthetics do not appear to have adverse effects on nerve conduction and the available literature does not associate them with progression of MS.² In most case reports, sevoflurane was used for anesthetic maintenance without reference to postoperative exacerbations of the disease.^{11,12}

The use of neuromuscular blockers is a problem: succinylcholine should be avoided due the occurrence of hyperkalemia; non-depolarizing agents should be avoided, especially in cases of large muscular destruction, and when necessary, it should be used under strict monitoring.⁶ Because the procedure did not require muscle relaxation, and airway management occurred without tracheal intubation, we did not use neuromuscular blockers. Pharmacologic treatment of spasticity includes the use of baclofen and tizanidine systemically, botulinum toxin, alcohol, and phenol locally, with the first two considered first-line treatment.^{8,13} The use of baclofen to control muscle spasms, as was the case with this patient, is appropriate although it can decrease muscle mass.⁶ Venous thrombosis is a risk factor in patients with exacerbated MS after spinal puncture or using high doses of corticosteroids, and prophylactic treatment is indicated.¹⁰ It was not the case with our patient. The disease has periods of exacerbation and remissions at unpredictable intervals, and when only pregnant women are considered, more than half of relapses occur in the postpartum period, usually within the first 3 months.^{9,14} This risk is not related to the type of anesthetic technique or parity.¹⁴ Some case reports have shown good

results with subarachnoid block for cesarean section with no signs of MS exacerbation, even in patients followed for up to 12 months after the procedure.^{9,15,16} Others attest that the well performed epidural block is associated with minimal risk of postpartum exacerbation.^{10,17} There is no consensus on the best technique for pregnant women with MS.

Despite the low level of evidence, there are some studies that support the preoperative use of anxiolytic to control emotional disturbances that can trigger exacerbations, as well as the adequate control of postoperative pain.⁶

Conclusion

Regional or neuraxial anesthesia does not have absolute contraindication for patients with MS, but lower concentrations of local anesthetics and care in handling them are particularly important. These patients have a higher risk for autonomic dysfunction, and they should be strictly followed. Those with the disease at a more advanced stage are at increased risk for perioperative depression, hypoventilation, atelectasis, and sleep apnea. The use of depolarizing neuromuscular blockers should be avoided and non-depolarizing agents should be used under monitoring.

Conflicts of interest

The authors declare no conflicts of interest.

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