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CLINICAL INFORMATION

Kinsbourne Syndrome: Case Report

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Abstract

Background and objectives: Kinsbourne syndrome is a rare neurological disorder that primarily affects children previously healthy and aged between 6 and 36 months. It is characterized by opsoclonus (rapid, irregular, horizontal and vertical eye movements) and myoclonus that may affect trunk, limbs or face, and cerebellar ataxia. It may be considered a paraneoplastic syndrome by association with neuroblastomas, hepatoblastomas and, rarely, ganglioneuromas. The aim of this paper was to present the most relevant aspects of Kinsbourne syndrome, as well as the technique used for resection of mediastinal tumor in a child with this syndrome.

Case report: Child, 1 year and 5 months, with a diagnosis of posterior mediastinal tumor and Kinsbourne syndrome. Premedicated with oral midazolam. Anesthesia induced with sevoflurane, nitrous oxide, fentanyl, and rocuronium. Maintenance of anesthesia with sevoflurane, nitrous oxide, fentanyl, and rocuronium. Neuromuscular block reversal with neostigmine combined with atropine. Postoperative analgesia with the use of dipyron, morphine, and ketoprofen. Taken to the intensive care unit extubated, with stable hemodynamic and respiratory parameters. ICU discharge four days after surgery and hospital discharged on the seventh postoperative day without complications. Anatomopathological examination revealed ganglioneuroblastoma.

Conclusions: Kinsbourne syndrome is a rare neurological disorder. The drugs used in our patient proved safe and allowed an uneventful anesthesia. Drugs that trigger or aggravate opsoclonus and myoclonus, such as ketamine and etomidate, should be avoided in these patients.

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Introduction

Kinsbourne syndrome, known as opsoclonus-myoclonus-ataxia, described in 1962 by Marcel Kinsbourne, is a rare neurological disorder that primarily affects previously healthy children, aged between 6 and 36 months, and is

characterized by the presence of opsoclonus (rapid, irregular, horizontal and vertical eye movements) and myoclonus that may affect trunk, limbs or face, and cerebellar ataxia. It may be considered a paraneoplastic syndrome by association with neuroblastomas, hepatoblastomas and, rarely, ganglioneuromas ¹⁻³.

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The objective of this case report was to present the anesthetic management of a child with Kinsbourne syndrome who underwent resection of posterior mediastinal tumor.

Case report

Female patient, 1 year and 5 months old, admitted at the Oncology Center of the Hospital Universitário Oswaldo Cruz, in Recife, with a clinical picture of opsoclonus, myoclonus, ataxia, and irritability, diagnosed with Kinsbourne syndrome. Due to the association with neuroblastoma, an investigation was performed for the diagnosis of neoplasia. The total body scintigraphy with MIBG-I-131 showed a large area of focal hyperuptake of radioactive agent, located in the posterior mediastinum and suggestive of neuroectodermal lineage malignancy (neuroblastoma). Chest computed tomography (CT) showed the presence of a solid and heterogeneous mass occupying the right paravertebral region at the level of the thoracic segments T3-T6, measuring approximately 3.5 x 1.3 cm in its largest diameter, with heterogeneous impregnation by means of intravenous contrast. Resection of a posterior mediastinal tumor was scheduled through a right posterolateral thoracotomy.

In the pre-anesthetic evaluation, the child presented with a clinical picture of opsoclonus, myoclonus of face, trunk and extremities, and irritability, which, according to her mother, had started about a month. The mother reported the occurrence of frequent falls, a daughter of singleton pregnancy from healthy parents. The child was delivered by cesarean section. The mother denied other diseases, drug allergies or previous hospitalizations; she was taking clonazepam, cephalexin, and prednisone. The mother also reported agitation with the use of midazolam, diazepam, and chloral hydrate; general anesthesia to undergo CT without complications. Upon physical examination, the child weighed 12.5 kg, was in good general condition, afebrile, hydrated, and without cyanosis. Pulmonary auscultation revealed coarse breath sounds without adventitious sounds, respiratory rate of 28 rpm. Cardiac auscultation revealed a regular heart rhythm in two stages, normal sounds without murmurs, heart rate of 120 bpm, and blood pressure of 90 x 40 mm Hg. The abdomen was flat, depressible, and without visceromegalies. Additional examinations were as follows: unchanged electrocardiogram, chest X-rays, blood count and coagulation. She was classified as ASA II. Premedication was midazolam 0.8 mg.kg⁻¹. There was induction of anesthesia with sevoflurane and nitrous oxide, as well as monitoring with ECG, pulse oximetry, and noninvasive blood pressure. A peripheral vein in the left arm with 22G teflon catheter was secured. We performed a tracheal intubation with an uncuffed tube (4.5 mm) after the use of fentanyl (5 µg.kg⁻¹) and rocuronium (0.9 mg.kg⁻¹). We monitored using capnography and urinary catheter. We controlled ventilation with a tidal volume of 8 mL.kg⁻¹ and respiratory rate of 14 rpm in CO₂ rebreathing system. Right external jugular vein dissection was performed and catheter inserted. Sevoflurane, nitrous oxide, and additional doses of fentanyl and rocuronium were used for maintenance of anesthesia. Before the surgical incision, hydrocortisone 30 mg was administered. The posterior mediastinal tumor resection, measuring approximately 3 x 3 x 4 cm, was made in the paravertebral region at the level of the azygos vein, uneventfully. We did not use blood products. After tumor

removal, we used dipyrone 30 mg.kg⁻¹, ketoprofen 2 mg.kg⁻¹, and morphine 0.1 mg.kg⁻¹ for postoperative analgesia. During the surgical anesthetic procedure, there were no clinically significant changes in monitored parameters (heart rate and rhythm, blood pressure, oxygen saturation, and ETCO₂). At the end of surgery, we performed reversal of neuromuscular block with atropine sulfate (0.02 mg.kg⁻¹) and neostigmine (0.04 mg.kg⁻¹). The patient was taken to the ICU extubated, calm, 96% SatO₂ in room air with hemodynamic stability. The patient progressed satisfactorily, was discharged from the ICU four days after the surgery and, on the seventh postoperative day, left the hospital showing slight improvement of opsoclonus and myoclonus. Anatomopathological examination of the resected tumor revealed paraspinal ganglioneuroblastoma.

Discussion

Kinsbourne syndrome is characterized by the presence of opsoclonus, myoclonus, and ataxia. Besides these classic findings, irritability, headache, malaise, visual difficulty, dysphasia, mutism, strabismus, vomiting, drooling, lethargy, and sleep disturbances are also present. Although often associated with neuroblastomas, ganglioneuromas and, rarely, hepatoblastomas, the condition may be preceded by different viral infections, such as Epstein-Barr, St. Louis encephalitis, Coxsackie B3, vaccine (immunization), and aseptic meningitis¹⁻⁵. *Mycoplasma pneumoniae* infection has also been associated with this syndrome. Kinsbourne syndrome occurs in 2-3% of neuroblastoma cases, with remission of symptoms after neoplasm removal^{1,3,6}. Typically, the tumor is small, localized, and well differentiated, with good prognosis. Metastasis to the lymph nodes located in the tumor region is frequent, although distant metastases are rare². Neurological involvement, such as motor, cognitive, learning and speech may occur in the long-run²⁻³. Investigation of neuroblastoma can be made through TC, MRI, measurement of urinary catecholamines (adrenal neuroblastoma) and scintigraphy with iodine-131 metaiodobenzylguanidine, the latter being of high sensitivity and specificity, which allows the detection of neoplastic lesions not visualized by other imaging methods¹. Treatment with immunosuppressants is commonly used in patients with Kinsbourne syndrome regardless of etiology, and aims to reduce the formation of antibodies possibly involved in the pathophysiology^{1,3}. Corticosteroids, ACTH, and immunoglobulins are used to reduce lymphocytic and phagocytic responses and production of interleukins^{1,3}. Rituximab, a monoclonal anti-CD20; cyclophosphamide; cyclosporine A; azathioprine; and, in refractory cases, plasmapheresis have been used to treat this syndrome^{1-2,4,7}.

Anesthesia in patients with Kinsbourne syndrome has rarely been reported in the literature. Burrows⁸ induced balanced general anesthesia in a 1-year old patient with Kinsbourne syndrome who underwent laparotomy to remove a kidney tumor with spinal invasion (biopsy showed neuroblastoma islands surrounded by stroma of ganglioneuroma with neurofibromatous changes). The anesthetic technique consisted of morphine, pancuronium, and nitrous oxide. Anesthesia and surgery were uneventful, showing that the use of opioids, nondepolarizing muscle relaxants, and inhalational anesthetics seem safe in these patients. Eight days after surgery, a myelogram was scheduled to evaluate a possible involvement of the spinal cord. The patient

continued to present persistent opsoclonus, myoclonus, and ataxia. The anesthetic technique consisted of intramuscular atropine (0.1 mg) and ketamine (50 mg). About three minutes after ketamine administration, worsening of myoclonus and opsoclonus occurred. Prior to the procedure, we punctured in the peripheral vein and administered an additional dose of ketamine (10 mg) showing no clinical improvement. Then, administering intravenous thiopental (10 mg) showed immediate disappearance of myoclonus, allowing the procedure to continue. It is important to emphasize that when a neuroblastoma is located in the adrenal, catecholamine is released, potentiating the sympathomimetic effect of ketamine⁵. Therefore, ketamine in patients with Kinsbourne syndrome should be avoided because it worsens the clinical picture of myoclonus and opsoclonus. Similarly, drugs that may induce or aggravate myoclonus, such as etomidate, should be avoided in these patients.

In our patient, the use of premedication with midazolam calmed the patient prior to arriving at the operating room and allowed a smooth inhalational induction. Although the mother reported agitation after midazolam, diazepam and chloral hydrate, this effect is associated with age and not with the pathology. The paradoxical agitation seen in children after the use of sedatives is common, particularly with low doses. The use of inhalational anesthetics (sevoflurane and nitrous oxide), opioids (morphine and fentanyl), nondepolarizing neuromuscular blockers (rocuronium), analgesics and NSAIDs (ketoprofen and dipyron), anticholinergics (atropine) and anticholinesterase (neostigmine) allowed induction,

maintenance, and reversal from anesthesia uneventfully, proving to be safe in patients with Kinsbourne syndrome. Drugs that have the potential to trigger or aggravate myoclonic movements and opsoclonus - such as ketamine and etomidate - should be avoided.

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