

ภาวะวิกฤตคาร์ซินอยด์ระหว่างการดมยาสลบ

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บทคัดย่อ

เนื้องอกของต่อมไร้ท่อสามารถแพร่กระจายและหลั่งสารออกฤทธิ์ทางชีวภาพ ได้แก่ เซโรโทนิน ฮีสตามีน และคินินเปปไทด์ ผู้ป่วยที่มีเนื้องอกชนิดนี้มักไม่พบอาการแสดง และพบได้ไม่บ่อย ไม่สามารถคาดการณ์ความรุนแรงของภาวะแทรกซ้อนระหว่างการผ่าตัดได้ ดังนั้นจึงเป็นเรื่องท้าทายในการป้องกันวิกฤตคาร์ซินอยด์ ในช่วงระยะเวลาระหว่างการผ่าตัด

กรณีศึกษา

เป็นผู้ป่วยเพศหญิงวัย 75 ปี ที่ได้รับการวินิจฉัยว่าเป็นโรคความดันโลหิตสูงและโรคเบาหวานชนิดที่ 2 เข้ารับการรักษาที่โรงพยาบาลเกาะสมุยเมื่อสองเดือนก่อน เนื่องจากภาวะหัวใจห้องบนเต้นเร็วผิดปกติและเกิดลิ้มเลือดในหลอดเลือดดำส่วนลึก ผู้ป่วยได้รับการทำเอกซเรย์คอมพิวเตอร์ เพื่อหาสาเหตุของการเกิดลิ้มเลือดในหลอดเลือดดำส่วนลึก แต่พบก้อนเนื้องอกในช่องท้องขนาด 2.5 เซนติเมตรโดยบังเอิญ 2.5 ซม. ผู้ป่วยได้รับการผ่าตัดและเกิดอาการไม่พึงประสงค์ วิกฤตคาร์ซินอยด์ในระหว่างการผ่าตัด

บทอภิปราย

วิกฤตคาร์ซินอยด์อาจก่อให้เกิดความไม่แน่นอนทางโลหิตวิทยาระหว่างการผ่าตัดที่เป็นอันตรายถึงชีวิต โดยส่วนใหญ่เกิดขึ้นกับเนื้องอกปฐมภูมิที่ไม่ระบายนเข้าสู่ระบบพอร์ทัลหรือเนื้องอกที่มีการแพร่กระจายของตับ ดังนั้นการเตรียมตัวสำหรับวิกฤตคาร์ซินอยด์จึงเป็นสิ่งสำคัญ

สรุป

เทคนิคการดมยาสลบถือว่าจำเป็นในการป้องกันการปลดปล่อยคาร์ซินอยด์ จากความเครียดที่เกิดจากการเหนี่ยวนำระหว่างการดมยาสลบ การใส่ท่อช่วยหายใจหรือการจัดการเนื้องอก វិស្តុញ្ញីแพทย์จึงควรต้องเข้าใจความแปรปรวนของอาการทางคลินิก และภาวะแทรกซ้อนที่อาจเกิดขึ้นระหว่างการผ่าตัดตลอดจนทางเลือกต่างๆ ในการรักษา

คำสำคัญ : กลุ่มอาการคาร์ซินอยด์, วิกฤตคาร์ซินอยด์, เนื้องอกต่อมไร้ท่อ

Carcinoid Crisis during General Anesthesia

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Abstract

Introduction

Though a neuroendocrine tumour was found infrequently, it was not considered rare as it could be metastasized and secreted its bioactive substances, namely serotonin, histamine and kinin peptides. Patients with this kind of tumour were not regularly found their symptoms so that it could not be easily predicted its severity of perioperative complications. Anaesthetic technique therefore challenging in preventing carcinoid crisis during its perioperative period.

Presentation of case

A 75-year-old obese woman with diagnosed well-controlled primary hypertension and diabetes mellitus type two, was admitted in Koh Samui hospital two months ago because of rapid rate atrial fibrillation and deep vein thrombosis.

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She did a Computed Tomography (CT) scan for causes of deep vein thrombosis and was accidentally found 2.5 cm. mesenteric mass at mid-upper abdomen, favours carcinoid tumour, yet she has not been found any other symptoms of carcinoid syndrome. She went through a surgery and developed carcinoid crisis during the operation.

Discussion

Carcinoid crisis may produce life-menacing perioperative hemodynamic instability with mainly occurs with primary tumours that do not drain into the portal system or tumours with hepatic metastases. Therefore, preparing for carcinoid crisis was an important thing for this patient due to her primary tumours originated from ileum and jejunum, which have high incidence of hepatic metastasis.

Conclusion

Anaesthetic technique is considered essential in preventing carcinoid release from stress caused by the induction of anaesthesia, intubation, or tumour manipulation. Anaesthesia providers, thereby, should be able to understand not only the variability of the clinical manifestations or perioperative complications which are often associated with this syndrome, but also its choices of treatments.

Keywords : Carcinoid syndrome, Carcinoid crisis, Neuroendocrine tumour, Sandostatin.

Introduction

A neuroendocrine tumour is a leisurely growing tumour, which the incidence recently reported between 0.2 and 10/100,000 and archetypal diagnosed either between ages of 25 to 45 or over 60 years.¹ There are 20 bioactive substances, especially serotonin, histamine and kinin peptides, being secreted and are remarkable causative to carcinoid syndrome.² Most patients with this tumour are asymptomatic since all substances can be metabolized into inactive form by the liver. However, if the primary tumours are not drained into the portal system or there are hepatic metastases, these substances can later cause carcinoid symptoms.¹ Interestingly, more than a half of patients with primary tumours from pancreas, jejunum, ileum, or colon have been found the hepatic metastases, meaning that they could have been found more nonmetabolized substances.¹

Typical carcinoid symptoms, in addition, are considered labile blood pressure, cutaneous flushing, bronchoconstriction and diarrhea.³ Anaesthetic technique in patients with neuroendocrine tumour is, therefore, necessary as the carcinoid crisis can occur during induction of the anaesthesia, intubation, or manipulation of tumours.⁴

Carcinoid crisis resemble carcinoid symptoms but more severe; severe flushing, dramatic changes in blood pressure, cardiac arrhythmias, bronchoconstriction, and mental status changes.

Somatostatin is a cyclic peptide inhibits Gastrointestinal (GI) motility, gastric acid production, pancreatic enzyme secretion, bile and colonic fluid secretion, therefore can relieve carcinoid symptoms. But somatostatin has short duration therefor somatostatin analogs have been created.

There are five subtypes of somatostatin receptors, found in neuroendocrine tumours with dominance in the receptor type 2 (SST2) and the receptor type 5 (SST5).² The Sandostatin (octreotide) and Somatuline (lanreotide) are, thereby, considered as drugs of choice since they can be bound with the highest affinity to the mentioned subtypes 2 and 5 of somatostatin receptors.

Presentation of case

A 75-year-old woman with 153 cm. tall, 70.3 kg weight, 30 kg/m² BMI, well-controlled primary hypertension and diabetes mellitus type two was admitted two months ago with rapid rate atrial fibrillation and deep vein thrombosis. She has been examined for causes of deep vein thrombosis by the physician through the abdominal CT scan and accidentally found 2.5 cm. mesenteric mass at the mid-upper abdomen (from distal jejunum to proximal ileum) suspected carcinoid tumour. After receiving the treatment until deep vein thrombosis subsided, she still has atrial fibrillation with rate 70-80 bpm, her echocardiogram showed good LVEF with neither sign of carcinoid heart disease nor intracardiac clots.

The patient has been later admitted doing surgery for mesenteric mass excision again. The medications treated were warfarin 1.5 mg per day, metoprolol 100 mg per day, hydrochlorothiazide (HCTZ) 25 mg per day, and simvastatin 10 mg per day. Her examination still showed an atrial fibrillation rate of 70 bpm, baseline systolic blood pressure around 110-120 mmHg, and 60-70 mmHg diastolic blood pressure. Any carcinoid symptoms have not been yet found, and the serotonin analogue has not been taken before the surgery.

Moreover, the preoperative physical examination revealed irregular heart rhythm while other physical examination and airway evaluations were unremarkable. The vital signs were also within the normal limits together with the preoperative laboratory investigation revealed normal blood count, liver function test and blood glucose but abnormal electrolytes (hypokalaemia and hyponatremia), The CXR showed mild cardiomegaly, and the EKG showed atrial fibrillation.

Before surgery, warfarin was bridged into enoxaparin until proper INR. The 100 mcg of octreotide was, then, given subcutaneously 24 hours prior surgery time, ICU had been confirmed, all electrolytes had been achieved corrected, and blood components had been reserved.

On the day of doing the surgery, metoprolol was given at a usual dose in the morning together with the hydrocortisone, ranitidine, and a benzodiazepine while the Sandostatin was prepared. In this case, general anesthesia was preferred for avoiding sympathectomy caused by neuraxial anesthesia.

During perioperative period, the routine non-invasive monitoring was established. The patient has been examined and reported that her initial blood pressure was 140/80 mmHg, heart rate was 70 beats/min, and SpO₂ was 99% in room air. The force air warmer was used starting from the beginning for prewarming. Invasive arterial line insertion was also performed simultaneously of preoxygenation before induction of anesthesia. Intravenous propofol was later given with arterial line monitoring for real time blood pressure adjustment followed by intravenous cisatracurium 0.15 mg/kg before intubation with a video laryngoscope. In the meantime, general anesthesia was maintained with positive pressure ventilation, inhalation agents (sevoflurane, nitrous oxide), a nondepolarizing muscular blocking agent (cisatracurium) and an opioid (high dose fentanyl 2 mcg/kg). The nasal temperature was, then, monitored for adequate body temperature. After blood sugar was checked every hour, the operation was uneventful until the manipulation of the carcinoid tumor. It has been found that there was a dramatic change in blood pressure and heart rate followed by a sudden decrease of oxygen saturation, increasing in airway pressure and facial skin flushing. The blood pressure was rapidly swinging between systolic blood pressure 60-160 mmHg and diastolic blood pressure 30-80 mmHg, and the oxygen saturation was about 88%. The surgeon, then, stopped manipulation, and a 100 mcg Sandostatin was rapidly given to the patient intravenously as all symptoms were dramatically

subsided, the blood pressure and heart rate became stable, and the oxygen saturation raised to 95%. However, the operation was proceeded again uneventfully and successfully done within 3 hours. After the operation, the patient went through an emergence period of anesthesia safely and was extubated smoothly before being transferred back to the intensive care unit (ICU) for the following intensive postoperative care.

During the postoperative phase, the patient has stayed in the intensive care unit (ICU) with the arterial line monitoring and fentanyl patient-controlled analgesia (PCA) for postoperative pain.

The pathology report has been delivered back within two weeks after the surgery, interpreted as neuroendocrine tumor from distal jejunum and proximal ileum.

Discussion

The patient was considered in the groups of ages typically diagnosed neuroendocrine tumors. She has not been found any symptoms, yet her tumors originated from the ileum and jejunum could have been hepatic metastasis. Before the surgery, she has been transferred for echocardiography ensuring having no carcinoid heart disease nor intracardiac clots from her atrial fibrillation. Sandostatin (octreotide) was, then, given subcutaneously 24 hours prior to the surgery to reduce hormonal release and inhibit the action of circulating mediators by binding to the subtype two somatostatin receptors of the neuroendocrine tumors.

Although the medical reported that not every patient has been found developing carcinoid syndrome, such development is still possible. For premedication, the patient has been given anxiolytic for preventing stress which could trigger the release of serotonin, antihistamine blocking the effects of histamine, steroid and inhibiting the action of bradykinin. The general anesthesia has been chosen to avoid a sympathectomy caused by neuraxial anesthesia while preparing the Sandostatin in the operating room.

The other three most essential periods which could precipitate the symptoms were induction of anesthesia, intubation, and manipulation of tumors. Before installing anesthesia, a forced-air warmer were started prewarming and the patient was gained attention through discussion. This was able to reduce the patient's anxiety before installing anesthesia. The catheter, then, was inserted on her radial artery after having injection of the local anesthetic drug for invasive blood pressure

monitoring while processing the preoxygenation.

The propofol has been chosen for induction for its profound effect in repressing the sympathetic response to intubation. Through induction, the arterial line has been used for monitoring preventing the hypotension that may trigger mediator release. The cisatracurium was also chosen as a muscular blocking agent causing no histamine release. The succinylcholine was not used for its use was still debatable. After all, the fasciculation might increase intraabdominal pressure and trigger mediator's release.

In the phase of intubation, a video laryngoscope has been used for a better laryngeal view helping successful intubation at the first attempt. The blood pressure was also monitored and adjusted via arterial line at the time of intubation.

The maintenance phase has been done applying a balance technique with positive pressure ventilation, sevoflurane, and nitrous oxide as inhalation agents, cisatracurium as muscular blocking agent, and the fentanyl, which was not able to cause histamine releasing opioid. The depth of anesthesia was later checked preventing light anesthesia. The ventilator setting was adjusted for normocarbida and adequate oxygenation. The temperature was then monitored, blood sugar was checked due to both hypothermia and hypoglycemia could later precipitate mediator's release.

The operation went smoothly until manipulation of tumors, carcinoid crisis occurred; labile blood pressure and heart rate, bronchoconstriction with desaturation, and facial flushing, and the manipulation was immediately stopped. Rapid intravenous injection of 100-mcg Sandostatin was given to the patient, and the carcinoid crisis was dramatically subsided within a minute. Blood pressure returned to normal, the airway pressure decreased to normal, and the desaturation was receded, yet the facial flushing was still. The operation has been continued successfully, and the patient was extubated safely after the surgery.

Sandostatin (octreotide) was a synthetic analogue of somatostatin reducing the production of hormonal release and inhibiting the action of circulatory mediators by binding to subtype 2 somatostatin receptors of tumors. There was a 1.5-2-hour half-life given intravenously. The doses of 50-200 mcg intravenous were effective in quickly conversing severe hypotension and bronchospasm. Though Sandostatin was diluted in 20-200 mL volumes and infused intravenously over 15-30 minutes or IV push over 3 minutes, a rapid bolus can

be done in carcinoid crisis mentioned in FDA; 1 mg of Sandostatin was given a rapidly intravenoys injection to healthy volunteers, resulted no serious ill effects.

The alpha agonists have bot been given for resolving bronchospasm as it has already been relieved with a Sandostatin. Although alpha agonists may help converse bronchospasm, adrenergic stimulation may later increase histamine release and aggravate symptoms.

The postoperative phase was another main period which was considered close monitoring for signs of carcinoid symptoms and controlling best postoperative pain which was essential, and the Fentanyl patient-control analgesia had been chosen as a reason of lacking histamine release.

Conclusion

Though a neuroendocrine tumor was found infrequently, it was not considered rare since the carcinoid crisis is critical due to its dramatic hemodynamic changes and challenging to be predicted. The problematic incident found were not regularly relevant to the severity of the symptoms before having surgery. There were main periods threatening the crisis, namely induction of anesthesia, intubation, and manipulation of tumors. It has been found that the Sandostatin played and important role in relieving the symptoms. Therefore, advising risks for the patient, planning, and communication between multidisciplinary were considered crucial factors for accomplishing the operation.

Disclosure

The patient provided consent allowing us to publish this case report.

Conflicts of interest

All of the authors have no conflicts to declare.

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