

CLINICAL CHALLENGES FOR ANESTHESIOLOGIST FACING PATIENT WITH ACROMEGALY. CASE REPORT

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Keywords: acromegaly, anesthesia management, difficult intubation, cardiovascular complications.

Summary

Background and objectives: Acromegaly is endocrinal disorder which results in changes involving general appearance as well as upper airway abnormalities, cardiovascular and metabolic disorders which can aggravate the anesthesia and can lead to complications. We aim to discuss the challenges for anesthesiologist that occurs facing patient with acromegaly and are necessary to investigate before performing any kind of intervention.

Case Presentation: 79 years old male patient presented the hospital with recently diagnosed acromegaly for rectal prolapse surgery. From anamnesis he had NYHAIII with cardiomyopathy, atrial fibrillation and arterial hypertension, also multiple old compressive fractures Th10 – L5. He was graded with Mallampati score IV and ASA class IV. The complementary examinations were made to assess the possible complications. In induction of general anesthesia the intubation was performed using fibro- bronchoscope and anesthesia went without complications except hypotension which was managed. After surgery the patient was led to the postoperative room for further monitoring.

Discussion and Conclusion: Acromegalic patients have an increased risk of difficulty during anesthesia compared to general population due to difficult intubation, cardiovascular complications, OSA, alteration in intraoperative glucose intolerance and fluid regulation. Therefore profound investigation and assessment are necessary to predict and prepare for possible difficulties in the surgery room.

Introduction

Acromegaly is clinical syndrome described as an excessive secretion of growth hormone (GH) by hypophysis that stimulates hepatic secretion of insulin-like growth factor-1 (IGF-1) which causes clinical manifestations. The total prevalence ranges between 2.8 and 13.7 cases per 100,000 people and the most common cause of GH hypersecretion is a somatotrophic adenoma of the anterior pituitary which is mostly being diagnosed by the age from 40 to 50 (1). Clinical features of acromegaly are due to high serum concentrations of growth hormone (GH) and insulin-like growth factor-1 (IGF-1) which have both somatic and metabolic effects who ranges from subtle signs of acral overgrowth, soft-tissue swelling, jaw prognathism to facial and skeletal disfigurement, severe headache, sleep apnea, severe hypertension, and respiratory and cardiac failure(2). The clinical manifestations which are to be the most alerting for anesthesiologist include upper airway abnormalities which result in difficult intubation because of extended mandible as well as because of macroglossia, enlargement and distortion of glottic structures, vocal cord swelling. It is reported that difficult intubation is three times more common among patient with acromegaly than in other surgery patients (3). Other challenges in anesthesia include obstructive sleep apnea (OSA) which is occurring in up to 70% of individuals with acromegaly and it can lead to postoperative hypoxia and increased risk of postoperative complications (4). Cardiovascular manifestations include: left ventricular hypertrophy and hypertension, development of systolic and diastolic dysfunction and reduced left ventricular ejection fraction and finally cardiac failure (5). Hypertension occurs in 20 – 51% of patients with active acromegaly and aggravates cardiomyopathy, atherosclerosis and cardio and cerebrovascular disease (6,7).

We aim to discuss the challenges for anesthesiologist that occurs facing patient with acromegaly and are necessary

to investigate before performing any kind of intervention.

Case Presentation

79 years old acromegalic male patient presented to the hospital for surgical rectal prolapse treatment on July 2018. From anamnesis it was known that acromegalia started to manifest at the age of 25 with feet's, palms and facial structures largening. The enlargement of the limbs continued till 45 years old. Although the patient was diagnosed with acromegaly at 2018.02 (at the age of 79) when he came to emergency department because of severe dyspnea.

Endocrine system : acromegaly

Cardiovascular system : Cardiomegaly , arterial hypertension and chronic atrial fibrillation. NYHA III (due to limitation of physical activity, presenting fatigue, palpitations or dyspnea due to ordinary activity).

Digestive system : rectal prolapse

Urinary tract and reproductive system : urinary retention

Skeletal system : Multiple old compressive fractures Th10 – L5.

Patient's medication : Amiodarone 400mg, Rivaroxaban 15mg, Torasemide 10mg, Spironolactone 50mg and Perindopril 2.5mg and Lanreotide 120mg inj. (Lanreotide is specific treatment for acromegaly, with its structure is similar to hormone somatostatin and it inhibits IGF-1, glucagon and other gastrointestinal peptides secretion)

Clinical examination : hypersthenic body type. During the lung auscultation fines crackles were heard, RR (respiration rate) 19 times/min. Heart auscultation confirmed arrhythmia, HR 88 beats/min (heart rate), ABP was 130/95 mmHg (arterial blood pressure).

The blood results revealed: light anemia (Hb=96 g/l), red blood cell count was slightly low 3.08×10^6 /l, coagulation was normal (APTT=30.1sec), normokalaemia (K=3.3 g/l) and normonatremia (145 g/l).

For rectal prolapse operation it was decided to perform general anesthesia instead of spinal regarding the following findings: cardiomegaly. In preoperative approach cardiovascular examination showed:, ECG showed atrial fibrillation, episodes with ventricle tachycardia and extrasystoles, NYHA class III. Patient's Mallampati score was graded class IV and ASA IV.

Induction of anesthesia contained: Midazolam 1mg, Fentanyl 0.1mg, Propofol 150mg and Tracrium 50mg. The endotracheal intubation was performed with fibro bronchoscope and 7.5mm tube was placed. ALV (artificial lung ventilation) was set with volume support mode. General anesthesia lasted 120min and during this time ephedrine 2x5mg i/v was used to correct hypotension and 1000ml of Ringer was given.

To reduce postoperative pain patient received ketonal

100mg i/v and paracetamol 1g i/v and for prevention of nausea ondansetron 8mg. After operation the patient was led to the postoperative room for further monitoring.

Discussion

Acromegalic patients have an increased risk of difficulty during anesthesia compared to general population. It includes 1. Difficult intubation; 2. Increased dosage of midazolam and fentanyl and less amount of thiopental and currares, 3. OSA 4. Intraoperative glucose intolerance and fluid regulation may be altered. 5. Cardiovascular manifestations include: left ventricular hypertrophy and hypertension, development of systolic and diastolic dysfunction and reduced left ventricular ejection fraction and finally cardiac failure (5). Hypertension occurs in 20 – 51% of patients with active acromegaly and aggravates cardiomyopathy, atherosclerosis and cardio and cerebrovascular disease (6,7).

Factors that contributes to complicated intubation are macroglossia, enlargement and distortion of glottic structures, vocal cord swelling and that leads to enlargement of neck circumference and decreased neck extension (8). The literature indicates that difficult intubation can be predicted by using following means such as MMC, the Cormack – Lehane grade, the simplified predictive intubation difficulty score, the upper lip bite test, measurement of thyroidch distance and confined neck movement. Usually a tracheal time exceeds 1min, successful intubation is made by 2 or more attempts. There are some preoperative objective tests that might help to evaluate the upper airway permeability: CT or MRI of neck, although it is mentioned in literature that more precise test is computational fluid dynamics using CT images[9]. This test shows increased airflow pressure in the pharyngeal area compared to non-acromegalic patients which is an indicator of possible difficult intubation. Independent risk factor of difficult intubation in acromegalic patients is IGF-1 levels. (8)There was significantly increased levels of IGF-1 in acromegalic patients with difficult intubation compared to non-complicated intubation cases. It is suggested to consider measurement of IGF-1 as the most critical of the variables used in preoperative assessment. In our case to predict challenging intubation only preoperative anesthetic interview was made and Mallampati was evaluated as class IV. Also cervical roentgenogram was made to investigate the possible vertebral fractures that could aggravate the intubation – no fractures were found.

Another difference reported in the literature is an increased dosage of midazolam and fentanyl and less amount of thiopental and currares (10) used during general anesthesia. Although in our case the management of anesthesia didn't require additional drug doses.

60 - 70% acromegalic patients have OSA (obstructive sleep apnea)(4,11). It is an important condition, because metaanalysis have showed that OSA is associated with high odds of desaturation, reintubation and transfer to the ICU during the postoperative period. It is important to check patient's medical history for this disease. If necessary, EPWORTH questionnaire can be made to diagnose it. Whereas in our case the patient didn't have OSA.

Cardiac complications are often present in acromegalic patients and it is the principle cause of premature mortality in these patients accounting for about 60% (12). Acromegalic patients due to GH and IGF-1 exert present cardiac remodeling which causes left ventricular hypertrophy, increased risk of arrhythmias, systolic and diastolic dysfunction that leads to congestive heart failure (usually in older patients). Arterial hypertension is also present in 35% of patients and it ranks among most important negative prognostic factors for mortality. Cardiac function is evaluated as general population: heart auscultation, NT-proBNP to evaluate heart failure, ECG, echocardiography. For our patient in preoperative cardiac assessment heart auscultation and ECG was made which showed atrial fibrillation, episodes with ventricle tachycardia and extrasystoles. Moreover the medical history revealed existing cardiomegaly. However, during the operation any cardiovascular complications were present only additional ephedrine doses were required to treat hypotension.

Conclusions

The main clinical challenges for an anesthesiologist facing patient with acromegaly are difficult intubation and present cardiovascular complications which can lead to mortal outcomes. Therefore profound investigation and assessment are necessary to predict and prepare for possible difficulties in the surgery room. Despite all the objective tests and its' improvements, the profound preoperative anesthetic interview remains critical for successful anesthesia and surgery.

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KLINIKINIAI ANESTEZIOLOGO IŠŠŪKIAI SU PACIENTU, SERGANČIU AKROME GALIJA J. Gudaitytė, J. Jermolajevaitė, M. Judickas

Raktažodžiai: acromegalija, anestezija, apsunkinta intubacija, kardiovaskulinės komplikacijos.

Santrauka

Įvadas ir darbo tikslas. Acromegalija yra endokrininės sistemos sutrikimas, kuris pasireiškia ne tik specifiniais išvaizdos pokyčiais, bet ir viršutinių kvėpavimo takų, kardiovaskulinės sistemos ir metaboliniais sutrikimais, kurie lemia apsunkintą anesteziją ir gali sukelti komplikacijas jos metu. Šio darbo tikslas - apžvelgti

iššūkius, kylančius anesteziologui, kai pacientas serga akromegalija ir nustatyti galimus pakitimus prieš atliekant bet kokią numatomą intervenciją.

Klinikinis atvejis. 79 m. vyras, sergantis akromegalija, buvo hospitalizuotas dėl tiesiosios žarnos prolapsu ir numatomo operacinio gydymo. Iš anamnezės žinoma, kad pacientui nustatyta NYHA III klasė su kardiomiopatija, serga prieširdžių virpėjimu ir arterine hipertenzija. Taip pat pacientui nustatyti daugybiniai seni Th10 – L5 stuburo slankstelių lūžiai. Objektiviai anesteziologo jis buvo įvertintas Mallampati IV klase bei ASA IV klase. Papildomi tyrimai buvo atlikti siekiant įvertinti galimas komplikacijas dėl akromegalijos. Nuspręsta taikyti bendrinę anesteziją vietoj spinalinės dėl esamos kardiovaskulinės būklės. Bendrinės anestezijos indukcijos metu intubacija atlikta fibrobronchoskopo kontrolėje ir anestezija praėjo be komplikacijų, išskyrus hipotenzijos epizodą, kuris

buvo suvaldytas. Po operacijos pacientas palydėtas į pooperacinę palatą, kur toliau buvo stebimos jo gyvybinės funkcijos.

Diskusija ir išvados. Pacientai, sergantys akromegalija, turi didesnę riziką komplikuotai anestezijai nei bendroji populiacija dėl apsunkintos intubacijos, kardiovaskulinių komplikacijų, miego apnėjos, pakitusios gliukozės ir skysčių reguliavimo mechanizmų intraoperaciniu laikotarpiu. Dėl šių priežasčių turi būti atliktas nuodugnus paciento būklės ištyrimas bei įvertinimas, kad nuspėtume ir pasiruošti galimiems sunkumams operacinėje anestezijos metu.

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