



CASE REPORT: ANESTHETIC MANAGEMENT OF A PATIENT WITH THYROTOXICOSIS POSTED FOR THYROID SURGERY UNDER GENERAL ANESTHESIA

Anaesthesiology

Dr. Tanmoy Biswas

Dr. Tarit
Chatterjee

ABSTRACT

Graves associated thyrotoxicosis is a condition which is very much challenging for an anesthesiologist. It mainly manifests as a hypermetabolic state resulting in sympathetic stimulation. If the patient is not made euthyroid preoperatively then it can easily turn into a serious condition intraoperatively. Here we will report anesthetic management of a thyrotoxicosis patient posted for thyroid surgery under general anesthesia.

KEYWORDS

INTRODUCTION

Thyrotoxicosis is defined as a state of thyroid hormone excess and is not synonymous with hyperthyroidism which is a result of excess thyroid function. One of the major etiology of thyrotoxicosis is graves disease. It accounts for 60-80 % of thyrotoxicosis. The prevalence varies among populations, reflecting genetic factors and iodine intake. Graves disease occurs in upto 2 % in women but is one tenth frequent in men. The disorder begins before adolescence and typically occurs between 20 and 50 years of age, it also occurs in elderly.

Symptoms of graves disease include weight loss, palpitations, sweating, diarrhoea, polyuria, hyperactivity, heat intolerance. Signs include tachycardia, tremor, goiter, warm moist skin, muscle weakness, eye lid retraction. All these features develop due to the sympathetic stimulation resulting in increased beta adrenargic activity. The patient's cardiac status should be monitored closely both intra and post operatively as there is chance of development of supra ventricular arrhythmia.

Patients with graves disease developing thyrotoxicosis should be made euthyroid before surgery.

Here we will report a case of perioperative management of a 15 year old girl with graves associated thyrotoxicosis posted for thyroid surgery under general anesthesia

Case Report

We report the case of a 15 year old girl (indian origin, high socioeconomic status) who got admitted with a large swelling in the neck posted for thyroidectomy. She first noticed the swelling 6 months ago and the size gradually increased. She had no history of surgery, but she was diagnosed with graves disease 3 months back. She was on neocarbamazole, propranolol, ivabradine and chlorthalidone for the past 3 months. She was currently 49 kg and reported 3 kg weight loss in the last two months. A preoperative routine checkup was done. All blood parameters were within normal limit except for tsh which was 0.001mu/l. Ecg showed sinus tachycardia with a rate of 130 beats / minute. Blood pressure was 130/70 mm hg. In resting state. Patient was febrile with temperature of 38.5 c. Airway assessment was done and showed mallampatti grade 1 with no compression of trachea or stridor.

Endocrinology referral was done and the patient was started on lugols iodine solution 6 drops thrice daily. The patient was discharged and to be reviewed again after 2 weeks. When the patient again got admitted her tremors decreased and resting heart rate was 96 beats / minute, she was afebrile and blood pressure was 100/60 mm hg. High risk consent was taken from her parents and they were explained about the serious risks. She was kept nil per mouth for 6 hours before operation and was advised to take all the medications that she took in the morning with sips of water.

Upon arrival in the operative room, blood pressure, ecg, pulse oxymeter was connected. Baseline blood pressure was 110/70 mm hg, heart rate was 85 betas/ minute, saturation was 98% in room air. Peripheral intravenous line was done and she was oxygenated for 5 mins with 100 % oxygen using a face mask. Pre operative medications

given included 1 mg midazolam, 4 mg ondasteron, 0.2 mg glycopyrolate and 8 mg dexamethasone. Induction was done using 100 mg propofol, 100 mcg fentanyl and 10 mg cis -atracurium. She was intubated with a 6.5 mm cuffed armored endotracheal tube and put on volume control mechanical ventilation. To prevent the laryngoscopic surge 1 mg of metoprolol was given 2 minutes before induction. Confirmation of position of endotracheal tube was done by bilateral chest auscultation and capnography. Tidal volume was set at 400 ml, respiratory rate at 14/ minute and pEEP of 5 cm h₂O was given. Maintenance was done using sevoflurane at 1 MAC, oxygen and nitrous oxide at 1:1, and cis atracurium infusion was started at 0.1 mg/kg/hr. Invasive blood pressure monitoring and neuromuscular monitoring device was connected. For analgesia, she was given 6 mg morphine and 1 gm paracetamol. Ryles tube was inserted and positioning was confirmed. Intraoperatively her vitals remained as below.

	MAXIMUM VALUE	MINIMUM VALUE
HEART RATE	96/min	67/min
BLOOD PRESSURE	126/78 mmHg	90/54 mmHg
END TIDAL CO ₂	39kPA	28kPA
SATURATION	100%	98%
TEMPERATURE	36	34

The procedure was completed without any complications and the surgical site was infiltrated with 20 ml 0.5 % ropivacaine. Prior to extubation 5 mg labetalol was given. Extubation was done at TOF ratio 1. The patient was shifted to intensive care unit post operatively for monitoring the next 48 hours. Following this, she was discharged from the hospital without any complications.

DISCUSSION

Thyrotoxicosis has always been a challenging case for an anesthesiologist. Due to the sympathetic stimulation and beta adrenargic activity there are chances of cardiovascular instability. Another important aspect of graves associated goitre is airway. Although in our case the size of the goitre was relatively small and no tracheal compression, airway was secured without any problem. But where difficult airway is anticipated, fiberoptic bronchoscopy should be done. Making the patient euthyroid is the most important step before surgery. In our case, the patient was started on lugols iodine solution, after which her symptoms gradually decreased. Although serum tsh again came as 0.001 mu/l, we still proceeded for the procedure as surgery was the last step for controlling the thyrotoxicosis.

For pre operative management of thyrotoxicosis patient, beta blockers plays a very important role. She was already on propranolol, so intraoperatively to prevent the laryngoscopic surge, metoprolol played a very important role and labetalol also helped during extubation.

Another aspect is the pain management. In our case we used opioids as they act on the delta receptors and blunt the sympathetic response. NSAIDs were avoided as they can exaggerate the thyrotoxicosis. Corticosteroids should be used if adrenal insufficiency develops due to the thyroid storm. Thus invasive blood pressure monitoring is recommended in thyrotoxicosis. Although glycopyrolate can affect the hemodynamics, in our case it didn't affect the hemodynamics.

Adequate muscle relaxation, pain control and depth of anesthesia plays an important role in preventing the sympathetic upsurge.

Thyroid storm is an important complication that can occur while handling the thyroid gland. Less manipulation of trachea was done during intubation. In several cases thyroid storm developed due to the inadequate pain control and the depth of anesthesia. Using only esmolol infusion may not be the only way to prevent thyroid storm.

Thus in conclusion the recommendations for decreasing the risk of thyroid storm during thyroid surgery in a case of thyrotoxicosis are:

1. Make the patient euthyroid
2. Preoperative heart rate must be less than 100 beats/ minute
3. Adequate pain control intra and post operatively
4. Adequate muscle relaxation and depth of anesthesia
5. Use of beta blockers
6. Good communication between surgeon and anesthesiologist
7. Post operative intensive care unit
8. Proper awareness of all the staffs in the room regarding thyroid storm

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