

CASE REPORT

ANAESTHETIC MANAGEMENT OF PREGNANT PATIENT WITH UNCONTROLLED HYPERTHYROIDISM FOR EMERGENCY CAESARIAN SECTION

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ABSTRACT: The anaesthetic management of patient with uncontrolled hyperthyroidism requiring emergency cesarean section is presented here. Elevated free T3 and T4 and severely suppressed TSH levels confirmed the diagnosis. Propyl thio uracil was started preoperatively. IV Metoprolol was used to control the pre-operative heart rate. After adequate preloading with crystalloids, spinal anaesthesia was administered. There were three episodes of hypotension and tachycardia which were successfully managed with small dose of IV Phenylephrine. Post-operative anaesthesia was administered through epidural catheter. Patient was observed in intensive care unit for congestive cardiac failure and thyroid storm. Anti-thyroid drugs, Propranolol and Dexamethasone were given in the post-operative period.

KEYWORDS: Hyperthyroidism, Graves' disease, pregnancy, anesthesia, emergency surgery.

INTRODUCTION: Graves' disease is the most common cause of hyperthyroidism occurring in 0.1 to 1% of all pregnancies.^[1] Other causes of hyperthyroidism in pregnant patient are toxic multi-nodular goiter, sub-acute thyroiditis, adenoma and iodine induced thyrotoxicosis. Regardless of etiology, the signs and symptoms of hyperthyroidism are those of a hyper metabolic state.^[2] Thyrotoxicosis is potentially a life threatening condition. Surgery in an uncontrolled thyrotoxicosis may trigger thyroid storm.^[3]

Minimal information is available in the literature on anaesthetic management of cesarean section in uncontrolled thyrotoxicosis. We report a case of uncontrolled hyperthyroid pregnant patient who underwent emergency caesarian section under spinal anesthesia.

CASE REPORT: A 26 year old, 45 Kg, woman in 36 weeks of gestation, was admitted to a private hospital for safe confinement.

With history of palpitations and intolerance to heat since one week, patient presented in early labor. Patient had a past history of diagnosed hyperthyroidism 2years back and was receiving tab. Carbimazole 10 mg twice daily. However, patient discontinued the treatment after a year.

On examination, her heart rate (HR) was 166 bpm, in sinus rhythm and Blood pressure (BP) was 140/90 mm Hg. Her body temperature was normal. She had fine tremors; thyroid gland was diffusely enlarged and was confined to neck. Exophthalmos was observed. Her JVP was normal. Other systemic examinations were within normal limits.

Thyroid function test (TFT) revealed 404 ng/dl of Total T3 and 30 µg/dl of total T3 and TSH was less than 0.01 µ IU/ml, as measured by competitive chemiluminescent Immune Assay. Also, the free T4 was 15 pg/ml and free T4 was 6.5 ng/dl, as measured by chemiluminescent Microparticle Assay. Her hemoglobin was 10.4 gm/dl. Other routine investigations were unremarkable.

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Patient was advised on oral tab. Propranolol 40 mg and tab. Propyl thiouracil (PTU) 200 mg by the physician. Continuous monitoring of maternal and fetal heart rate (HR) was instituted.

Six hours after the onset of labor, patient was posted for emergency caesarian section because of the varying fetal distress. In the operation theatre (OT), her HR, BP was 160 bpm and 140/90 mm Hg, respectively. A combined spinal epidural anesthesia was planned.

Oxygen was supplemented through Hudson mask and patient was preloaded with 1000 ml Ringer Lactate solution. Inj. Ranitidine 50 mg and inj. Ondansetron 4 mg were given intravenously (IV). Intravenous Inj. Metoprolol was given in titrated doses, with total dose of 5 mg. After 15 minutes, HR was 120 bpm. Additionally, intravenous inj. Hydrocortisone 100 mg was given.

18G Epidural catheter was placed at L2-3 level following which intrathecal administration of 1.8 ml of Bupivacaine 0.5% (Heavy) with 60 mcg of Buprenorphine was carried out at a lower level.

Epidural catheter was inserted with the intention of obtaining for post-operative analgesia. Once adequate Sensory block up to T6 segment was obtained, procedure was carried out and safe extraction of baby was achieved.

During the procedure, the maximum raise in HR was 140 bpm and maximum fall in BP was 90/70 mm Hg. The episodes of hypotension were managed with 50 µg bolus doses of intravenous inj. Phenylephrine and IV fluids. Mean intra-operative HR was around 120 bpm. Three such episodes of fall in BP were recorded during entire procedure of one hour.

Newborn was small for gestational age, otherwise clinically euthyroid, which was subsequently confirmed with TFTs.

In post-operative period the patient was observed in intensive care unit for 3 days. Post-operative anaesthesia was provided through epidural catheter using 8 ml 0.125% bupivacaine with 50 mcg of buprenorphine 6th hourly for the next 2 days. Patient received tab. Propranolol 40 mg, twice daily and PTU 200 mg, 8th hourly and Dexamethasone, 2 mg every 6 hours. After 3 days, PTU was switched over to carbimazole 10 mg, at twice daily doses.

Rest of the course of the patient and new born in hospital was uneventful. Patient was discharged on 5th day.

DISCUSSION: Hyperthyroidism in pregnancy poses significant challenges to anaesthesiologist at various levels; from clinical diagnosis to anaesthesia management. Diagnosis of hyperthyroidism in pregnancy is difficult as the symptoms and signs of nervousness, sweating, dyspnea, tachycardia, and cardiac systolic murmur are also seen in most normal pregnancies. More specific findings such as weight loss, tremors, goiter and/or ophthalmopathy suggest a concomitant Graves' disease coexisting with the gestation.^[3]

Interpretation of TFT in pregnancy is complex. There is elevation in total T4 and T3 levels and suppression of serum TSH levels due to estrogen-induced increased synthesis of thyroid binding globulin (TBG) and human chorionic gonadotropin (hCG) levels in normal pregnancy. Hence diagnosis of hyperthyroidism should always be confirmed by the measurement of circulating free T₄ and TSH levels. Measurement of thyroid autoantibodies is also useful in detecting maternal Graves' disease and their presence correlate well with the occurrence of maternal and fetal complications.^[4]

Poorly treated or untreated maternal hyperthyroidism is associated with adverse outcome in pregnancy. Preeclampsia, abruptio placenta, preterm delivery and postpartum hemorrhage are very well associated thus makes the pregnancy "high risk" one.^[3, 4]

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Preoperative management of uncontrolled maternal hyperthyroidism depends on time available for preoperative preparation; however it is often rate limiting step for an anaesthesiologist. Establishment of euthyroidism with ATDs alone takes 6 -8 weeks.^[2, 5] In an emergency situation, as in our case, ATDs preferably Tab PTU 200 mg should be given orally, as soon as possible. ATDs should precede iodides at least by 2 to 3 hours.^[2]

If available, 5 to 8 drops of Lugol's iodine is to be given orally. Iodine preparations are commercially not available in many places of India. However unavailability precludes its use. Alternately, Sodium iopanoate 500 mg can be given orally. IV Beta blockers such as Esmolol and Metoprolol are preferred to control maternal heart rate, anxiety and tremors. Fetal HR should be monitored for bradycardia while its use since beta blockers cross placenta. Hydrocortisone 100 mg IV is to be administered, as these patients may have relative adrenocortical deficiency.

Halpern S H^[6] reported two cases of uncontrolled hyperthyroidism in pregnant patients who successfully underwent caesarean section, one under continuous epidural anaesthesia and another under General anaesthesia (GA).

Spinal anaesthesia (SA) can be safely administered if patient has no signs of cardiac failure.^[7] Patient should be adequately preloaded of crystalloids. Hypotension can be managed with IV fluids and smaller doses of direct acting alpha agonist such as Phenylephrine. Advantages of spinal anaesthesia like early detection of thyroid storm as patient is conscious overweighs the risks of precarious hypotension. This is because of the association of thyroid storm with the altered sensorium.^[8]

Placement of an epidural catheter carries additional advantage of continued post-operative anaesthesia. If time permits, Continuous epidural anaesthesia is may be preferred over subarachnoid block owing to its controlled sympathetic blockade effects.

Administering General anaesthesia (GA) is not without risks, it is deferred as far as possible. If GA is planned, airway is further complicated in association with pregnancy. Thiopentone may be the drug of choice for induction. During rapid sequence induction, IV Esmolol may be used to suppress the intubation response. Eyes care and temperature monitoring are additional concerns during G A. Latter is useful to detect thyroid storm under G A. Graves' disease and myasthenia gravis are often associated disorders,^[2,5] one need to be vigilant while administering muscle relaxants.

Uncontrolled hyperthyroidism may augment congestive cardiac failure^[7] and can precipitate thyroid storm^[8] following the surgery. Patient should be monitored and we should be prepared to manage these complications in the intensive care unit. PTU should be replaced by carbimazole or methimazole, as it is known to cause severe hepatotoxicity.^[3]

Beta blockers are required until the hyperthyroidism is controlled with ATDs. Iodine and corticosteroids should be continued in the post-operative period in order to avoid thyroid storm and can be withdrawn after a week.

Graves' disease typically worsens in the post-partum period, usually in the first 3 months after delivery. Higher doses of ATDs are frequently required during this period.^[3]

CONCLUSION: All pregnant patients should be thoroughly evaluated for thyroid disorders. Uncontrolled hyperthyroidism in pregnant patients is associated with several complications. Spinal anaesthesia can be safely administered in a patient with uncontrolled hyperthyroidism coming for emergency caesarean section. Antithyroid drugs, beta blockers and steroids should be started in

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preoperative period and should be continued in postoperative period. Patient should be observed and we should be prepared to manage thyroid storm and congestive cardiac failure in the perioperative period.

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