

with untreated severe hypothyroidism are predisposed to depression of myocardial function, decreased spontaneous ventilation, abnormal baroreceptor function, reduced plasma volume, anemia, hypoglycemia and electrolyte imbalance like hyponatremia.^[1] Administration of general or regional anesthesia in untreated hypothyroid state warrants special attention. This is not only because of the multisystem involvement in the hypothyroid state but also due to an increased sensitivity and duration of anesthetic drugs secondary to impaired drug metabolism in the liver.

A male patient aged 43 years presented to the emergency department with crush injury of the right hand. He was a known case of hypothyroidism for the past 6 years on irregular treatment. Clinical findings were unremarkable except for puffy skin over face and extremities. He weighed 62 kg, and his height was 153 cm. Routine laboratory investigations were normal. Electrocardiogram (EKG) showed right bundle branch block with inverted T waves in lead II, III, and all chest leads. Two-dimensional echocardiography revealed a normal study. Thyroid profile (by automated chemiluminescence immunoassay method) revealed the following values: 0.35 ng/dL (range: 0.80-1.78) of T3, 2.82 µg/dL of T4 (range: 6.09-12.23) and 95.14 µIU/ml (range: 0.34-5.6) of thyroid stimulating hormone (TSH). Oral thyroid replacement therapy was commenced with 100 mg of levothyroxine daily and IV hydrocortisone 200 mg was given. Emergency surgical debridement followed by groin flap was planned. Cervical epidural anesthesia (CEA) was administered with patient in sitting position and with 18-gauge Tuohy needle at C7-T1 level. Epidural catheter was advanced 4 cm cephalad. Patient was placed back in the supine position, and 5 ml of 0.5% bupivacaine was administered in a graded manner over 10 min. A segmental block of C4 to T3 was achieved. Monitoring consisted of EKG, invasive blood pressure along with blood glucose, pulse oximetry, temperature and central venous pressure. Meticulous care was taken to maintain the body temperature. Infusion of 0.375% of bupivacaine at the rate of 3 ml/h was given to facilitate surgery that lasted for 150 min. As the wound was contaminated, groin flap cover surgery was deferred. The catheter was retained, and patient was shifted to the recovery room. Two days later patient was scheduled for groin flap surgery. CEA was activated with 5 ml of 0.5% bupivacaine, followed by infusion of 0.375% bupivacaine at the rate of 3 ml/h. Spinal subarachnoid block was administered with 3 ml of 0.5% heavy bupivacaine at L3-L4 interspace. Surgery lasted for 135 min. Postoperative pain was managed with nonsteroidal anti-inflammatory drugs on both the occasions.

Cervical epidural block in emergency hand surgery for a patient with untreated severe hypothyroidism

Sir,

Perioperative management of a patient with severe hypothyroidism for emergent surgery is challenging. Patients

had an uneventful postoperative course. Patient was discharged from the hospital on the 8th postoperative day with

an advice to continue the oral thyroid replacement therapy and an endocrinologist opinion for future management of the hypothyroid status. On the day of discharge repeat thyroid profile showed 0.49 ng/dL of T3, 4.70 µg/dL of T4 and 72.67 µIU/ml of TSH. Consent for publication of this report was obtained from the patient.

Most hypothyroid patients are unusually sensitive to anesthetic drugs, have prolonged recovery times, or have a higher incidence of cardiovascular instability or collapse. Hypothyroidism is characterized by decreased T3, T4 and increased levels of TSH. TSH is a sensitive indicator of hypothyroid state. Silent coronary artery disease (CAD) is common in hypothyroid patients, and thyroxine replacement therapy may unmask the underlying CAD.^[1] Emergency treatment of severe hypothyroid patient with intravenous levothyroxine is associated with increased risk of precipitating myocardial ischemia. Thyroid replacement therapy needs meticulous monitoring of the patient with severe hypothyroid state.

The incidence of adrenocortical insufficiency is increased with a reduced adrenocorticotrophic hormone response to stress, therefore these patients should receive hydrocortisone cover during periods of surgical stress.^[2] The hypometabolic state of hypothyroidism necessitates careful perioperative cardiovascular monitoring and judicious use of anesthetic drugs and techniques. CEA is a known technique for hand surgery.^[3] CEA allows one to reduce the dose of local anesthetic considerably compared to other regional techniques such as brachial plexus block. In addition, administration of the peripheral nerve block is also technically difficult because of poor response to peripheral nerve stimulation.^[4-6] Polyneuropathy is more commonly associated with hypothyroid state. A unique case of a completely absent response to peripheral nerve stimulation prior to and after administration of neuromuscular blocking agent in normothermic and severely hypothyroid patient was reported.^[6] In the postoperative period the peripheral nerve stimulation was found normal after 8 weeks, when the patient was euthyroid and the neuromuscular monitoring response occurred only after administration of the thyroxine replacement therapy. Nonetheless, there are reports of having severe plexopathy after administration of the regional nerve blocks for the surgical procedures.^[7] These nerve conduction abnormalities usually revert back to normal over months with hormone replacement therapy.^[8] The rationale of choosing regional anesthesia technique over general is obvious. However, CEA is not without complications. In addition to the technical complications, the most important sequelae of CEA are of respiratory compromise because of phrenic nerve block and the impairment of intercostal muscle function along with cardiovascular effects because of sympathetic block causing bradycardia and hypotension.^[9] In the present case the dose

of local anesthetic used was also minimum because of the fear of local anesthetic toxicity in the hypothyroid state. As hypothyroid patients are known to have respiratory depression, cardiovascular instability and reduced baroreceptor reflexes that dictate close monitoring and prompt therapeutic intervention.

We believe that in the hands of an experienced anesthesiologist and an awareness of the anesthetic implications of untreated hypothyroidism, CEA is safe and may assist in providing a good outcome in cases like this.

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