

**Mini Review**

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# Anesthetic Considerations for Hypothyroidism and Pregnancy

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**\*Corresponding author:** Channing Twyner, Assistant Professor of Anesthesiology, University of Mississippi Medical Center, Jackson MS, USA.**Received Date:** July 21, 2023**Published Date:** August 25, 2023**Abstract**

Thyroid disorders are not uncommon in women of child bearing age. Because of the critical functions of thyroid hormone, unrecognized thyroid disease may result in both maternal and fetal complications. Hashimoto's thyroiditis is the most common cause of hypothyroidism in pregnancy in the western world and iodine deficiency is the most common cause worldwide. Pregnant patients with hypothyroidism may present with goiter. Goiters that are large enough to cause shortness of breath, dysphagia, compression of the recurrent laryngeal nerve, or superior vena cava syndrome may cause difficulty with airway management. Severe hypothyroidism may present with decreased cognition, bradycardia, hypothermia, hypoventilation, relative adrenal insufficiency and/or myxedema coma. Myxedema coma, the severest form of hypothyroidism, is best managed with mechanical ventilation, thyroxine replacement, warming measures, treatment of adrenal insufficiency, treatment of electrolyte abnormalities, and intensive care.

**Keywords:** Anesthesia; Pregnancy; Hypothyroidism; Myxedema coma; Hashimoto's thyroiditis**Introduction**

Hypothyroidism is characterized by an elevated TSH with (overt hypothyroidism) or without (subclinical hypothyroidism) decrease levels of thyroid hormone [1]. Overt hypothyroidism only occurs in 0.3-0.5% of pregnancies [1]. Overt hypothyroidism is characterized clinically by symptoms of fatigue, decreased exercise capacity, cold intolerance, constipation, hair loss, brittle nails, and weight gain. In the United States and much of the western world, the most common cause of overt hypothyroidism in pregnancy is Hashimoto's thyroiditis [1, 2]. However, iodine deficiency is the most common cause of hypothyroidism worldwide [1]. Similar to Grave's disease, Hashimoto's thyroiditis is associated with autoimmunity and goiter [1]. Thyroidectomy or radioactive iodine ablation are also common causes of overt hypothyroidism in pregnancy

[1]. Regardless of the cause, levothyroxine is the mainstay of treatment for overt hypothyroidism [3].

Myxedema coma is the severest form of hypothyroidism and requires intensive care. It is exceedingly rare but has a mortality rate of 50-60% despite treatment [4]. There are many precipitating factors, including infection, hemorrhage, cold exposure, sedatives, and cardiovascular events [5]. A pregnant patient with symptoms of hypothyroidism in addition to severe hypothermia and bradycardia should be suspected to have myxedema coma and treated with intensive care [4]. Intubation and mechanical ventilation are needed to correct hypoxemia and hypercarbia [4]. IV levothyroxine (T4) and liothyronine (T3) should be given as soon as possible [5, 6]. Because infection is a common cause, there should a low threshold

for administering broad spectrum antibiotics [4, 5]. Electrolyte abnormalities, including hyponatremia and hypoglycemia should be corrected [4,5]. Hydrocortisone is recommended because thyroid hormone administration may increase cortisol clearance and because patients with myxedema coma may have preexisting adrenal insufficiency [4].

## Discussion

There are several anesthetic considerations for pregnant patients with overt hypothyroidism that is not well managed. Physical examination of the airway, central nervous system, and cardiovascular system are essential to the preoperative evaluation of the pregnant patient with overt hypothyroidism. Goiters that are large enough to cause shortness of breath, dysphagia, compression of the recurrent laryngeal nerve, or superior vena cava syndrome may cause difficulty with airway management. Bradycardia, extreme fatigue, and altered mental status suggests uncontrolled hypothyroidism.

Preoperatively, it is important to make sure that the pregnant patient with hypothyroidism has been compliant with levothyroxine therapy and is euthyroid. If a pregnant patient is to undergo elective surgery, it is best to wait until the patient is euthyroid [6]. In addition, surgery in the pregnant patient is best done in second trimester, when the risk of spontaneous abortion and preterm labor is lowest [7]. Yet, the pregnant patient that must undergo thyroidectomy for medical reasons must not be denied surgery regardless of trimester [8]. Hypothyroid patients may have impaired respiratory responses to hypercarbia and hypoxemia, increased sensitivity to the respiratory depressant effects of sedatives, and increase sensitivity to the myocardial depressant effects of volatile and intravenous anesthetics [9]. Also, hypothyroidism is associated with obstructive sleep apnea [9]. The presence of ileus and delayed gastric emptying may put these patients at higher risk for aspiration [6]. Hypothyroid patients may be prone to ventricular arrhythmias [10] coronary artery disease [9], and a decreased response to phenylephrine [11].

Neuraxial techniques are preferred in most pregnant patients with hypothyroidism that need analgesia and anesthesia for labor and or cesarean delivery. Despite the association between hypothyroidism, platelet dysfunction, and decreased factor VIII [12, 13], there is no association between hypothyroidism and bleeding complications from neuraxial techniques. However, care should be taken to rule out historical bleeding diathesis. Patients with insufficient respiratory drive from severe hypothyroidism and myxedema coma should undergo general anesthesia for cesarean delivery. If there is a concern for cardiovascular collapse, invasive hemodynamic monitoring is warranted. With general anesthesia, hypothyroid patients may be extremely sensitive to the respiratory depressant effects of anesthetics and neuromuscular blockers [9]. Patients with myxedema coma may require mechanical ventilation for at least 24-48 hours while low thyroid hormone, hypothermia, deranged volume status, and electrolyte abnormalities are corrected [14].

## Conclusion

The pregnant patient patients with hypothyroidism and the presence of a goiter should be screened for potential airway compromise. If the pregnant patient with hypothyroidism requests analgesia and anesthesia for labor or cesarean delivery, neuraxial techniques are preferred over general anesthesia. In the case of the pregnant patient undergoing elective non-obstetric surgery, the second trimester is preferred. Early recognition of severe thyroid disease and prompt triage to intensive care may decrease mortality in the pregnant patient with myxedema coma.

## Acknowledgement

None.

## Conflict of Interest

No conflict of interest.

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