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Endocrine emergencies in pregnancy

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Endocrine emergencies in pregnancy are rare and are more likely to occur in the absence of good obstetric care. Serious thyroid and diabetes related events in pregnancy are more common because of their higher prevalence in the normal population. Pituitary complications in pregnancy are now relatively rare. A high index of suspicion is needed for early diagnosis, and medical treatment is directed primarily at maintaining maternal hemodynamic stability. A close liaison between an endocrinologist, maternal-fetal specialist and intensivist is critical in optimising both maternal and fetal outcomes.

Endocrine emergencies in pregnancy

Acute thyroid complications in pregnancy

During pregnancy, the hypothalamic-pituitary-thyroid axis undergoes significant adaptation to accommodate the growing fetus. There is an increased demand for thyroid hormone during pregnancy and the normal thyroid gland is able to hypertrophy and meet this demand. Any maternal thyroid gland abnormality or insufficiency can potentially influence the pregnancy outcomes for mother and fetus at all stages of pregnancy. Poor control of thyroid hormone is associated with miscarriages, pregnancy-induced hypertension, prematurity, low birth weight, intrauterine growth restriction, stillbirth, thyroid storm, and maternal congestive heart failure. More recent evidence also suggests that even very mild maternal hypothyroidism may result in intellectual deficiency in the offspring in later years [1]. Thus a close monitoring of the thyroid hormone levels and precise titration of the thyroid medications are essential to achieve desirable outcomes in women with thyroid abnormalities.

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Maternal hyperthyroidism, either pregestational or diagnosed during gestation presents a challenge to health care professionals. Graves disease is the commonest cause of hyperthyroidism during pregnancy. Hyperthyroidism during pregnancy will need to be managed with 4 to 5 weekly visits with monitoring of serum levels of free T4 and TSH. These levels will have norms that change with the stage of pregnancy. Poorly controlled or untreated hyperthyroidism can potentially develop into thyroid storm with high maternal and fetal mortality.

Drug treatment complications in pregnancy

Propylthiouracil (PTU) is recommended as the drug of choice in pregnancy [2]. However, a recent Cochrane review has found no randomised study on drug treatment of hyperthyroidism in pregnancy [3].

Although rare, the known complications of skin allergy, liver damage and the more serious agranulocytosis have all been reported with the use of PTU in pregnancy [4]. If there is skin allergy (usually a severe itch) or liver complications to PTU, then carbimazole should be used instead. If there is agranulocytosis, then oral medication should be stopped. Thyroidectomy is the treatment of choice, as radioiodine is contraindicated in pregnancy.

Thyroid storm

Thyroid storm during pregnancy is very rare, and may occur with untreated or inadequately treated thyrotoxicosis during pregnancy. It may be masked by the physiological erythema and tachycardia of pregnancy, and may manifest as cardiac failure, especially at parturition. The exact pathophysiology is not well understood, but the labor process induces high emotional and physical stress, and in some the need of a Caesarean section may exacerbate adrenergic activity [5,6]. Early recognition and initiation of appropriate therapy is important. There may be presence of high fever, disproportionate tachycardia and agitation or confusion. The diagnosis of thyroid storm is a clinical one, taking together the constellation of clinical symptoms and signs, and exclusion of infection and other causes. The elevated level of circulating thyroid hormone values is helpful but is not distinguishable from those seen in patients with uncomplicated hyperthyroidism. A scoring system using precise clinical criteria has been developed to facilitate the identification of thyroid storm [7].

The treatment of thyroid storm does not differ from non-pregnant women, and should be managed by a team consisting of an endocrinologist and maternal-fetal specialist in an intensive care unit. The management is directed at a rapid inhibition of thyroid hormone synthesis and its peripheral conversion, aggressive management of the systemic disturbances and identification and treatment of the precipitating cause [8]. Aggressive treatment of the cardiac failure is essential with diuretics. Glucocorticoids are also essential: dexamethasone, 8 mg/day can be administered and blocks the deiodination of T4 to T3 (while assisting also with fetal lung maturation). PTU is the preferred anti-thyroid medication as it can additionally block the peripheral conversion of thyroxine (T4) to tri-iodothyronine (T3). PTU can be administered orally, by nasogastric tube, and in the event that the oral route is contraindicated, rectally. PTU is given at a dose of 200–250 mg every 6 hours. Iodide can be administered 1 hour after PTU to inhibit the release of preformed thyroid hormone. Iodide can be given orally (Lugol's solution or saturated solution of potassium iodide, 4–8 drops every 6–8 hours; radiographic contrast media: iopanoic acid or sodium ipodate – 2 gm loading dose followed by 1 gm daily) or intravenously (sodium iodide 1 gm in 250–500 mL normal saline, infused twice daily).

Management of hyperpyrexia, treatment of precipitating factors and control of hyperadrenergic activity should be instituted simultaneously. Propranolol should be administered orally (40–80 mg every 6–8 hours) or intravenously (0.5–1 mg over 10 minutes, followed by 1–3 mg every few hours). The short-acting β_1-selective antagonist, esmolol can also be used intravenously (0.25–0.5 μg/kg loading dose, followed by an infusion of 0.05–0.1 μg/kg/min). The use of β-blocker is essential to survival from thyroid storm but need close monitoring. Plasma exchange has been tried in rare instances where aggressive conventional therapy fails to bring about discernible clinical improvement [9].

Careful monitoring of the fetus is also critical. However, prompt delivery of the fetus is currently not recommended during thyroid storm, unless indicated [10]. If the fetus is exposed to recent high-dose