International Journal of Advanced Research in Pharmacy and Education
Volume 1, Issue 1 - 2019, Pg. No. 22-24
Peer Reviewed & Open Access Journal

Article

The Ailments and Contraindications of Hyperthyroidism in Conceived Women - A Brief Review

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I N F O

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How to cite this article:
Pal N, Goswami S. The Ailments and Contraindications of Hyperthyroidism in Conceived Women - A Brief Review. *Int J Adv Res Pharm Edu* 2019; 1(1): 22-24.

Date of Submission: 2019-11-25
Date of Acceptance: 2019-12-15

A B S T R A C T

Hyperthyroidism or overactive thyroid is a medical condition where thyroid hormones produce excessively by thyroid gland. Hyperthyroidism and complications in pregnancy are correlated with each-other. Thyroid dysfunctions embroil pregnancy and make risk of maternal and fetal health. The list of complications during gestation period are premature delivery, pre-eclampsia, increased risk of habitual abortion, cardiac dysfunction, intrauterine fetal death, fetal congenital anomalies, fetal retardation, congenital hypothyroidism leading to increase the probability of maternal as well as perinatal morbidity and mortality. The present study represents a brief review on different complications and contraindications of hyperthyroidism during the gestation period of women and fetus. A web-based search *viz.* PUBMED, SPRINGER, ELSEVIER, GOOGLE scholar, RESEARCH GATE etc. and several research articles, review papers were used for making the review successful. The diagnosis of hyperthyroidism in conceived women is contraindicated due to the teratogenic effect of.[123] Thyroid scanning. Pregnant women with Grave's disease are at high risk of developing severe hyperthyroidism called as 'Thyroid Storm'. Grave's disease may be presented or initially exacerbated during the first trimester of pregnancy. Anti-thyroid drugs are referred to the patients in this respect. If these drugs are unsuccessful, then surgery is an alternative option. Radioiodine is also contraindicated to treat hyperthyroidism during pregnancy because it crosses the placenta and shows teratogenicity in fetus.

If the treatment is given to such patients delicately and follow all the guidelines for managing hyperthyroidism in conceived women, then we will surely able to conquer this condition in further upcoming days.

Keywords: Hyperthyroidism, Anti-Thyroid Drugs, Fetal Abnormality, Thyroid, Autoimmune Thyroid Disease, Congenital Anomalies, Grave's Disease

Introduction

Thyroid disease is the debilitation of the butterfly shaped thyroid gland at the base of the neck. Thyroid disease is categorized as Hyperthyroidism and Hypothyroidism where these endocrinology disorders are the clinical and biochemical syndromes resulting from increased and decrease thyroid hormone production reciprocally[1]. The present study represented a brief review on the different complications of hyperthyroidism in pregnant women.

Thyroid gland increases in size by 10% during pregnancy in iodine replete countries but by 20-40% in areas of iodine deficiency. Thyroid hormones, thyroxin (T_4) & triiodothyronine (T_3) productions enhance by nearly 50%, in conjunction with a separate 50% increase in the daily iodine requirements[2]. Hyperthyroidism in pregnancy affects the metabolism and lactation process describe in Figure 1.

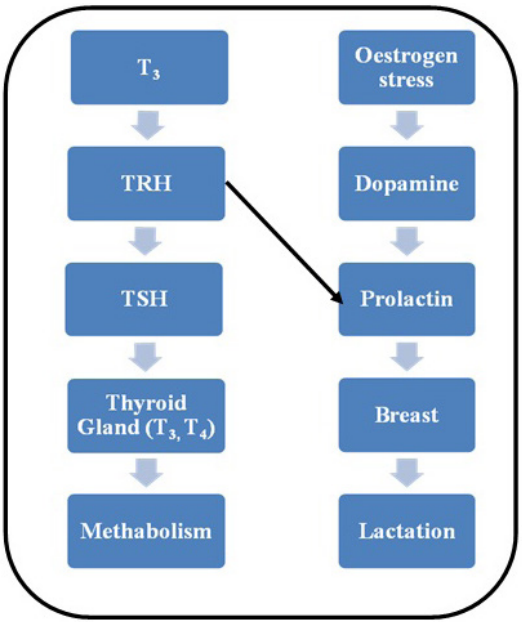

Figure 1.Thyroid hormones affect in metabolism and lactation[2]

The main aim of therapy is to keep the mother's free T_4 and T_3 levels in the high-normal range on the lowest dose of anti-thyroid medication[3]. Therapy should be closely monitored during pregnancy. This is typically done by following thyroid function tests[1] which is represented in Table 1.

Methods

The author had searched more than 10 research articles from different search engines and found the various complications including: habitual abortion[4] (recurrent pregnancy loss is occurred in 3 or more back-to-back pregnancy), premature delivery[5] (the parturation takes place before 37 weeks of gestational age), cardiac dysfunctioning, pre-eclampsia, intrauterine fetal death, fetal retardartion, fetal congenital anomalies, congenital hyperthyroidism resulting of increasing maternal morbidity, perinatal morbidity and mortality.[6]

Result & Discussion

List of complications of hyperthyroidism are tachycardia, palpitation, heat intolerance, goiter, weight loss, nervousness, anxiety, thyromegaly, exophthalmia, increase appetite, nausea, vomiting, sweating and tremor which are almost seen in pregnancy. But, the most discrimination features which are abnormal in pregnancy including: premature delivery, pre-eclampsia, increased risk of habitual abortion, cardiac dysfunction, intrauterine fetal death, fetal congenital anomalies, fetal retardation, congenital hypothyroidism[7]. Goiter may affect longer term fetal and child development[8]. The diagnosis of hyperthyroidism is also difficult during pregnancy due to ^{123}I thyroid scanning is contraindicated by the small amount of radioactivity and teratogenic because radioiodine cross the placental barrier[9]. Thionamide anti-thyroid drugs (Methimazole, Propythiouracil) are centerpiece in this respect.

Table 1.Thyroid Function Test results in different thyroid conditions[1]

Conditions	Normal	Hyper thyroidism
Total T_4	4.5-10.9mcg/dl	↑↑
Free T_4	0.8-2.7ng/dl	↑↑
Total T_3	60-181ng/dl	↑↑↑
T_3 Resin Uptake	22-34%	↑
Free thyroxin index	1-4.3units	↑↑↑
TSH	0.5-4.7 milliinternational units/l	↓↓

(↑ indicates increase, ↑↑ indicate increase more, ↑↑↑ indicate mostly increase, ↓ decrease more)

Thionamide antithyroid drugs, Propylthyouracil (PTU) dose starts with 50mg BID/TID and increase to 100 mg TID and the dose of Methimazole(MMI) begins with 5-10mg BID and increase to 10-40mg daily.[10] But, a Danish nationwide study divulged that 2-3%of children had grown up with birth defects due to PTU therapy.[11] Though surgical removal of thyroid gland is an alternative option, but it is unfamiliar to the pregnant women owing to the risks of both surgery and anesthasia[9]. Pregnant women with Grave's disease are at high risk of developing severe hyperthyroidism called as 'Thyroid Storm' which cause CNS effects (agitation, delirium, coma), Thermoregulatory dysfunction (fever), GI dysfunction, Cardiovascular problems (tachycardia, heart failure). β-blockers (propranolol) are recommended drugs to treat consequential palpitations and tremor due to hyperthyroidism in pregnancy. Perchlorate restrains the

active transport of iodide into the thyroid and then into the breast milk and used to treat hyperthyroidism.[12] Lithium has thyroid-restraining effects but it is teratogenic[13] and

Table 2.List of Complications[2]

S. No.	Complications
1.	Increased risk of abortion[4]
2.	Habitual abortion[4]
3.	Premature delivery[5]
4.	Cardiac dysfunction[6]
5.	Preeclampsia[6]
6.	Intrauterine fetal death[6]
7.	Fetal retardation[6]
8.	Fetal congenital anomalies[6]
9.	Congenital hypothyroidism[6]
10.	Goiter[8]

should not be useful in hyperthyroidism in pregnancy. All the complications are described in the Table 2.

Conclusion

The Research is going on to diminish the complications of hyperthyroidism in pregnancy in high level. Further interpretation focusing on the recent advancement in anti-thyroid medications along with artificially designed compounds can give rational therapy for pregnant women. While this study might not provide the definite scientific authentication of complications of maternal hyperthyroidism outcomes, the study only discuss about the complications in maternal hyperthyroidism which must be investigated further.

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