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CASE REPORT

Multigravida with Uncontrolled Hyperthyroid and Bilateral Pleural Effusion

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Abstract

***Background**: Hyperthyroid is a hypermetabolic condition caused by abnormal thyroid gland function resulting in overproduction and overexpression of thyroid hormone. The prevalence of hyperthyroid during pregnancy is 0.1-0.4%, where 85% of case are presented as grave's disease.*

***Objective**: To report the treatment of uncontrolled hyperthyroid during pregnancy.*

***Method**: Case Report*

***Case**: Ms. S, Female, 33 years old, presenting with brethlessness since 5 days before admission. Breathlessness persist and aggravated by lying down position. The patient has history of hyperthyroid since 1 years before admission. The blood pressure was 120/80 mmHg, respiration rate 28 times/min, and body temperature 36,7oC. Uterus fundal height 26 cm, cephalic presentation, fetal heart rate 130 times/min, single fetus intrauterine and alive. Laboratoric test for leukocyte: 21,300/ul, T4 level 22.8 mg/dl dan T3 level 2.9 mg/dl. The patient diagnosed with G3P2A0 31-week gestational age single alive fetus intrauterine with uncontrolled hyperthyroid and bilateral pleural effusion. Treatment consist of propylthiouracil as the drug of choice for anti-thyroidal drug, nifedipine for gestational hypertension and furosemide to treat the pleural effusion.*

***Conclusion**: History taking, physical examination, thyroid function test, and maintaining euthyroidism during pregnancy is a key to reduce the risk of maternal and fetal complication.*

***Keywords:** hyperthyroid, pregnancy , IUGR*

INTRODUCTION

During the early gestation, the fetus totally depending on maternal thyroid hormone. Maternal thyroid hormone bind to the receptors in the fetus brain cells, and converted intracellularly to support the fetal brain development.[1]

Hyperthyroid is a hypermetabolic condition caused by abnormal thyroid gland function resulting in overproduction and overexpression of thyroid hormone. The prevalence of hyperthyroid during pregnancy is 0.1-0.4%, and 85% of case presented as grave's disease.[2]

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Hypermetabolic symptom in maternal has similarities with hyperthyroid clinical symptom such as tachycardia, warm body, and heat intolerance. The abnormalities on the thyroid hormone test result are suppressed thyroid stimulating hormone (TSH) level and elevated tetraiodothyronine (T4) and/or triiodothyronine (T3) level. Hence, to diagnosing hyperthyroid during pregnancy requiring a good history taking, physical examination, and also thyroid function test result which indicating hyperthyroid.[3]

CASE REPORT

Reporting Ms. S, female, 33 years old, presenting with breathlessness which persist, aggravated by lying down position and accompanied with unproductive cough. The patient also complaining palpitation, tremor, and excessive sweating even in a cold temperature room. No sign of exophtalmus and weight loss. The patient still feels the fetal movement. The patient has a history of hyperthyroid disease since 1 year before admission. Physical examination result was compos mentis, blood pressure 120/80 mmHg, pulse 100 times/min, respiration rate 28 times/min, and body temperature 36.7ºC. Ausculation revealing a ronchi on both pulmonaries. The Wayne index score was 21. The abdominal examination palpation result: Leopold I: palpable soft mass not bouncy, Fetus Fundal Height: 26 cm. Leopold II: Fetal back at the maternal right side. Leopold III: Round mass, hard, bouncy in the lower abdomen, suggesting cephalic presentation. Leopold IV: Fetal head unengaged. His : (-). Auscultation : FHR : 130 times/min. USG finding was EFW 1680 gram and 31-week gestational age. Pada pemeriksaan leukosit: 21,300/ul, T4 22.8 mg/dl dan T3 2.9 mg/dl. Inspection : abdomen looks enlarged consistent with geastational age, striae gravidarum (+), linea mediana hyperpigmentation (+), The patients diagnosed with G3P2A0 31 week gestational age single alive fetus intrauterine with uncontrolled hyperthyroid and bilateral pleural effusion. The patient treated with propilthiouracil 2x100 mg as the drug of choice of antithyroid drug and furosemide to treat the pleural effusion.

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Table 1. Laboratoric Test Result

Hematologic Test	Result	Reference value	Unit
Hemoglobin	12.8	11-16	g/dl
Hematocrit	38.4	40-45	%
Leukocyte	21.3	4-11	thousand/ul
Thrombocyte	416	150-450	thousand/ul
Erythrocyte	4.26	4.5-6	mil/ul
HIV	Non-Reactive	Non-Reactive	-
HbsAg	(-) Negative	(-) Negative	-
Ureum	42.8	10-50	Mg/dl
Creatinine	0.8	0.6-1.1	Mg/dl
T3	2.9	High >2	Ng/ml
T4	22.8	High > 11.6	Ng/ml
TSH	0.5	Low <0.3	Ng/ml

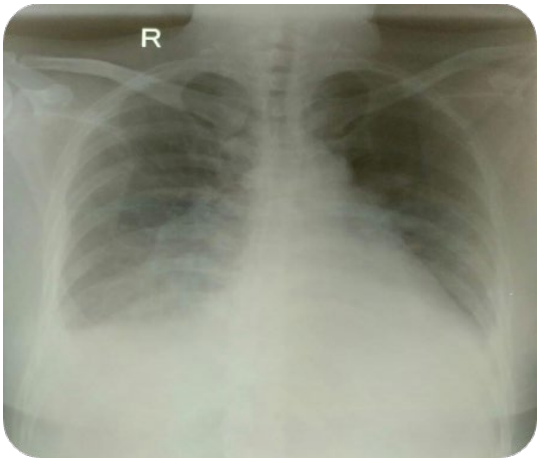

Figure 1. Chest X-ray Result

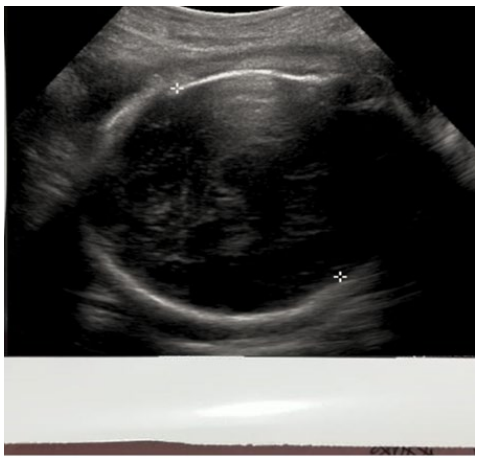

Figure 2. Fetal USG Result

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DISCUSSION

Thyroid hormone is an important homone during pregnancy. During the early gestation, fetus fully depending on maternal thyroid which passed through the placenta. This caused by fetus thyroid remain unfunctional until the 12-14 week of gestational age. This thyroid hormone will support the fetal brain development process. Even after the fetal produce the hormone themselves, the fetus still depends on the maternal thyroid hormone.[1] During pregnancy, thyroid hormone insult may occur such as hyperthyroidism. Hyperthyroidism is defined by abnormally high levels of thyroid hormone caused by an increased synthesis and secretion of thyroid hormone from the thyroid glan. Hyperthroid during pregnancy account for approximately 1-3% of all hyperthyroid case. The prevalence of hyperthyroid during pregnancy was 0.1-0.4%.[2,3]

Overt hyperthyroidism can be divided into different subtypes from the underlying etiology, and the three most common subtypes are Graves' disease, multinodular toxic goiter, and solitary toxic adenoma. Out of all, grave's disease is the most common presentation which accounted for 85% case.[2,4] Grave's disease is an autoimmune disease due to circulating autoantibody (Ab) which stimulate the thyroid stimulating hormone-receptor (TSH-R).[5,6]

The hypertiroid diagnosis usually made by clinical manifestation, using the Wayne Score. Wayne Score >19 indicating hyperthyroid and Wayne score <11 indicating not hyperthyroid. These tools can be used to diagnosing hyperthyroid during pregnancy since it has 86.9% sensitivity and 96.6% specificity.[7]

Note, to identify hyperthyroid during pregnancy symptom may be challenging as the pregnancy women has a similar hyperdynamic symptom with the hyperthyroid symptom such as palpitation, warm body, and heat intolerance. Furthermore, during normal pregnancy the thyroid binding globulin (TBG) level in the bloodstream elevated which stimulate the T3 and T4 to increasing respectively for fetal growth. This condition will complicate the diagnosis. Hence, the first thing to do is seek for hyperthyroid pathognomonic signs.[4]

Since 85% hyperthyroid during pregnancy is the grave's disease, the first clinical symptom to looking for is grave's ophtalmopathy and struma. If those patognomonic signs were negative, the investigation should be proceeded to fT4 and TSH tests to confirm the hyperthyroid diagnosis.[8] However, it takes a high cautious especially during the first trimester. At the first 12-week gestation, the hCG serum level will achive its maximal level which stimulate the thyroid gland to produce T4 hormone. In turn, the T4 hormone level would elevatde dan TSH level would suppresed. Therefore, it's important to test the TRAb and maternal T3. If there is an increasement of the hormone, the result will support the hyperthyroid diagnosis.[4,5]

Untreated hyperthyroid during pregnancy may increasing the risk of prematur delivery, intra uterine growth restricton (IUGR), low birth weight, pre-eklampsia, congestive heart

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failure, IUFD and thyroid crisis.[9] Thyroid crisis is an acute life threatening endocrine complication with a high mortality rate (20-30%).[10] In some case, the newborn has the hyperthyroidism sign, which lead to cardiology problem to psychomotoric disability.[2] Therefore there's a need to observe both maternal and fetus to prevent these complication.

The aim of hyperthyroid during pregnancy treatment is to control the thyroid function, to prevent the maternal and fetal adverse effect before, during, and after pregnancy. The treatment goal is to control the fT4 level in the normal value. There are 2 drugs of choice for a safe and effective anti-thyroid drug, propilthiouracil (PTU) and methimazole. Recommended dose for methimazol is 5–30 mg/day (mean 10–20 mg/day) and PTU is 100–600 mg/day (mean 200–400 mg/day). The American Thyroid Association recommending PTU as the first line therapy during <16 gestational week. The reason is methimazole therapy during <16 week has malformation risk twice than PTU. Methimazole can be prescribed after the 16-week gestational age with adjusted dose. The methimazole recommended dose during conversion into PTU was Metimazhole: PTU = 1:20 (ie, if during the <16-week gestation the patient takes PTU 100 mg daily, the methimazole dose would be 5 mg).[11]

Thyroid function test (TSH & T4) can be conducted every 1-2 week. Clinical improvement may be seen a couple week after treatment, and so the thyroid function will back to euthyroid 3-7-week post treatment. If the clinical sign improved and euthyroid status achieved, the clinical examination follow-up interval is every 2-4 week during the second and third trisemester.[4]

CONCLUSION

History taking, physical examination, history of previous pregnancies, and thyroid function test may help physician to diagnosis hyperthyroid during pregnancy. [3] Hyperthyroid treatment to maintain eutiroidism status during pregnancy and play an important role to reduce the risk of maternal and fetal complication. [11]

PTU prescription recommended during the first 16 week.[2] Methimazole could be prescribed after 16-week gestational age. Recommended dose of methimazole during therapy conversion from PTU to methimazole is metimazhole: PTU = 1:20.[11]

Thyroid function test (TSH & fT4) and other clinical examination can be repeated every 1-2 week. If the clinical sign improved and euthyroid status achieved, the clinical examination follow-up interval is every 2-4 week during the second and third trisemester.[4]

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