Thyroid Storm in Post-Partum in Bangkalan Hospital: A Case Report

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Abstract

Thyroid crisis is a rare complication of hyperthyroidism, with a greater risk about 10 times during pregnancy, also clinical manifestations and significant increasing of level of thyroxine (T4) and tri-iodothyronine (T3). Thyroid crisis could cause mortality in >10%. A 58-year-old female was referred from Bangkalan Hospital, presented with palpitation, shortness of breath, diarrhea 2-3×/day, vaginal bleeding, fever for 1 day before admittance. Hyperthyroid for 3 years ago and routinely consumed thyrozol (1×2tab) in 2 years but did not take the medicine for 1 year ago. Physical examination: BP 147/100 mmHg, pulse rate 124×/minute, temperature 38.4 ºC, RR 30/minute, conjunctiva anemia, thyroid palpable, exopthalmus. ECG results: presence of sinus tachycardia, Chest X-Ray: cardiomegaly. Burch Wartofsky Score obtained a total score of 45, (temperature 38.5 C=15, diarrhea=10, tachycardia=15, CHF=5). Laboratory results: TSH <0.004 IU/mL, FT4 5.31 ng/dl. Thyroid crisis is a rare case of hyperthyroidism, a greater risk during pregnancy which could lead to death. Many symptoms arise in hyperthyroidism which could lead to thyroid crisis. The criteria which used to assess thyroid analysis is the Burch Wartofsky Score, FT4 levels increased 5.31 ng/dl. This patient was diagnosed as thyroid storm in post-partum, based on Burch Wartofsky Score, low TSH level and an elevated FT4 level and not taking medicine for 1 year ago.

Keywords: *Thyroid storm, maternal hyperthyroidism, thyroid function, hyperthyroid.*

Introduction

Thyroid crisis is a rare complication of hyperthyroidism, with a 10 times greater risk of occurring during pregnancy[1]. The term "storm" describes the intensity of clinical manifestations and the significant increase in levels of thyroxine (T4) and tri-iodothyronine (T3)[2,3]. The incidence of hyperthyroidism during pregnancy is relatively rare and usually treated medically with the drug thioamide. One of the most dreaded symptoms of hyperthyroidism is thyroid crisis/thyroid storm, with a mortality rate of >10%[1,2,4,5]. In the United States survey, the incidence of thyroid storm ranged from 0.57 to 0.76 cases per 100,000 per year in the normal population. According to the Japanese National Survey, the incidence of thyroid storm is 0.2 per 100,000 population per year, approximately 0.22% of all thyrotoxicosis patients and 5.4% of hospitalized thyrotoxicosis patients.[3] Poor control of hyperthyroidism during pregnancy is associated with number of problems, including Intrauterine Fetal Death (IUFD), hypertension in pregnancy, preterm birth, low birth weight, intrauterine growth restriction and maternal congestive heart failure[6]. Diagnosing a thyroid crisis is not easy, therefore an approach is needed to expedite a thyroid crisis diagnose by using the Burch-Wartofsky Point Scale with a value of ≥45 to diagnose a thyroid crisis. The principles of management of thyroid crisis in pregnancy reduce the synthesis and secretion of thyroid hormones, decrease the peripheral effects of thyroid hormones, inhibit the conversion of T4 to T3, therapy to prevent systemic decompensation, therapy of precipitating diseases, pregnancy management and supportive therapy[7,8,9,10].

Case

Patient Mrs. H, 25 years, referral from Bangkalan Hospital, 7 hours post-partum, came with complaints of palpitations, shortness of breath (+) and diarhea 2-3 times/day and fever for 1 day before admittance to the hospital, as well as vaginal bleeding (+). The patient suffered from hyperthyroidism for 3 years, had routine treatment for 2 years, and the last 1 year did not take PTU drugs. Physical examination: Blood pressure: 147/100, pulse 124×/m, temperature 38.5C, RR 30×/m, anemia, palpable enlargement of the thyroid, exopthalmus with a stell wag's sign (+). ECG results: sinus tachycardia, chest X-ray results: cardiomegaly. The Burch Wartofsky Score got a total score of 45, (temperature 38.5 °C=15, diarrhea=10, tachycardia=15, CHF=5). Laboratory results TSH values <0.004uIU/mL, FT4 5.31 ng/dl.

Table 1. Results of Clinical Chemistry Laboratory Tests.

	25/12/19	Normal Value
K (mmol/L)	4.3	3.5-5.1 mmol/L
Na (mmol/L)	141	136-145 mmol/L
Cl (mmol/L)	110	98-107 mm0l/L
BUN (mg/dL)	10	mg/dL
SCr (mg/dL)	0.83	mg/dL
Alb (g/dL)	2.1	g/dL
AST (U/L)	62	U/L
ALT (U/L)	18	U/L
Calcium	6.8	mg/dL

Table 2. Blood Gas Analysis Table.

	25/12/19	**26/12/19**	**Normal Value**
pH	7.35	7.29	7.35-7.45
pCO2 (mmHg)	16.0	14	35-45
pO2	134	123	80-100
HCO3(mmol/L)	8.8	6.7	22-26.
BaseExcess (mmol/L)	-16.8	-19.9	Mmol/L
SO2%	99	98	%
Aado2	-4	123	mmHhg

Table 3. Immunological Results.

	25/12/19	Normal Value
FT4	5.31	0.9-1.76 ng/dl
T3 Total	2.05	0.6-1.81 ng/dl
TSH	<0.004	2<12th:0.64- 6.27uIu/mL 12-<18th:51-4.94 >18 th: 0.55-4.78
TIBC	380	250-450 ug/dl
Serum Iron	29	35-150 ug/dl

Table 4. Results of the Laboratory of Hematology at Dr. Soetomo General Hospital, Surabaya.

	25/12/19	26/12/19	Normal Value
Hb (g/dL)	7.4	6.9	13.3-16.6
RBC (106/µl)	2.94	2.71	3.69-5.46
Hct (%)	22.2	21.3	41.3-52.1
MCV (fl)	75.5	78.6	86.7-102.3
MCH (pg)	25.2	25.5	27.1-32.4
MCHC (g/L)	33.3	32.4	29.7-33.1
RDW (%)	16.7	16.6	12.2-14.8
WBC (103/µl)	13.05	17.03	3.37-10
% Eo	0.2	0.0	0.6-5.4
% Ba	0.2	0.2	0.3-1.4
% Neu	81.9	84.3	39.8-70.5
% Ly	15.6	13.4	23.1-49.9
% Mo	2.1	2.2	4.3-10
Plt (103/µl)	90	121	150-450

Table 5. Results of Urinalysis.

	25/12/19	Normal Value
Glucose	Negative	Negative
Bilirubin	2.05	Negative
Keton	< 0.004	Negative
Weight	1.010	1.030-1.030/dl
Blood	1+	Negative
pH	5.50	4.5- 8.0
Protein	1+	Negative
Urobilinogen	0,2	< 0.1 mmol/L
Nitrit	+/-	-
Colour	Yellow	
Clarity	Clear	

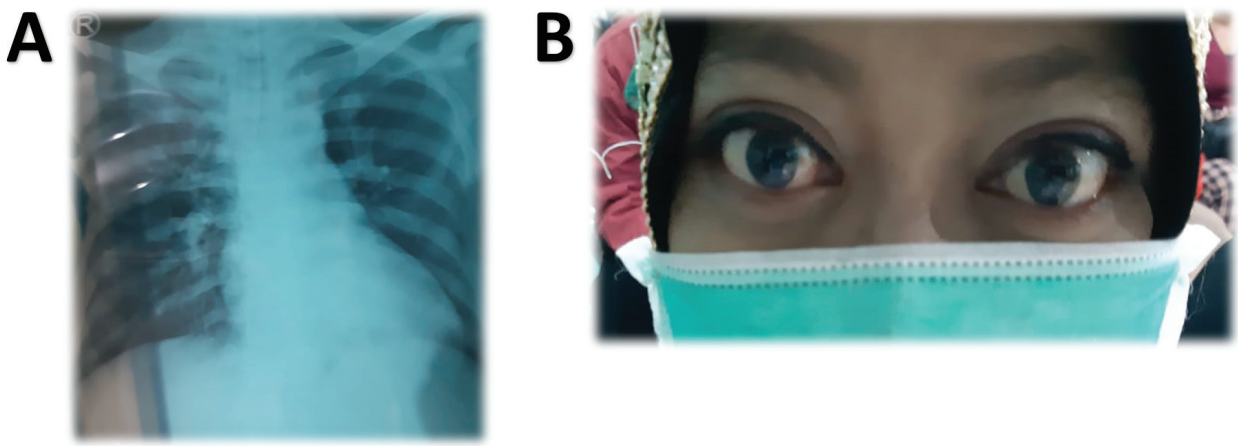

Figure 1. A. AP chest X-ray results. B. Exopthalmus.

Cor: Big and enlarged impression shape.

Pulmo: invisible infiltrate.

Trachea in the middle.

The right and left phenicocostalis sinus is sharp.

Right and left hemidiaphragm looks good.

The bones look good.

There was no visible soft tissue abnormality.

Impression: Cardiomegaly.

Pulmo did not appear abnormal.

Discussion

Thyroid crisis is a rare complication of hyperthyroidism, with a 10 times greater risk of occurring during pregnancy. Patients with hyperthyroidism during pregnancy with poor control could precipitate a thyroid crisis.[1] In this case, there was poor control during pregnancy where patient stopped taking the drug for a year. The patient was referred from Bangkalan Hospital, 7 hours after post-partum, with complaints of palpitations, shortness of breath, and diarrhea 2-3 times a day for 1 day before admittance to the hospital, vaginal bleeding and fever was also complained of. Theoretically, pregnancy will cause an increase in Thyroid Binding Globulin (TBG) levels which result in an increase in total T4 and T3.[5] Pregnancy could worsen the state of hypetiroidism, resulting in various symptoms. Clinical symptoms which arise such as fever, tachycardia, heart failure, decreased consciousness, seizures, gastrointestinal disorders.[2,4,6] The patient had a 3-year history of taking the drug and stopped taking the drug for the last 1 year. There were clinical symptoms of fever, diarrhea, tachycardia, rapid breathing and shortness of breath, therefore the patient was referred to the hospital. Cardiomegaly was found on the chest X-ray and to diagnose a thyroid crisis is not easy using the Burch-Wartofsky Point Scale (Table 6).

Table 6. Burch-Wartofsky Point Scale for Diagnosing Thyroid Crisis.

Criteria	Points
Thermoregulation disorders Temperature (°C)	
37.2–37.7	5
37.8–38.3	10
38.4–38.8	15
38.9–39.3	20
39.4–39.9	25
≥ 40.0	30
Cardiovascular Tachycardia per minute	
90–109	5
110–119	10
120–129	15
130–139	20
≥ 140	25
Atrial Fibrillation Absent Present	 0 10
Congestive heart failure Absent Mild Moderate Severe	 0 5 10 15
Gastrointestinal-hepatic disorders Symptoms	
Absent	0
Moderate (diarrhea, abdominal pain, nausea/vomiting)	10

Severe (jaundice)	20
Central nervous system disturbance	
Absent	0
Mild (agitation)	10
Moderate (delirium, psychosis, extreme lethargy)	20
Severe (seizure, come)	30
Precipitating event	
Absent	0
present	10
Total score ≥ 45 25–44 < 25	 Thyroid storm Impending storm Storm unlikely

Through this patient's case was found a Burch Wartofsky Score 45, fever with a temperature of 38.50C=15, diarrhea=10, tachycardia=15, CHF=5, where with a score of ≥45 a thyroid crisis was concluded. Patients who are suspected to have a thyroid crisis based on criteria should be treated intensively. The flow of thyroid crisis management is according to the Japan thyroid storm guidelines (Figure 1). Patients with a history of medication and stopping medication are more likely to develop a thyroid crisis. Patients were evaluated for A, B, C, D, E, treatment and referred to the thyroid crisis diagnosis algorithm. Laboratory results TSH value <0.004uIU/mL, FT4 5.31 ng/dl, anemia, also low albumin in the presence of laboratory results which support a thyroid crisis[2,4,5,6]. When patients are diagnosed by thyroid crisis should be suggested with PTU 600 mg/day[4,7,8].

Conclusion

Thyroid crisis is an emergency characterized by acute hypermetabolic rapid deterioration of a life-threatening condition. Early suspicion, prompt to diagnosis and intensive treatment which will improve survival in patients with thyroid crisis. The diagnosis criteria for thyroid crisis using the Burch Wartofsky Score, this patient obtained a score of ≥45 and with a history of stopping taking PTU drugs for 1 year.

Conflict of Interest: The author declare that they have no conflict of interest.

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Ethical Approval

This study approved by the Faculty of Medicine, Airlangga University - Dr. Soetomo General Hospital, Surabaya, Indonesia.

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