

## Case Report



# A Pregnant Lady with Thyrotoxic Cardiomyopathy and Pulmonary Hypertension

Zahidul Mostafa<sup>1</sup>, Mohammad Yunus<sup>2</sup>, Arin Barua<sup>3</sup>, Najnin Akhter<sup>4</sup>,  
MSI Tipu Chowdhury<sup>5</sup>.

### Abstract

*Thyrotoxic cardiomyopathy is potentially life threatening complications of thyrotoxicosis during pregnancy due to its harmful effects both on mother and fetus. We present a case of 32-year-old pregnant lady presented with non-productive cough, palpitation, restlessness, sweating and weakness after minimum exertion with a small swelling on the right side of her neck for three months. There was tachycardia with normal blood pressure, first and second heart sound were soft with pansystolic murmur on mitral and tricuspid area. After all laboratory investigations, she was diagnosed as dilated cardiomyopathy with moderate to severe pulmonary hypertension with toxic multi nodular goiter with 13 weeks of pregnancy. The thyrotoxic cardiomyopathy during pregnancy is rare due to difficulties in diagnosis. However, physicians should be aware of the risk posed by thyrotoxic cardiomyopathy during pregnancy.*

**Keywords:** Thyrotoxicosis, Cardiomyopathy, Pulmonary Hypertension.

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### Introduction

Thyrotoxicosis is a common clinical condition during pregnancy which may have particular challenges due to the normal physiologic changes that occurred and also for limitations of laboratory and radiologic testing during pregnancy.<sup>1</sup> Thyrotoxic cardiomyopathy (TCMP) is defined as the myocardial damage caused by the toxic effect of abundant thyroid hormones (TH). The ultimate effects result in altered energy production by myocytes (oxidative phosphorylation and glycolysis), intracellular metabolism (protein synthesis) and myofibril contractile functions.<sup>2</sup> TCMP is manifested by the left ventricular hypertrophy (LVH), arrhythmias (usually atrial fibrillation), dilation of the heart chambers and heart failure, pulmonary hypertension and diastolic dysfunction and if it left untreated then rarely causes heart failure in otherwise healthy patients.<sup>2</sup> A tachycardia mediated mechanism leading to an increased level of cytosolic calcium during diastole with reduced ventricular contractility and diastolic dysfunction, often with tricuspid regurgitation (TR) results heart failure.<sup>3</sup>

The cardiac symptoms and pathophysiologic impairment in thyrotoxic heart disease may be due to over activity of the thyroid gland usually due to excessive sympathetic stimulation.<sup>2</sup> Thyrotoxic heart disease is a potentially treatable cause of morbidity and mortality.<sup>4</sup> About 33% patients with hyperthyroidism have cardiac symptoms and among them about 57% had preexisting ischaemia, hypertensive or valvular heart disease.<sup>2</sup> Long-term follow-up confirmed that thyrotoxic cardiac dysfunction is reversible with successful antithyroid therapy.<sup>4</sup> Though cardiac failure due to hyperthyroidism is a rarity but it weaken the cardiac functions and harmful to the fetus. So its early diagnosis as well as treatment are important to rescue both the mother and fetus.<sup>5</sup>

### Case Report

A 32-year-old non-smoker and non-alcoholic pregnant woman (Figure: 1), para- 4+2, 7<sup>th</sup> gravida from Maheshkhali, Cox's Bazar got admitted into the Cox's Bazar Medical College Hospital on 29<sup>th</sup> December, 2019 with the complaints of cough

1. Assistant Professor, Department of Cardiology, Cox's Bazar Medical College, Cox's Bazar, Bangladesh.

2. Assistant Professor, Department of Medicine, Cox's Bazar Medical College, Cox's Bazar, Bangladesh.

3. Intern Doctor, Cox's Bazar Medical College Hospital, Cox's Bazar, Bangladesh.

4. Assistant Professor, Department of Anatomy, Brahmanbaria Medical College, Brahmanbaria, Bangladesh.

5. Consultant, Department of Cardiology, Cox's Bazar Medical College Hospital, Cox's Bazar, Bangladesh.

**Correspondent:** Dr. MSI Tipu Chowdhury, Consultant, Department of Cardiology, Cox's, Bazar Medical College Hospital, Cox's Bazar, Bangladesh. Mobile: 01759198098, email: dr.tipuchowdhury@gmail.com

for one month and palpitation, sweating with restlessness for 20 days. She had no history of hypertension and diabetes and belonged to a low socio-economic family. She was amenorrhoeic for 13 weeks. She had non-productive cough consequently felt restless, palpitation and sweating. She also noticed weakness after minimum exertion like combing hair, taking off clothes etc. She noticed a small swelling on the right side of her neck for 3 months which was asymptomatic. She had no history of taking any medication regularly and not immunized as per EPI schedule.

She was a regularly menstruating woman with regular flow and duration and had history of using oral contraceptive as well as injectable contraceptives after her third pregnancy. She also had history of an induced abortion 5 years ago and a miscarriage one year back.

On admission, she was not-anemic, non-icteric with a blood pressure (BP) of 100/75 mm Hg, pulse was 110 bpm and regular, first and second heart sound were soft with pansystolic murmur on mitral and tricuspid area. On her regular follow up examination, she had tachycardia and BP was within normal range.

Her routine investigation reports revealed that hemoglobin was 12.2 g/dl, urine R/M/E was normal, Random Blood Sugar was 6.1mmol/L. Chest X-ray exhibited bilateral inflammatory lung lesion (Figure: 2) with cardiomegaly and ECG showed sinus tachycardia (Figure:3). Ultrasonography (USG) of the pregnancy profile confirmed early pregnancy of 12 weeks (Figure: 4) and USG of neck revealed few nodules in right lobe of the thyroid (Figure:5). Her Serum TSH level was 0.10 mIU/L, FT3 was 11.14 pmol/L and FT4 was 30.84 pmol/L. Echocardiography showed dilated cardiomyopathy (LVIDd-63 mm) (Figure:6), mild left ventricular (LV) systolic dysfunction (LEFT-48%), severe mitral regurgitation (MR), moderate TR with moderate to severe pulmonary hypertension (Calculated PASP- 70 mmHg), good right ventricular (RV) function, mild pericardial effusion. After considering all reports a diagnosis of dilated cardiomyopathy with moderate to severe pulmonary hypertension with toxic multinodular goiter with 13 weeks of pregnancy was confirmed.

On reviewing her reports the following treatment was suggested, complete bed rest with oxygen inhalation, Inj. Ceftriaxone 1gm twice daily, Inj. Furosemide 40 mg once daily, Aspirin 75mg once daily, Propranolol 10 mg twice daily. Finally patient was referred to the Chittagong Medical College Hospital for better management where therapeutic abortion was done after admission and anti-thyroid medications was started.



Figure 1: Swelling over anterior aspect of neck.

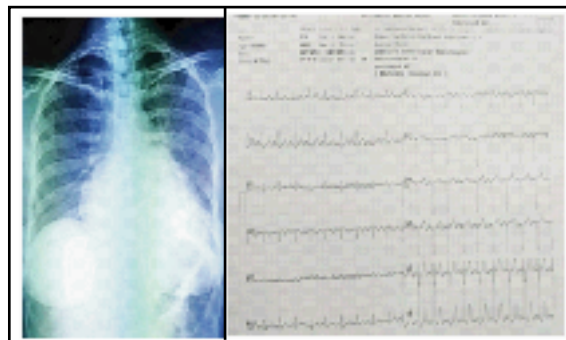


Figure 2 & 3: Chest X-ray (P/A-view) Showed bilateral inflammatory lung lesion, ECG- Showed sinus tachycardia.



Figure 4: USG Showing 12 weeks of pregnancy.



Figure 5: USG neck revealed few nodules in right lobe of thyroid gland.

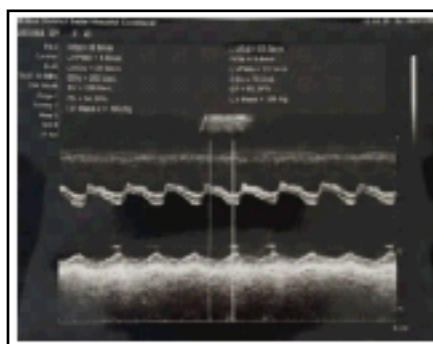


Figure 6: Echocardiography showed features of dilated cardiomyopathy.

## Discussion

Among the thyrotoxic individuals only 6% develops the symptoms of the heart failure and fortunately less than 1% develops dilated cardiomyopathy with impaired left ventricular systolic function.<sup>3</sup> The gestational transient thyrotoxicosis (GTT) is the most common cause of thyrotoxicosis in pregnancy that occurs from the stimulatory action of human chorionic gonadotropin (HCG) on the TSH receptor. The prevalence of GTT is variable, about 2-3% in European population, 11% in Singapore and 0.2 to 0.7% in US population.<sup>1</sup> In Nigeria, among endocrine disorder with diverse metabolic sequelae, thyroid disorder remains the most common. A range of diseases are included in the thyrotoxic heart disease like sinus tachycardia, systemic hypertension, arrhythmia or cardiomyopathy, dilated cardiomyopathy being the most reported in thyrotoxic.<sup>2</sup>

Our case had thyrotoxic heart disease, dilated cardiomyopathy with moderate to severe pulmonary HTN with toxic multinodular goiter at a younger age and she also belonged to lower socio-economic background. One of the important factors for diagnosis and management of thyrotoxic heart disease is low socio-economic condition.<sup>2</sup> There are many causes of thyrotoxicosis in pregnancy such as eclampsia, pre-eclampsia, renovascular diseases, pheochromocytoma, primary aldosteronism, oral contraceptives, hypo and hyperthyroidism etc.<sup>4</sup> Our case had a history of using oral as well as injectable contraceptives over a period of 2 years. Excess of thyroid hormones has a direct effect on the cardiac myocytes and peripheral vascular system resulting in the development of various cardiovascular complications like elevated resting heart rate, supraventricular premature contractions, atrial fibrillation, cardiac hypertrophy, arterial hypertension, thyrotoxic cardiomyopathy, congestive heart failure.<sup>6</sup>

## Conclusion

Although diagnosis of endocrine disorders during pregnancy is difficult but we should be aware of the dreadful complications of the thyrotoxic heart diseases during pregnancy.

## Acknowledgement

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