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Research Article

**CARDIAC MANIFESTATIONS IN PATIENTS WITH  
HYPERTHYROIDISM****Dr. Syed Fasih Ahmed Hashmi\*<sup>1</sup>, Dr. Mashooq Ali Dasti<sup>1</sup>, Dr. Zulfiqar Ali Qutrio Baloch<sup>2</sup>  
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Jamshoro.<sup>2</sup>Brandon Regional Hospital, Brandon, Florida.<sup>3</sup>Zulekha Hospital, Dubai United Arab Emirates.**Received:** 26 February 2016**Accepted:** 08 March 2017**Published:** 14 March 2017**Abstract:****OBJECTIVE:** To evaluate the cardiac manifestation in patients with hyperthyroidism.**PATIENTS AND METHODS:** This descriptive study was conducted from January 2015 to June 2015 on subjects with clinical manifestation of hyperthyroidism. The inclusion criteria of the study were patients, of  $\geq 12$  years of age, either gender with hyperthyroidism. The subjects were further evaluated for cardiac manifestations by advising X-ray chest, ECG and echocardiography. The frequency / percentages (%) and means  $\pm$ SD computed for study variables.**RESULTS:** Total fifty patients of hyperthyroidism were identified to have cardiac manifestations and were evaluated and enrolled in the study. The mean  $\pm$ SD for whole population was  $48.87 \pm 5.86$  while the mean free T3, T4 and TSH was  $720.87 \pm 10.96$  pg/d,  $4.98 \pm 1.84$  ng/dl and  $0.23 \pm 1.20$ . The male population was predominant (60%) while the common symptoms observed were palpitation, dyspnoea, chest pain and tachycardia. The ECG, echocardiograph and chest X-ray was abnormal in 41(82%), 23(46%) and 18(36%). The ECG findings were sinus tachycardia, LVH and atrial fibrillation while the echocardiographic findings were chamber enlargement, MR and AR where as X-ray shown cardiomegaly.**CONCLUSION:** The patients of hyperthyroidisms should be carefully evaluated as early detection and appropriate treatment is a best strategy to reduce cardiovascular complications associated with hyperthyroidism**Keywords:** Hyperthyroidism, Thyrotoxicosis and Cardiac complications.**Corresponding Author:****Dr. Syed Fasih Ahmed Hashmi\*,**

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**INTRODUCTION:**

Hyperthyroidism is the cause of fatal arrhythmia and thromboembolic phenomenon is also more prevalent in patients with atrial fibrillation due to hyperthyroidism[1,2]. The management of hyperthyroidism includes antithyroid medications along with restoration of sinus rhythm[3,4]. The thyroid hormone can directly have effect on the cardiovascular system by increasing myocardial inotropic effect and heart rate and peripheral vascular dilatation to increase cardiac output[5]. The arrhythmias (atrial arrhythmias), exercise intolerance, and heart failure are observed in hyperthyroidism[6,7]. The common causes are Graves' disease, toxic adenomas and toxic multinodular goiter, the effect of thyroid hormone on heart and vascular function was also reported previously[8]. The hyperthyroidism causes tachycardia, wide pulse pressure and increases in cardiac output leads to heart failure or worsening of ischemic heart disease or angina pectoris [9]. Supraventricular arrhythmias account for cerebrovascular mortality because atrial fibrillation leads to embolic phenomena. Therefore, measuring of TSH is an important step as far as cardiac complications are concerned[10]. Majority of cardiac abnormalities back to normalize once euthyroid state has been gained, although persistent atrial fibrillation is also reported while the specific therapy antithyroid therapy along with beta blockers and anticoagulation medication (in elderly or patients with AF)[11, 12]. This study was conducted to evaluate the cardiac

manifestations of patients with hyperthyroidism as early evaluation can prevent the patient to acquire life threatening arrhythmias due to thyrotoxicosis.

**PATIENTS AND METHODS:**

This descriptive study was conducted from January 2015 to June 2015 on subjects with clinical manifestation of hyperthyroidism. The inclusion criteria of the study were patients, of  $\geq 12$  years of age, either gender with hyperthyroidism while the exclusion criteria were patients already on anti-thyroid medication, hypothyroidism, malignancy, ischemic heart disease, cardiomyopathy and connective tissue disorders. All the patients had detail history, clinical examination (especially blood pressure and pulse) and routine and specific investigations includes, serum TSH, free T3, T4, electrocardiography and echocardiography. The informed consent was taken from every relevant patient and the data was recorded on pre-designed proforma. The SPSS 16 software was used to analyze the data and frequency and percentages was calculated.

**RESULTS:**

Total fifty patients of hyperthyroidism were identified to have cardiac manifestations and were evaluated and enrolled in the study. The mean  $\pm$ SD for whole population was  $48.87 \pm 5.86$  while the mean free T3, T4 and TSH was  $720.87 \pm 10.96$  pg/d,  $4.98 \pm 1.84$  ng/dl and  $0.23 \pm 1.20$ . The results are presented in Table 1-2.

**Table 1: The Demographical and Clinical Presentation of Population**

AGE (yrs)	FREQUENCY (N=50)	PERCENTAGES (%)
12-19	2	4
20-29	06	12
30-39	10	20
40-49	12	24
50+	20	40
<b>GENDER</b>		
Male	30	60
Female	20	40
<b>CLINICAL FEATURES</b>		
Palpitation	32	64
Dyspnoea	24	48
Chest pain	17	34
Wide pulse pressure	18	36
Tachycardia	29	58

Table 2: The Electrocardiographic, Echocardiographic and Imaging Distribution

ELECTROCARDIOGRAPHY	N=41	PERCENTAGE (%)
Sinus tachycardia	23	56
Left ventricular hypertrophy	06	14.6
Non specific ST-T changes	04	9.7
Atrial fibrillation	08	19.5
<b>ECHOCARDIOGRAPHY</b>		
N =23		
Enlargement of chamber	10	43.4
Mitral valve prolapse	4	17.3
Mitral regurgitation	6	26
Aortic regurgitation	3	13
<b>CARDIOMEGALY (X-ray)</b>		
N=50		
Yes	18	36
No	32	64

**DISCUSSION:**

In present study the mean age  $\pm$ SD for whole population was 48.87+5.52 years. Majority were 40-50 years of age consistent with the study by Grais IM, et al [13]. In present study the male gender was predominant (60%), the gender is also consistent with former literature [14]. In present study the clinical features observed were palpitation (64%), followed by dyspnoea (48%) and tachycardia (58%). The clinical features are consistent to former study [15]. In present study palpitation, cardiomyopathy, heart failure, tachycardia and atrial fibrillation are features found in the elderly population comparable with the Zargar AH, et al and Klein I, et al studies [16, 17]. In Klein I, et al [17] study 30% subjects had wide pulse while in present study it was reported as 36%. The difference among the percentage for wide pulse pressure might be because of the short duration illness of present study population. In current series, 08 patients had atrial fibrillation comparable to the Zargar et al (63.5%) [16], left ventricular hypertrophy, non specific ST-T changes and cardiomegaly was observed in 06, 04 and 18 individuals while it is 5.4%, 9.8% and 14% in the study by Zargar et al [16]. In present study the majority of population (72%) from rural areas and the observation was also reported by Hill AG, et al [18]. In the study by Klein I, et al sinus tachycardia (74%) atrial fibrillation (12.5%), heart failure (3.6%) while

in the study by Gupta S, et al tachycardia (74%), left ventricular hypertrophy (14.6%) and heart failure (3.6%) was observed in patients with hyperthyroidism [19].

**CONCLUSION:**

Hyperthyroidism associated with cardiac manifestation (palpitation, chest pain and dyspnoea) while the ECG changes includes tachycardia, left ventricular hypertrophy and atrial fibrillation whereas echocardiogram detect chamber hypertrophy, mitral regurgitation and valve prolapsed and aortic regurgitation and chest X-ray shown cardiomegaly. Thus, the patients of hyperthyroidism should be carefully evaluated as early detection and appropriate treatment is a best strategy to reduce cardiovascular mortality and morbidity.

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