

## TO STUDY THE INCIDENCES OF CARDIAC MANIFESTATION IN THYROID DISORDER (HYPO & HYPER) BOTH IN RURAL AREA OF MALWA REGION

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### Abstract

**Background:** In this study 100 cases of thyroid dysfunction were studied for the cardiovascular manifestations. Out of these, 60 cases were of hypothyroidism and 40 cases were of hyperthyroidism.

There was no age bar for inclusion in the study. All of these cases were selected from those attending the Endocrinology OPD in IMCHRC hospital, Indore.

**Result:** Low pulse pressure is the commonest cardiovascular finding in hypothyroidism (68.33%) followed by diastolic hypertension (55%), soft heart murmur (31.66%), sinus bradycardia (30%) and pericardial effusion (20%) Pulse pressure >40 mm of Hg is the commonest finding in hyperthyroidism. Almost all patients of hyperthyroidism have sinus tachycardia.

**Conclusion:** Study of cardiac signs and symptoms in patient with hyperthyroidism revealed 87.5% prevalence of pulse pressure > 40 mm hg, 85% prevalence of loud heart sound, 82.5% cases of sinus tachycardia, 52.5% cases of hyperdynamic precordium, 47.5% cases of ejection systolic murmur, 42.5% cases of prolonged Qt interval, 25% cases of precordial thrill, 47.5% patients with systolic BP>160 mm Hg, 20 5 cases with mid systolic click, 27.5% patients with LVH , 15% cases with ST-T changes, 5% cases with S3 and 10% patients with atrial fibrillation.

**Keywords:** Cardiac, Manifestation, Thyroid, Hyperthyroidism & Hypothyroidism.

### Introduction:

Thyroid Hormone is like rainfall as excess as well paucity of which will affect body metabolism. If affect cardiovascular system and central nervous system along with other system.<sup>1</sup>

The thyroid glands develops forms the floor of the primitive pharynx during the transcription factor stimulate thyroid cell development and induction of thyroid specific gene hormones such as thyroglobulin, thyroperoxidase, thyro stimulating hormone receptor gene.<sup>2</sup>

Thyroid gland slowly forms the protein thyroglobulin, some tyrosine residue of which become iodinated to constitute the active thyroid hormone thyroxine (T4) and triiodotyrosine (T3) which are partially kept in reserve and released into the circulation as per required.<sup>3</sup>

There are multiple systems on which Thyroid hormones act or hormones is supplementary to their functions .one of the most important among them is the cardiac function. The cardiovascular manifestation of hyperthyroidism as well as

hypothyroidism are quite dramatic and are under investigation since 20<sup>th</sup> century.<sup>4</sup>

### Material & Method

It is cross sectional, observational and descriptive study for the assessment of cardiovascular manifestations in patients of thyroid disorder. Study started from 2015 December completed on 2017 January.

In this study 100 cases of thyroid dysfunction were studied for the cardiovascular manifestations. Out of these, 60 cases were of hypothyroidism and 40 cases were of hyperthyroidism.

There was no age bar for inclusion in the study. All of these cases were selected from those attending the Endocrinology OPD in IMCHRC hospital, Indore. Complete evaluation was done of each patient according to the Performa prepared to facilitate a systematic study in all cases. Investigation like ECG, Chest X-Rays, 2 D-ECHO done.

### Inclusion Criteria

Following criteria were used for selection of the patients.

1. Age: Patients from all age groups were included in this study.
2. Sex: Patients of both sexes were studied.
3. Therapy: Only fresh cases were selected. Also those who had admitted treatment for more than 6 months were included.
4. All types of thyroid disorder were included except those which are included in exclusion criteria.
5. Population: Indian patients from all socio - economical class, casts, and from rural and urban areas were studied.

#### Exclusion Criteria

1. Seriously ill patient.
2. Patients with multi-system diseases or cancer.
3. Drug induced thyroid disorder.
4. Patients with sick Euthyroid syndrome.
5. Pregnant women.
6. Patients who are suffering from active renal and liver diseases.
7. Patients suffering from acute psychiatric illness.

On clinical suspicion of thyroid dysfunction (hypothyroidism or hyperthyroidism) with or without thyroid enlargement the patient was subjected to further clinical and laboratory evaluation

1. Biodata: The particulars of the patients including age, sex, locality etc were recorded.
2. Therapy: The particular regarding thyroid surgery, antipsychotic treatment and previous treatment for hyper or hypothyroidism was noted
3. Symptomatology: Non cardiac symptoms were recorded to aid the clinical diagnosis of thyroid dysfunction.

#### Results

**Table 1:** Gender wise distribution in thyroid disorder

Hyperthyroidism			Hypothyroidism		
Gender		N=40			N= 60
	No.	%	No.	%	
Male	5	12.5	3	5.0	
Female	35	87.5	57	95.0	
Total	40	100	60	100	

Females were found to have more cases of both hyperthyroidism and hypothyroidism.

Our study revealed 87.5% female and 12.5% male cases of hyperthyroidism 95% patients with hypothyroidism were females, rest were males.

**Table 2:** Distribution of hypothyroidic patients according to cardiac signs

Signs	Male N=03	Female N=57	Total	Percentage
P.P.>40 mm of Hg	01 (33.3%)	40 (70%)	41	68.33
Soft Heart Sound	0 (0%)	19 (33.3%)	19	31.66
Diastolic Hypertension	02 (66.7%)	31 (54.4%)	33	55
Sinus Bradycardia	01 (33.3%)	17 (29.8%)	18	30
Pericardial Effusion	01 (33.3%)	11 (19.3)	12	20

Low pulse pressure is the commonest cardiovascular finding in hypothyroidism (68.33%) followed by diastolic hypertension (55%), soft heart murmur (31.66%), sinus bradycardia (30%) and pericardial effusion (20%)

**Table 3:** Incidence of cardiac signs in

#### HYPERTHYROIDISM:

Signs	Male N=05	Female N=35	Total	Percentage
Pulse pr. > 40 mm of Hg	04	31	35	87.5
Loud Heart Sound	05	29	34	85
Sinus Tachycardia	05	28	33	82.5
Hyperdynamic Precordium	02	19	21	52.5
Ejection Systolic Murmur	02	17	19	47.5
Prolong QTc Interval	00	17	17	42.5
Precordial Thrill	02	08	10	25
Systolic BP >160 mm of Hg	03	16	19	47.5
Mid Systolic Click	02	06	08	20
Left Ventricular Hypertrophy	01	10	11	27.5
ST-T Changes	01	05	06	15
S3	00	02	02	05
Atrial Fibrillation	00	04	04	10

Pulse pressure >40 mm of Hg is the commonest finding in hyperthyroidism. Almost all patients of hyperthyroidism have sinus tachycardia.

## Discussion

Given the fact that thyroid hormone has an immense and wide effect on every organ system of our body, it is barely any surprise to see a wide range of symptoms and signs in patient suffering from thyroid disorder. Relationship between the thyroid hormone and heart is very well known today but do clinicians screen every patient with thyroid abnormality for cardiovascular abnormalities or vice versa, and if they do not ,should it be done? In our study we try to answer some of these questions.

### FEMALE PREDOMINANCE IN THYROID DISORDER

Various studies have established that thyroid dysfunction is much more common in the females as compared to the males.

**Biondi et al** (2002) found incidence of diastolic hypertension in 40% patients<sup>(5)</sup>

**Watanakunakorn et al** report a female to male ratio of 4.79:1 in their series of 400 cases of myxedema.<sup>(6)</sup>

**In Friedman et al** the ratio of female to male was 8:1.<sup>(7)</sup>

**Yazbeck et al** found female predominance (77.8%) in 45 patients, which he studied.<sup>(8)</sup>

**Peak incidence of age in hyperthyroidism and hypothyroidism was between third to fifth decade, for hypothyroidism the incidence was 70 % and for hyperthyroidism it was 70 %.**

Similar age incidence has been reported in the respective group by

**Watankunakorn et al** .<sup>(6)</sup>

**Jangid et al** (1991) found slow pulse in (47%) of their patients. Many workers showed that slow pulse rate is common in hypothyroid patients and is usually between 60-80 beats per min.<sup>(9)</sup>

The slow pulse and lower systolic blood pressure is a likely manifestation of the decreased cardiac output. Disorders of lipid metabolism including elevation in serum cholesterol along with increase in systemic vascular resistance have been clearly identified as risk factors for development of hypertension in hypothyroid patients.<sup>(9)</sup>

In 1949 **Kern et al**<sup>(10)</sup> concluded that pericardial effusion was a constant, early and major finding in myxedema heart disease .He also commented on the rarity of tamponade.

**Martin and Spathis et al**<sup>(11)</sup> reported the first case of cardiac tamponade in 1965. **Lee and Choo et al**<sup>(12)</sup> (1993) 57 found that low voltage electrocardiogram

with tachycardia in hypothyroidism is a warning sign of cardiac tamponade.

## Conclusion

Study of cardiac signs and symptoms in patient with hyperthyroidism revealed 87.5% prevalence of pulse pressure > 40 mm hg, 85% prevalence of loud heart sound, 82.5% cases of sinus tachycardia, 52.5% cases of hyperdynamic precordium, 47.5% cases of ejection systolic murmur, 42.5% cases of prolonged Qt interval, 25% cases of precordial thrill, 47.5% patients with systolic BP>160 mm Hg, 20 5 cases with mid systolic click, 27.5% patients with LVH , 15% cases with ST-T changes, 5% cases with S3 and 10% patients with atrial fibrillation.

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