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General Medicine

STUDY OF ECG CHANGES IN PATIENTS WITH PRIMARY HYPERTHYROIDISM

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ABSTRACT

Aims and objective: To study ECG changes in patients with Primary hyperthyroidism.

Material and methods: This is a retrospective observational study conducted at SKN Medical College and General Hospital, Pune. Patients diagnosed with overt hyperthyroidism as well as having subclinical hyperthyroidism were selected after taking into account the inclusion and exclusion criteria. ECG was recorded at the time of admission. TSH, T_3, T_4 levels were analysed.

Conclusion: Hyperthyroidism is associated with significant changes in ECG, sinus tachycardia being the commonest one.

KEYWORDS : Hyperthyroidism, Tachycardia, ECG

INTRODUCTION

Thyroid gland produces T3 and T4 which have effects on every system of human body. Many symptoms and signs recognized in patients with hyperthyroidism are due to excessive action of thyroid hormone on cardiovascular system. Recognised ECG changes in hyperthyroidism include tachycardia, arrhythmia and nonspecific ST-T wave changes.1,2 In primary hyperthyroidism, thyroid gland produces excessive amount of thyroid hormones.

MATERIAL AND METHODS

It was a single center retrospective observational study done in SKN medical college and General Hospital, Pune (Maharashtra) in period from July 1, 2018 to June 30, 2019. All admitted cases with newly detected primary hyperthyroidism were selected for study.

Following were the exclusion criteria: Age <12 years; chronic smokers; Patients with known pulmonary, cardiac or kidney disease; Patients with severe anemia; Patients with other endocrine disease; Patients on medications affecting heart rate such as β agonists, β antagonists, Digoxin, Theophylline and derivatives, calcium channel blockers.

ECG recording was done at the time of admission.

RESULTS

Table no.1

ECG	Female	Male	Total	Percentage
Normal	3	1	4	7.69
Sinus Tachycardia	32	8	40	76.92
LVH	13	3	16	30.76
Atrial Fibrillation	4	2	6	11.53
APC	2	0	2	3.84
VPC	1	0	1	1.92
ST-T changes	6	1	7	13.46

After considering exclusion criteria, total 52 patients were selected. Out of 52 patients, 40 were females and 12 were males. Normal ECG was seen in 4 patients (7.69%). Sinus tachycardia was most common finding seen in 40 patients (76.92%). LVH was found in 16 patients (30.76%). Atrial fibrillation was seen in 6 patients (11.53%). APC was found in 2 patients (3.84%). VPC was seen in 1 patient (1.92%). ST-T changes were found in 7 patients (13.46%).

DISCUSSION

In our study, out of 52 patients 48 (92.30%) had ECG abnormality. There was overall female preponderance. The female population constituted about 76.92% of total.

In present study, sinus tachycardia was most common ECG finding seen in 40 patients (76.92%). In a previous study by Satpathy et al it was found in 60.71%.[3] In another study by Archana et al 67% patients had sinus tachycardia on ECG.[4] Study by Ishtiaque HB et al noted similar finding in 60.19% patients.[5] LVH was found in 16 patients (30.76%) in current study. Similar findings were noted in 42.86% patients by Satpathy et al and in 2.5% patients by Archana et al.[3,4] Atrial fibrillation was seen in 6 patients (11.53%) in our study. Satpathy et al it noted same in 21.43% while Archana et al noted in 17.5%.[3,4] Ishtiaque HB et al found similar findings in 11.65% patients.[5] In our study, APC were found in 2 patients (3.84%). Similar findings were found in 7.14% patients by Satpathy et al.[3] In our study VPC were seen in 1 patient (1.92%). Satpathy et al noted same in 3.57% patients.[3] ST-T changes were found in 7 patients (13.46%) in present study. Satpathy et al noted ST-T changes in 21.43% patients.[3]

CONCLUSION

Hyperthyroidism affects multiple systems including cardiovascular system. Both overt and subclinical hyperthyroidism are associated with various ECG abnormalities like Sinus tachycardia, atrial fibrillation, LVH, ST-T changes etc. Hence in patients having such unexplained ECG changes, it is prudent to rule out hyperthyroidism as a cause.

ABBREVIATION

ECG – Electrocardiography, TSH – Thyroid stimulating Hormone, T3 –Triiodothyronine, T4 – Thyroxine, LVH – left ventricular hypertrophy, APC – Atrial premature complex, VPC– Ventricular premature complex

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