



STUDY OF ECG CHANGES IN PRIMARY HYPOTHYROIDISM

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ABSTRACT

AIMS AND OBJECTIVE: To study ECG changes in cases of Primary hypothyroidism.

MATERIAL AND METHODS: This is a retrospective observational study conducted at SKN Medical College and General Hospital, Pune. Both, overt and subclinical hypothyroid cases were selected after taking into account the inclusion and exclusion criteria. ECG and TSH levels were analysed.

CONCLUSION: Both overt and subclinical hypothyroidism are associated with significant changes in ECG; sinus bradycardia being the commonest one.

KEYWORDS : Hypothyroidism, Bradycardia, Ecg**INTRODUCTION**

T3 and T4 are produced by thyroid gland and have effects on every system. Many symptoms and signs recognized in patients with hypothyroidism are due to altered action of thyroid hormone on cardiovascular system.^{1,2} In primary hypothyroidism, thyroid gland does not produce sufficient 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 hypothyroidism were selected for study.

Following were the exclusion criteria: Age <12 years; 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	32	4	36	31.85
Sinus Bradycardia	37	8	45	39.82
Low voltage complexes	15	2	17	15.04
QTc prolongation	18	0	18	15.92
RBBB	3	0	3	2.65
ST-T changes	22	3	25	22.12
APC	2	0	2	1.76

After considering exclusion criteria, total 113 patients were selected. Out of 113 patients, 97 were females and 16 were males. Normal ECG was seen in 36 patients (31.85%). Sinus bradycardia was most common finding seen in 45 patients (39.82%). QT_c prolongation was found in 18 patients (15.92%). Low voltage QRS complexes were seen in 17 patients (15.04%). RBBB was found in 3 patients (2.65%). ST-T changes were seen in 25 patients (22.12%). APC was found in 2 patients (1.76%).

DISCUSSION

In our study, total 113 patients were studied. The cardiovascular system is one of the important targets of thyroid hormones and is sensitive to even minimal decrease in circulating thyroid hormones.^{1,2} In our study 68.15% patients had ECG abnormality. There was overall female preponderance. The female population constituted about 85.84% of total with female to male ratio being 6:1.

In present study, sinus bradycardia was most common ECG finding

seen in 45 patients (39.82%). In a previous study by Shrivastava et al it was found in 35.5%.³ In another study by Ramesh et al 40% patients had bradycardia on ECG.⁴ QT_c prolongation was found in 18 patients (15.92%) in current study. Similar findings were noted in 2.2% patients by Shrivastava et al and in 18.18% patients by Satpathy et al.⁵ Low voltage QRS complexes were seen in 17 patients (15.04%) in our study. Shrivastava et al it noted same in 16.7% while Ramesh et al noted in 30%.^{3,4} In our study, RBBB was found in 3 patients (2.65%). Similar findings were found in 4.4% patients by Shrivastava et al and in 7.5% by Ramesh et al.^{3,4} In our study ST-T changes were seen in 25 patients (22.12%). Shrivastava et al noted ST-T changes in 7.8% while Sharath et al noted same in 3.1%.^{3,6} APC was found in 2 patients (1.76%) in present study.

CONCLUSION

Hypothyroidism affects multiple systems including cardiovascular system. In both overt and subclinical hypothyroidism various ECG abnormalities like Sinus bradycardia, ST-T changes, QT_c prolongation are very common. Hence patients found to have unexplained ECG changes as reported above should be screened for hypothyroidism.

ABBREVIATIONS

ECG – Electrocardiography, TSH – Thyroid stimulating Hormone, T3 – Triiodothyronine, T4 – Thyroxine, QT_c – corrected QT interval, RBBB – Right Bundle Branch Block, APC – Atrial premature complex

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