



Cross Sectional Study of Cardiovascular Manifestations in Hypothyroidism

KEYWORDS

Hypothyroidism ,Electrocardiography (ECG),2D Echocardiogram (ECHO),carotid artery Doppler.

Dr.Putta Rajasekhar

Professor ,Department of General Medicine, Kurnool medical college Kurnool

Dr.A.Sunitha

Assistant Professor ,Department of General Medicine Anantapur medical college Kurnool

Dr.Gundrathi VamsiVihari

Junior Resident,. Department of General Medicine Kurnool medical college Kurnool

ABSTRACT Cardiac abnormalities associated with hypothyroidism attracted great deal of investigational effort .There are only few studies in our country to asses CVS parameters in hypothyroid patients .Hypothyroidism is known to cause reversible cardiac function in humans . This study aimed at studying the cardiovascular manifestations of hypothyroidism by ECG,2D ECHO, and carotid artery Doppler.Thus ,reassess the need for treatment even in the milder forms of the disease.

INTRODUCTION

Hypothyroidism is the most common clinical disorder of thyroid function .it is most often due to disorder of the thyroid gland that leads to the decrease in thyroid production and secretion of thyroxine(T4) and triiodothyroxin (T3), in which case it is referred to as primary hypothyroidism. Hypothyroidism is less often caused by decreased thyroid stimulation by TSH,which is termed as central,secondary hypothyroidism .

Hypothyroidism is characterized by a broad clinical spectrum ranging from an overt state of myxedema ,end organ effects and multi system failure to an asymptomatic or sub-clinical condition with normal levels of thyroxine and triiodothyroxineand mildly elevated levels of serum thyrotropin. The prevalence of hypothyroidism in the developed world is about 4-5%. There are no national wide studies on the prevalence of hypothyroidism in India. A cross sectional study ,multicenteredepidemiology study conducted at eight sites in India namely Bangalore ,Chennai ,Delhi ,Goa ,Ahmedabad ,Hyderabad ,Kolkata ,and Mumbai by Unnikrishnan AG et al to study the prevalence of hypothyroidism in India adult population revealed that the prevalence of hypothyroidism in adult was 10.95% made that of subclinical hypothyroidism was 8.02 %.The prevalence of hypothyroidism inadult was more in females than males (15.86% vs 5.02%) and more in older than younger (13.11% vs 7.53%).

Cardiovascular complications are some of the most profound and reproducible clinical findings associated with hypothyroidism .Hypothyroidism is associated with increased mortality and morbidity. The dysfunction ranges from functional systolic /diastolic dysfunction to overt failure and coronary artery disease .The need of this study is to assess the CVS parameters in new hypothyroidism patients by ECG and ECHO . The completely reversible nature of these complications Is well known

AIMS AND OBJECTIVES

To study cardiovascular complications in newly diagnosed 50 hypothyroid patients by ECG, ECHO and carotid Doppler who came to the Govt general hospital ,Kurnool ,Andhra Pradesh which includes both outpatients and inpatients .

METHODOLOGY

Source of data is newly diagnosed 50 hypothyroid patients by ECG, ECHO and carotid Doppler who came to the Govt general hospital ,Kurnool ,Andhra Pradesh which includes both outpatients and inpatients. Study duration December 2013 – December 2014. Inclusion criteria include newly diagnosed patients And detected hypothyroid patients not on treatment .Exclusion criteria is patients with known cardiac disease,patients with COPD ,severe anaemia ,diabetes or any other endocrinal disorders and patients taking medication that alter the thyroid function like beta blockers ,lithium ,OCP s ,steroids ,and alcohol.Investigations are thyroid profile ,complete blood picture ,ESR ,random blood sugar ,urine routine,blood urea serum creatinine ,serum electrolytes, lipid profile,ECG ,2D ECHO ,carotid Doppler ,ultra sound of thyroid .Study design a cross sectional clinical study.

RESULTS AND DISCUSSION

Table showing age and sex distribution

Age of the study is between 21-60 years .Most patients belonged to the age of 31-40 years .there were an overall female predominance over all age groups .the female population constituted about 72%of the total .According to Harrison book of internal medicine 18 th edition mean age is 60 years .

Age in years	Male		female		total	
	No	%	No	%	No	%
21-30	4	28.6	13	36.1	17	35
31-40	5	35.7	17	47.2	22	44
41-50	3	21.4	4	11.1	7	14
51-60	2	14.3	2	5.6	4	8
Total	14	100	36	100	50	100
Mean+/-SD	38.+/-9.44		34.8+/-7.8		35.8+/-8.34	

Table showing systemic examination findings

On CVS examination cardiomegaly is found in 8% of the patients diminished heart sounds in 14 patients accounting 28% of the total indicating probability of pericardial effusion.Reported pericardial effusion to occur in 30% to 80% of patients with hypothyroidism

CVS examination	No	%
cardiomegaly	4	8
Diminished heart sounds	14	28

Table showing lipid profile

There is increase in total cholesterol ,LDL,VLDL,TG,decreased levels of HDL .AlkaM.Kanaya et al in 2002 showed increased total cholesterol .This is also agreement with the literature given in Williams textbook of endocrinology.

TSH mU/L	TC (mg/dl)	HDL (mg/dl)	LDL (mg/dl)	VLDL (mg/dl)	TG(mg/dl)
10-20	183.6	36.3	121.3	36.3	197.8
21-50	189.3	35.2	122.3	38.2	202.3
>50	191.3	34.4	1219.6	39.3	226.5

Tables showing ECG changes

ECG normal in 17 patients (34%).Among abnormal ECG which constitutes 66% of the patients ,low voltage complexes are present in 24% of patients .On ECG the most common findings were bradycardia ,present in 40% cases .BBB found in 12% respectively. This finding is consistent with other studies like R.Verma.

No of patients	Normal ECG	bradycardia	LVC	ST-T	BBB
	17	20	12	9	6

Table showing pericardial effusion in ECHO

Pericardial effusion is seen in 14 cases accounting to 28%.

No of patients	mild	Moderate	Severe
	12	1	1

Table showing diastolic dysfunction in ECHO

Diastolic dysfunction seen in 26%,majority of them being mild dysfunction 10 among 13 patients.In a study by verma in 1995 it is seen that 27% of patients had diastolic dysfunction.In a study by R.verma in1995 it was seen that 27% of the patient had diastolic dysfunction .Systolic dysfunction is seen in 10%of patients .For Far et al and others described low systolic dysfunction in hypothyroidism.

No of patients	mild	Moderate	Severe
	10	3	0

Table showing cardiovascular manifestations

carotid Doppler showed intimal thickening in 5 cases.In a study conducted by Monzani Fetal showed the effect of L-thyroxine replacement on lipid profile and intimal thickening in subclinical hypothyroidism suggesting association of carotid artery thickening in hypothyroidism patients .

No of patients	ECG	ECHO	CAROTID DOPPLER
	33	26	5

CONCLUSION

Hypothyroidism is the most common thyroid disorder affecting 3.8-4.6%of general population .Females are predominantly affected mostly in 4 th decade.Cardiovascular abnormalities are very well described in hypothyroidism. In the present study these ranged from bradycardia ,low voltage complexes to pericardial effusion and diastolic dysfunction,which in promptly invented are treatable.

Carotid artery intimal thickening which is predictive of atherosclerosis and cardiovascular events is present in significant (10%)number of patients.Hence all patients of hypothyroidism should be screened for carotid artery intimal thickening ,as early intervention can be prevent the cardiovascular morbidity and mortality.

Hence more studies are needed to validate this association of cardiovascular events with hypothyroidism,to treat these ailments and thereby improving the quality of life.

REFERENCE

1 .Lewis E.Braverman ,Robrt D. Utiger the thyroid: a fundamental and clinical text.9thedition | 2. Robert CG Ladenson PW.hypothyroidism.p698-699 || 3. BiondiB,klein l.hypothyroidism as a risk factor for cardiovascular diseases. | 4. Prevalence of hypothyroidism In adult population :an epidemiological study in eight cities of india .Unnikrishnan SG | 5. FahrG.myxedema heart JAMA 1925;81:315-349. || 6.KurtzmanRS ,Otto DL ,ChepeyJJ.myxedema heart diseases.Radiology 1965;84:624. || 7. Klein I .DanziS.Thyroid diseases and the heart 2007;116;1725. ||