



A Study about Demographic, Clinical, Comorbidity and lipid profile of hypothyroid patients attending a tertiary health care institute of Rajasthan

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Abstract

Background: Hypothyroidism is a common disorder. It may emerge or worsen other comorbidities. This study was conducted to know demographic, clinical, comorbidity and lipid profile of hypothyroid patients in Rajasthan in order to understand current scenario and to know desired improvement in strategy.

Method: This cross sectional study was conducted for the duration of six months. One hundred and three hypothyroid patients participated in the study. Thirteen patients were drop outs and ninety participated actively. These patients were evaluated for different parameters like age, sex, presence of clinical symptoms, comorbidities and lipid profile.

Results: Mean age of study population was 49 years with male female ratio 1:4. Subclinical hypothyroidism was present in 42.2% patients. Comorbidities were found in 65.5% patients. Hypertension was the most common comorbidity followed by diabetes, chronic kidney disease, coronary artery disease and stroke. Dyslipidemia was present in 71.1% patients. Most common deranged parameter was LDL followed by triglyceride, total cholesterol and HDL.

Conclusion: High percentage (42.2%) of subclinical hypothyroidism shows need of screening programme for evaluation of thyroid disorder in general population. High percentage of deranged lipid profile (71.1%) and presence of comorbidities (65.5%) warrant the need of evaluation of every hypothyroid patient to limit morbidity and mortality.

Keywords: Hypothyroidism, dyslipidemia, comorbidity.

Introduction

Hypothyroidism is a common endocrinal disorder. Crude prevalence of hypothyroidism is 31.1/1000 population and the overall crude incidence is 7/1000 population¹. Hypothyroidism may present

with variety of clinical features like lethargy, dry skin, hair loss, cold intolerance, constipation, weight gain, menstruation irregularity, edema, hoarseness of voice, goiter, myopathy, paresthesia. On the basis of presence or absence of

clinical features hypothyroidism can be classified as clinical and subclinical hypothyroidism respectively. Hypothyroidism is directly associated with hypertension, weight gain and lipid profile derangement which are well known risk factors for emergence of other non communicable diseases like diabetes mellitus, coronary artery disease, stroke, chronic kidney disease¹⁻⁴. Meticulous evaluation of hypothyroid patients is needed to look out for these risk factors and possible comorbidities. Hypothyroidism may worsen the pre existing morbidities. Not much work has been done before regarding demographic, clinical, comorbidity and lipid profile status of hypothyroid patients in Rajasthan, India. This study was conducted for the evaluation of same in order to understand needed improvement in current strategy and to improve framework for control of the disease.

Materials and Methods

This cross sectional study was conducted for the duration of six months (January to July, 2018). All cases of hypothyroidism were included in the study whether old or new cases, indoor or outdoor cases. Hypothyroid patients taking anti hyperlipidemic drugs were excluded. Cases of drug induced hypothyroidism were also excluded. After informed consent all hypothyroid cases were subjected to detailed history and clinical examination. Previous records were reviewed. All patients were evaluated for blood pressure, fasting and postprandial blood sugar, glycated hemoglobin, renal function test, serum protein, urine complete, serum electrolytes, ultrasound of abdomen, ECG, 2D Echo of heart, fasting serum lipid profile and thyroid profile. Other related investigations were also done as per the need. Patients were evaluated for age, sex and clinical features. Presence of comorbidities like hypertension, diabetes mellitus, chronic kidney disease (CKD), coronary artery disease (CAD) and stroke were also observed on the basis of current evaluation and previous records. Distribution of serum lipids was seen. Criteria

used for deranged lipid profile was taken as total cholesterol level equal or more than 200mg/dl, triglyceride level equal or more than 150 mg/dl, LDL level equal or more than 100 mg/dl, HDL less than 40 mg/dl in males and less than 50 mg/dl in females. Statistical evaluation was done in simple proportion, percentage, tabulation and chart form.

Results

One hundred and three hypothyroid patients participated in current study. During course of the study thirteen patients refused to participate and considered as drop outs. Ninety hypothyroid patients participated actively. Among study population (n=90) nineteen patients were male and seventy one patients were female with male female ratio nearly 1:4. Mean age of study population was 49 years with age ranges from 28 to 71 years. Among ninety hypothyroid patients 42.2% (n=38) patients had subclinical hypothyroidism and 57.8% (n=52) patients had clinical hypothyroidism. (Figure 1,2)

On evaluation of comorbidities related to hypothyroidism it was found that 65.5% (n= 59) patients had comorbidities in form of hypertension, diabetes mellitus, chronic renal disease, coronary artery disease, stroke either in isolated or in combination form. No comorbidity was found in rest cases (34.5%, n=31). Hypertension was found as most common comorbidity presented in 37.8 % (n=42) hypothyroid patients. Diabetes mellitus was present in 21.1% (n=19) hypothyroid patients followed by chronic kidney disease (12.6%, n=14), coronary artery disease (7.2%, n=8) and stroke (0.9%, n=1). (Figure 3,4)

On evaluation of lipid profile it was found that 71.1% (n=64) patients had deranged lipid profile while 28.9% (n=36) had no lipid derangement. Most common derangement was found in LDL values as 56.6% (n=51) hypothyroid patients had elevated LDL values. Mean LDL value of study population was 112.9 mg/dl, ranges from 74 to 182 mg/dl. Triglyceride was deranged in 36.7%

(n=33) hypothyroid patients. Mean triglyceride value was 199 mg/dl, ranges from 69 to 477 mg/dl. Total cholesterol was deranged in 25.5% (n=23) hypothyroid patients. Mean total cholesterol value was 213.66 mg/dl, ranges from 114 to 539 mg/dl. HDL was deranged in 23.3% (n=21) hypothyroid patients. Mean HDL value was 56.8 mg/dl, ranges 37 to 85 mg/dl. (Figure 5,6 and Table 1)

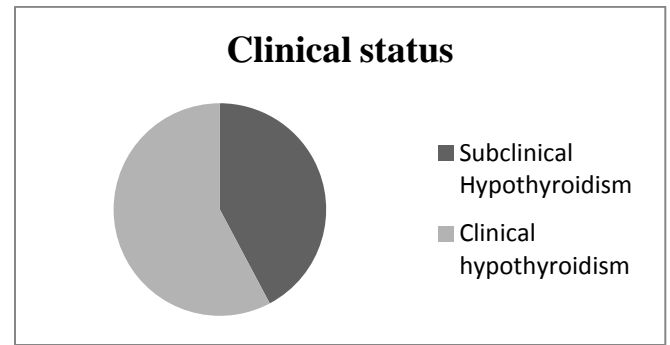


Figure 2 Showing clinical status of hypothyroid cases

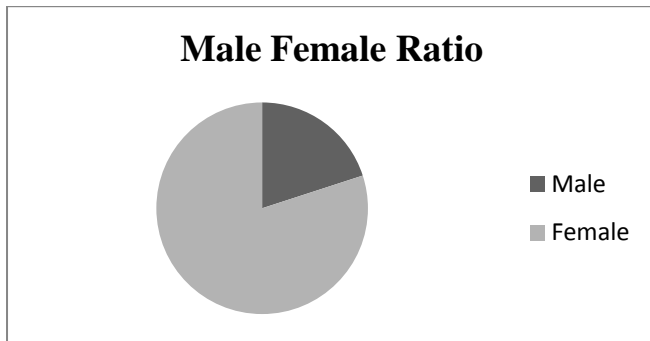


Figure 1 Showing male female ratio in hypothyroid cases

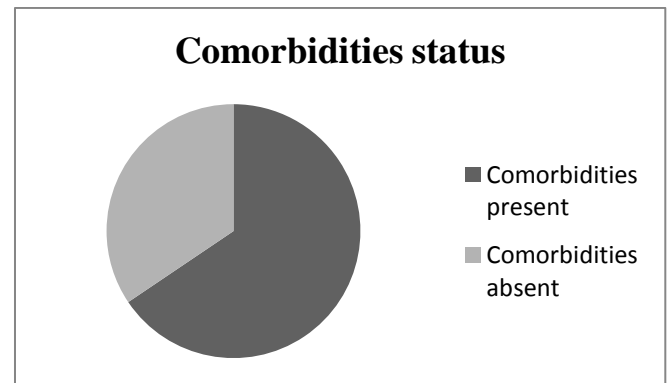


Figure 3 Showing comorbidity status of hypothyroid cases

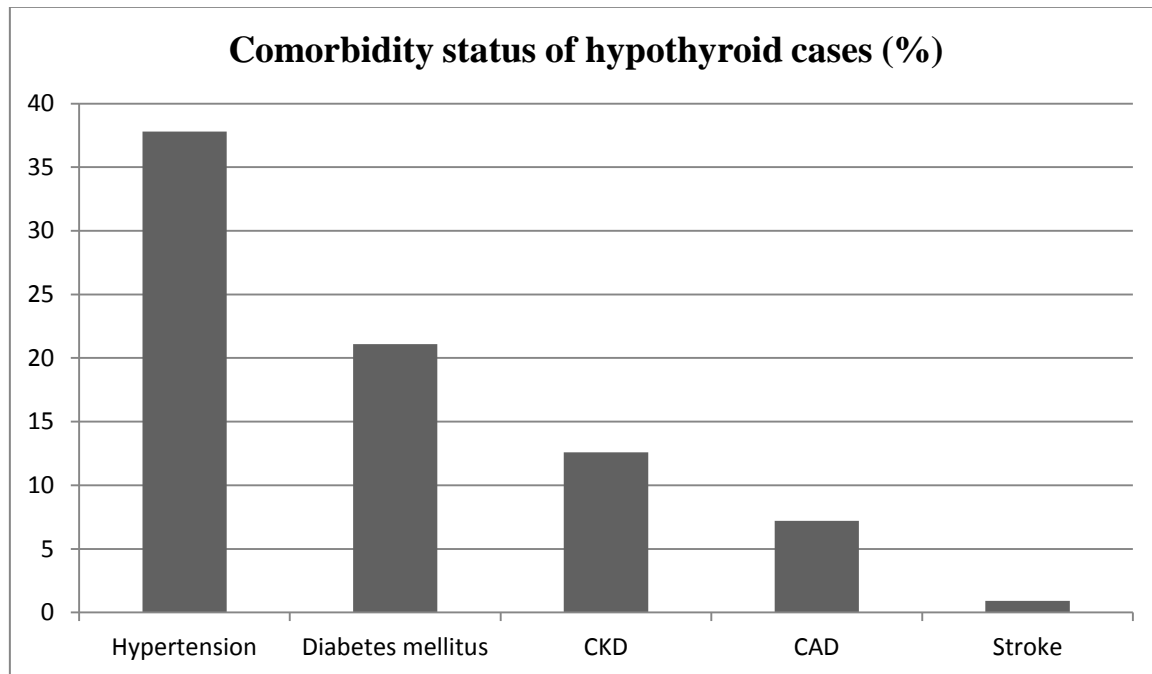


Figure 4 Showing frequency of comorbidities (%) among hypothyroid cases

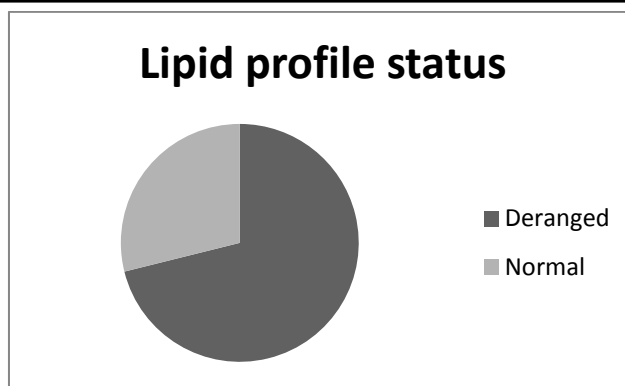


Figure 5 Showing lipid profile status of hypothyroid cases

Table 1 Showing Lipid profile statics among hypothyroid cases

Parameter	Cases (n) with deranged parameter	Percentage (%)	Mean (mg/dl)	Range (mg/dl)
LDL	51	56.6%	112.9	74 to 182
Triglyceride	33	36.7%	199	69 to 477
Total cholesterol	23	25.5%	213.7	114 to 539
HDL	21	23.3%	56.8	37 to 85

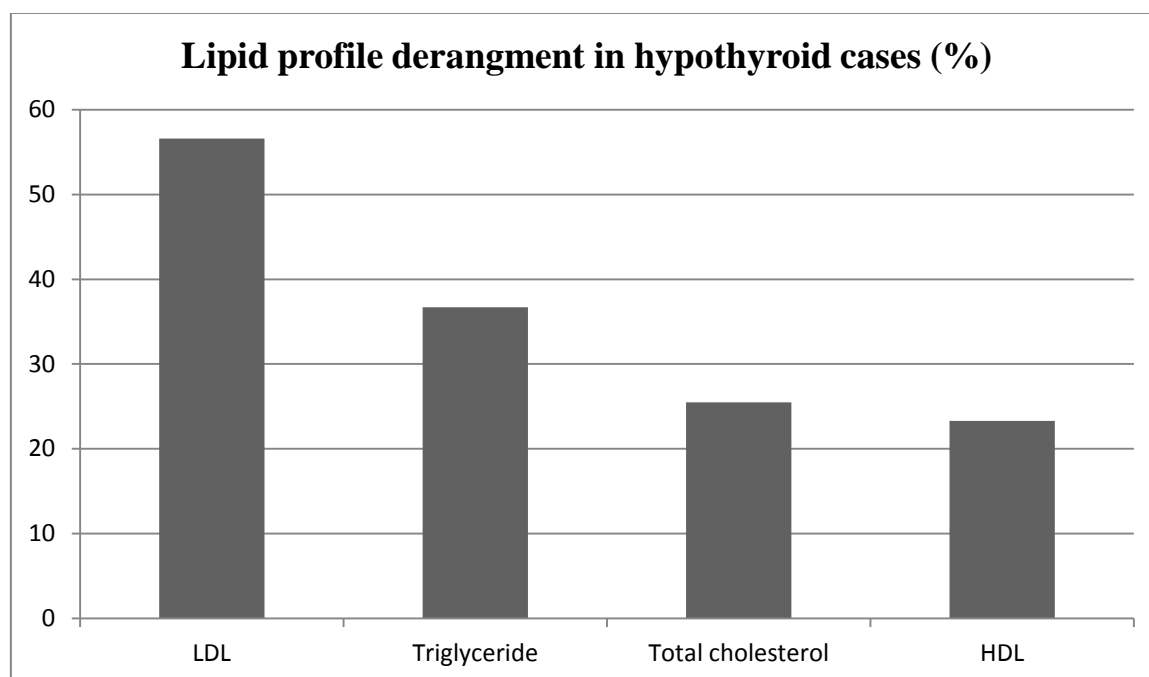


Figure 6 Showing frequency of lipid parameters among hypothyroid cases

Discussion

Hypothyroidism is a common endocrinological disorder and has variety of presentation. In current study ninety hypothyroid patients participated actively. Among study population (n=90) male: female ratio was nearly 1:4. Other Indian studies like Paul J et al⁵, Anandhasayanam A et al⁶ found male female ratio 1:2.1 and 1:1.3 respectively. Studies conducted on larger population outside India found higher male female ratio like Giorda

CB et al¹, Chen WH et al⁷ found male female ratio nearly 1:6 and 1:10 respectively. Results of current study as well as previous studies support the fact that hypothyroidism is more common in females.

Mean age of current study population was 49 years. Indian studies like Paul et al⁵, Anandhasayanam A et al⁶ found mean age 43.17 years and 54.4 years respectively. Study by Chen WH et al⁷ found mean age 41.1 years among

hypothyroid patients. Age wise distribution of hypothyroidism was observed by Giorda CB et al¹ and found hypothyroidism rose steadily with increasing age and then started to decline in the very old age.

Results of current study showed that 42.2% of hypothyroid patients had subclinical hypothyroidism and 57.8% patients had clinical hypothyroidism. According to Paul et al⁵ 48.8% and 51.2% of hypothyroid patients were suffering from overt hypothyroidism and subclinical hypothyroidism respectively. Abdelhai AR et al⁸ found subclinical hypothyroidism in 37.5% patients and clinical hypothyroidism in 62.5% of hypothyroid patients. High percentage of subclinical hypothyroidism warrants the need of screening programme for hypothyroidism in general population.

In current study 65.5% of hypothyroid patients had one or more comorbidities. Comorbidity evaluation in current study found that hypertension was present in 37.8 % cases, Diabetes mellitus in 21.1%, chronic kidney disease in 12.6%, coronary artery disease in 7.2% and stroke in 0.9% of hypothyroid patients. Paul et al⁵ found hypertension in 29.3% and diabetes mellitus in 31.7% of hypothyroid patients. Another Indian study Anandhasayanam A et al⁶ found that 28.2% of hypothyroid patients suffered with diabetes and 22.6% with hypertension. According to Chen WH et al⁷ hypertension, diabetes, stroke, chronic kidney disease, heart failure were present in 13.4%, 8.4%, 3%, 0.69%, 0.69% of hypothyroid patients respectively. Abdelhai AR et al⁸ found 75% of hypothyroid patients were suffering from comorbidities. In the study 31.25%, 31.25%, 43.75%, 43.75%, 12.5% of hypothyroid patient were suffering from hypertension, diabetes, coronary artery disease, renal impairment and stroke respectively. Giorda CB et al¹ found strong association between hypothyroidism and diabetes type 1, type 2 and gestational diabetes. Hypothyroidism is also associated with insulin resistance¹.

In current study on evaluation of lipid profile it was found that 71.1% of hypothyroid patients had deranged lipid profile. In study by Anandhasayanam A et al⁶ 20.8% of hypothyroid patients had hyperlipidemia. Chen WH et al⁷ found hyperlipidemia in 14.5% of hypothyroid patients. Kibria KG⁹ et al found hyperlipidemia in all (100%) hypothyroid patients. Not only clinical even subclinical hypothyroidism is associated with increased serum total cholesterol and LDL-Cholesterol levels. There is a potential association between subclinical hypothyroidism and atherosclerosis¹⁰. Higher percentage of hyperlipidemia in hypothyroid patients of Rajasthan is alarming. This study recommends screening of comorbidities and lipid profile in every patient of hypothyroidism.

In current study LDL derangement was present in 56.6% of hypothyroid patients followed by triglyceride (36.7%), total cholesterol (25.5%) and HDL (23.3%). Previous studies did not show uniform pattern of lipid derangement⁹⁻¹¹. Further studies are required to establish the pattern.

Common diseases like hypothyroidism affect large population. Control over common diseases can limit morbidity and mortality significantly. Appropriate strategy is needed to get desired outcome. Screening, early diagnosis, comorbidity evaluation and limitation, prevention of complications, knowledge about entity are tools which can be used to achieve desired outcome.

Conclusion

This study recommends screening of thyroid disorder in general population as study found high percentage of subclinical hypothyroidism. Non specific symptoms like lethargy, dry skin, weight gain should not be ignored at early age and need proper evaluation. Awareness about the disease is needed in general population. Every hypothyroid patient should be evaluated for lipid profile and presence of comorbidities.

Sources of support: Nil

Conflict: Nil

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