



Clinical profile of hypothyroidism: A cross sectional study

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Abstract

Background: Hypothyroidism patients are more prone for co morbidities and complication compared to other individuals especially with subclinical manifestations. It becomes crucial to treat hypothyroidism so as to prevent the associated complications. Hence the present study was undertaken with the objective to assess the clinical profile of patients with hypothyroidism.

Methodology: This was a hospital based cross sectional study carried at Department of Medicine, Navodaya Medical College, Raichur during 2015-17. Fifty Newly diagnosed hypothyroidism patients who fit into the inclusion criteria were taken for the study. The patients underwent relevant investigations which comprised of thyroid profile and clinical evaluation.

Results: Majority of the patients were in the age group of 30-40 years with the mean age of 42 years. Hypothyroidism was more among females than males. Most common symptoms were of weight gain, lethargy, dry skin, hoarseness of voice, cold intolerance and menstrual symptoms. On general examination most common findings are increased BMI found in 31 of 50 patients accounting to 62% of the total, dry skin found in 19 patients (38%), pallor was present in 26% patients, BP above 140/90 mm Hg in 22% patients.

Conclusion: Hypothyroidism was more common among 40 years females. Early diagnosis of subclinical hypothyroidism helps in preventing complications.

Keywords: clinical profile, hypothyroidism, weight loss, lethargy, pallor

Introduction

Thyroid hormones exert direct cellular effects on almost all tissues of the body. It causes multi organ dysfunction due to deranged metabolism^[1]. Cardiovascular complications are some of the most profound and reproducible clinical findings associated with thyroid disease. Hypothyroidism is associated with increased cardiovascular mortality and morbidity. The dysfunction ranges from functional systolic/diastolic dysfunction to overt failure and coronary artery disease^[1].

Severe and chronic cases of hypothyroidism commonly present with dry, rough and scaly skin. The skin is cold and pale due to cutaneous vasoconstriction. Decreased sweat and sebaceous gland secretion causes dry skin. Easy bruising and delayed healing is due to increased capillary fragility. Nails are brittle with vertical and transverse fissures. Hair is sparse, dry, light colored and brittle. Non-pitting edema in the feet and legs, peri orbital puffiness seen, tongue is thick due to the accumulation of mucopolysaccharides, hydrophilic hyaluronic acid and chondroitin sulphate in the ground substance of the dermis and other tissues. In secondary Hypothyroidism the skin changes are less striking with thin and finely wrinkled, pale, cool skin. Depigmentation of normally pigmented skin like the areola occurs in pituitary causes of hypothyroidism^[2].

The identification of patients with hypothyroidism is an important individual and public health issue. The completely reversible nature of these complications is well known. Hence, early detection and timely treatment could help to prevent cardiovascular involvement. Thus the need of this study was to assess the clinical profile of newly diagnosed

hypothyroid patients.

Methodology

This was a hospital based cross sectional study carried during 2015- 2017. The study participants comprised of newly diagnosed hypothyroidism outpatients and inpatients visiting Department of General Medicine, Navodaya Hospital, Raichur. The participants were in the age group of 18-60 years and confirmed hypothyroidism was included in the study. While patients with cardiac diseases, COPD, anaemia, diabetes mellitus and those on medication that alter thyroid function were excluded from the study. The participants underwent a detailed investigations which includes Haemoglobin, ESR, T3, T4 and TSH. The date was recorded in the pre designed pre tested proforma after obtaining informed consent from the participants.

Ethical clearance was obtained from Institutional Ethical Committee while informed consent was obtained from the participants.

Statistical tests: The participants were selected using simple random sampling technique. A descriptive analysis was carried out using SPSS version 18. Graphs and tables were generated using Microsoft word and excel. Results were presented in percentage, mean, Standard deviation and frequency.

Results

Fifty cases of newly detected hypothyroidism with no other co-morbidities who presented to the Department of Medicine, Navodaya Medical College, Raichur, were clinically evaluated and underwent relevant investigations, including

thyroid profile estimation, cardiac evaluation using ECG and 2D ECHO. Study period was from October 2015 to September 2017.

There was a female preponderance (3:1) in this study. Majority of patients were between 3rd and 4th decade of life (Figure No.1). On general examination most common findings are increased BMI found in 31 of 50 patients accounting to 62% of the total, dry skin found in 19 patients (38%), pallor was present in 13 patients (26%), bradycardia was found in 15 patients (30%), BP above 140/90 mm Hg in 11 patients (22%), edema in 09 patients and Goiter was found in 4 patients accounting 18% to 8% respectively. (Table No.1)

Most common symptoms were of lethargy found in 80%, weight gain found in 54%, cold intolerance in 46%, constipation in 40%, dry skin in 38%, hoarseness of voice in 38%, dyspnoea in 34% followed by menstrual symptoms in 15 female patients accounting to 30% of total patients.

On cardiovascular examination diminished heart sound was found in 10 patients accounting for 20% of the total indicating probability of pericardial effusion. CNS examination revealed delayed ankle jerk in 40% followed by hoarseness of voice in 38% of patients. A significantly deranged lipid profile, with higher total cholesterol, LDL VLDL, triglycerides and lower HDL fractions were seen.

Fifty patients were included in the study, majority of the participants were female with the mean age of 42 years.

Based on the clinical evaluation the pulse rate of the patients were as shown 2% had pulse rate between 40-49, pulse rate of 50-59 was found in 26%, 12% between 60-69, 38% had pulse rate between 70-79, 20% between 80-89 and 2% between 90-99. Normal ECG was found in 13 patients accounting to 26% of patients. Bradycardia was the most common finding seen in 15 patients accounting for 30%, Low voltage complexes is seen in 12 patients accounting to 24%, LBBB, RBBB and ST segment changes were seen in 10%, 08% and 18% of patients respectively.

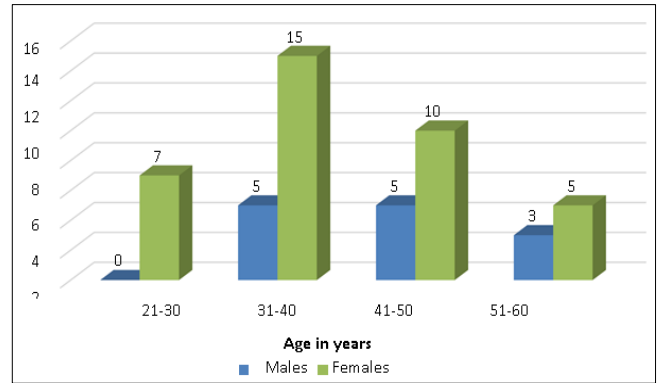


Fig 1: Age and Gender Distribution

Table 1: Clinical Profile of patients with Hypothyroidism

Variable	No. of cases (N=50)	Percentage (%)
Clinical presentation		
Lethargy	40	80
Hoarseness	19	38
Dyspnea	17	34
Weight gain	27	54
Constipation	20	40
Cold intolerance	23	46
Depression	13	26
Dry skin	19	38
Menstrual symptoms	15	30
General examination		
Pallor	13	26
Dry skin	19	38
BMI > 25kg/m ²	31	62
Goitre	04	08
Edema	09	18
Pulse <60/min	14	28
BP 120/80 to 140/90	25	50
BP above 140/90	11	22
Pulse rate (beats/min)		
40-49	01	02
50-59	13	26
60-69	06	12
70-79	19	38
80-89	10	20
90-99	01	02
Systemic examination		
CVS		
Diminished heart sound	11	22
CNS		
Delayed ankle jerk	20	40
Hoarse voice	19	38

Discussion

On general examination most common findings were increased BMI found in 31 of 50 patients accounting to 62% of the total, dry skin found in 19 patients (38%), pallor was present in 13 patients (26%), bradycardia was found in 14 patients (28%), BP above 140/90 mm Hg in 11 patients (22%), edema in 09 patients and Goiter was found in 4 patients accounting 18% to 8% respectively.

Klein in his study of 907 patients found the incidence of hypertension to be 21%^[3]. Bradycardia and decreased stroke volume both account for decreased cardiac output in patients of hypothyroidism. Kral *et al* (1992) studied 19 patients of hypothyroidism documented hypertension in 35% patients.⁴ Delayed relaxation of the ankle jerk was the most common finding present in 20 patients which constitutes 40% of the patients, which correlates well with the description in most of the standard textbooks of endocrinology² and in various Studies by Lambert and Underdahl⁵.

On cardiovascular examination diminished heart sounds were found in 11 patients accounting for 22% of the total indicating probability of pericardial effusion. Rawat B and Satyal A reported pericardial effusion to occur in 30% of patients with hypothyroidism which correlates with our study^[1].

There was an increase in total cholesterol, LDL, VLDL, triglycerides and decrease of HDL in our study. Alka M. Kanaya *et al* in 2002, also showed increase of total cholesterol and triglycerides. This is also in agreement with the literature given in Williams text book of endocrinology. Term burdge, wmg 1977 also showed similar results^[6, 7].

Skin and Appendages: Severe and chronic cases of hypothyroidism commonly present with dry, rough and scaly skin. The skin is cold and pale due to cutaneous vasoconstriction. Decreased sweat and sebaceous gland secretion causes dry skin. Easy bruising and delayed healing is due to increased capillary fragility. Nails are brittle with vertical and transverse fissures. Hair is sparse, dry, light coloured and brittle. Non-pitting edema in the feet and legs, periorbital puffiness seen, tongue is thick due to the accumulation of mucopolysaccharides, hydrophilic hyaluronic acid and chondroitin sulphate in the ground substance of the dermis and other tissues. In secondary Hypothyroidism the skin changes are less striking with thin and finely wrinkled, pale, cool skin. Depigmentation of normally pigmented skin like the areola occurs in pituitary causes of hypothyroidism^[8, 2].

Myocardial and vascular endothelial tissues have receptors for thyroid hormones and are sensitive to changes in the concentrations of circulating thyroid hormones. The importance of thyroid hormones in maintaining cardiovascular homeostasis can be deduced from clinical and experimental data showing that even subtle changes in thyroid hormone concentrations — such as those observed in subclinical hypothyroidism and low triiodothyronine syndrome — adversely influence the cardiovascular system^[9, 10].

The CVS manifestations of hypothyroidism include the following, Decreased contractility Decreased heart rate Increased systemic vascular resistance. Increased capillary permeability (pericardial effusion). Cardiovascular manifestations are frequent findings in hypothyroidism. The main mechanisms of action are: Direct effects at the cellular level Interaction with the sympathetic nervous system. Through alteration of the peripheral circulation and energy metabolism

The molecular and cellular mechanisms are responsible for cardiovascular effects of thyroid hormone. Thyroid hormone may exert both genomic and non-genomic effects on cardiac myocytes. The genomic effects of thyroid hormone are mediated by transcriptional activation or repression of specific target genes that encode both structural and functional proteins. This process begins with the entry of triiodothyronin (T3), the biologically active thyroid hormone, into the cardiac myocyte through specific transport proteins located within the cell membrane. In the cardiac myocyte, T3 enters the nucleus and interacts with specific transcriptional activators (nuclear receptor-1) or repressors (nuclear receptor-2) specific sequences of DNA (thyroid responsive elements) that, in-turn, by acting as a cis- or trans- regulators, modify the rate of transcription of specific target genes^[11].

Among various proteins whose expression is modulated at the transcription level, the most extensively characterized are myosin heavy chains and the sarcoplasmic reticular proteins involved in the regulation of intracellular calcium handling, namely, calcium activated ATPase and its inhibitory cofactor, phospholamban. In humans, the β isoform of the myosin heavy chain is more prevalent than the α isoform and the ratio is only marginally modified by thyroid hormone^[12].

Besides its effects on the myocardium, thyroid hormone may exert effects on the cardiac output by altering preload and afterload. The effects of thyroid function on venous compliance, volume and endothelial dysfunction are elusive^[12].

In severe hypothyroidism heart is enlarged, the heart sounds are diminished in intensity, these findings are largely due to pericardial effusion, which is rich in proteoglycans. Hypertension is present in 10-20% of patients with hypothyroidism. Diastolic pressure is elevated to a greater extent than systolic blood pressure^[13].

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