


Original Research Article

A study on prevalence of pericardial effusion in newly diagnosed adult hypothyroid patients

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Abstract

Introduction: Hypothyroidism is a common endocrine disorder resulting from a deficiency of thyroid hormone. It usually is a primary process in which the thyroid gland produces insufficient amounts of thyroid hormone. It can also be secondary that is lack of thyroid hormone secretion due to the failure of either adequate thyroid - stimulating hormone (TSH) secretion from the pituitary gland or thyrotropin-releasing hormone (TRH) from the hypothalamus (secondary or tertiary hypothyroidism). Pericardial effusion is frequently found in patients with hypothyroidism, but it is rarely associated with cardiac tamponade. Hypothyroidism complicated by cardiac tamponade is rarely referenced in the medical literature.

The aim of the study: To find a correlation between severity of disease and presence of pericardial effusion.

Materials and methods: The study was conducted in 2017. Patients attending the Outpatient Clinic of the Department of Endocrinology who satisfied the inclusion criteria were registered for the study after obtaining their consent. A detailed questionnaire was used to elicit symptoms of hypothyroidism. The patients were examined for signs of hypothyroidism. Special attention was given to the examination of the cardiovascular system to look for clinical features of pericardial effusion.

Results: The prevalence of pericardial effusion in this study was 17%. 2 out of the 70 hypothyroid patients showed evidence of pericardial effusion. Mild pericardial effusion was found in 11 patients (15.71%) and moderate pericardial effusion in 1 patient (0.01%).

Conclusion: Clinical features of pericardial effusion show statistically significant association with its presence on echocardiogram. Macroglossia was more commonly found in patients with Pericardial Effusion. ECG and CXR can be used to predict the presence of Pericardial Effusion.

Key words

Hypothyroidism, Pericardial Effusion, Echocardiogram, ECG.

Introduction

The occurrence of pericardial effusion in hypothyroidism appears to be dependent on the severity of the disease. Pericardial effusion (PE) may be a frequent manifestation in myxedema, an advanced severe stage, as previously found, but is rarely associated with mild hypothyroidism [1]. The first known description of pericardial effusion in a hypothyroid patient dates back to 1918. Since then, several publications have reported on the association between hypothyroidism and pericardial effusion, and even other serous effusions. Pericardial effusion is considered the most frequent cardiovascular complication of hypothyroidism, with a prevalence estimated to be between 30% and 80%. The recent studies concluded that PE is extremely infrequent in hypothyroidism, with an incidence of 3% to 6% [2]. To our knowledge, about 20 cases of hypothyroid with cardiac tamponade have been reported in the literature. Cardiac tamponade is usually a consequence of increased pericardial pressure with an accumulation of pericardial effusion. Pericardial effusion may be caused by acute pericarditis, tumor, uremia, hypothyroidism, trauma, cardiac surgery, or other inflammatory/ non-inflammatory conditions [3]. A small pericardial effusion can cause clinically significant cardiac tamponade when it accumulates rapidly. It is important to suspect cardiac tamponade when patients have hemodynamic compromise regardless of the amount of pericardial effusion. Here we report an uncommon case of hypothyroidism with cardiac tamponade [4].

Materials and methods

The study was conducted in 2017 with 70 patients attending the Outpatient Clinic of the Department of Endocrinology who satisfied the

inclusion criteria were registered for the study after obtaining their consent. A detailed questionnaire was used to elicit symptoms of hypothyroidism. The patients were examined for signs of hypothyroidism. Special attention was given to the examination of the cardiovascular system to look for clinical features of pericardial effusion.

Inclusion criteria

- Newly diagnosed patients with elevated TSH and decreased T3 and T4.
- Age of the patients more than 18 years.

Exclusion criteria

- Patients already on treatment with Thyroxine.
- Patients with other known causes of pericardial effusion – tuberculosis, uremia, malignancy, irradiation, connective tissue disorders, acute febrile onset, trauma, myocardial infarction and cardiac surgery.

Blood was drawn for complete hemogram, lipid profile, and thyroid profile and sent to the Biochemistry Laboratory. An ECG, Chest X-ray and an Echocardiogram were obtained for all the patient's data were statistically analyzed using SPSS 2017 software.

Results

The age distribution of the patients ranged between 18 years and 60 years with a mean age of 33.97 years. The age distribution in the study group was as per **Table – 1**.

The prevalence of pericardial effusion in this study was 17% (**Graph – 1**). 12 out of the 70 hypothyroid patients showed evidence of pericardial effusion. Pericardial effusion was noted in 17 % of patients with 2D echo. It was always mild (on average anteriorly 0.5 cm and

posteriorly 0.4 cm) to moderate (anteriorly 0.7 cm and posteriorly 1.9 cm). Mild effusion was present in 90 % of patients. Moderate effusion was present in only one patient. Severe pericardial effusion or cardiac Tamponade was never observed. Left ventricular dysfunction in the form of global hypokinesia and reduced ejection fraction was present in one patient. In another patient, mild pericardial effusion was associated with mild septal hypertrophy and mild global hyperkinesia leading to mild left ventricular dysfunction. None of these patients had evidence of pericardial thickening.

Table – 1: Age group distribution among patients.

Age group (Years)	No. of patients	%
18-30	33	47
31-40	16	23
41-50	10	14
51-60	11	16

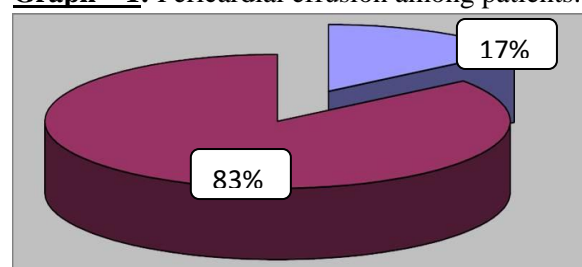
Table – 2: Common symptoms present among patients.

Symptom	No. of patients	%
Lethargy	50	71
Aches And Pains	29	41
Hair Loss	25	35
Weight Gain	45	64
Dry Skin	41	58
Cold Intolerance	28	40
Hoarseness of Voice	31	44
Swelling Around Eyes and Limbs	44	62
Anorexia	35	50
Dyspnea	9	12
Chest Pain	5	7
Constipation	32	45
Menstrual Disturbances	22	31
Memory Impairment	30	42
Tingling In Toes And Fingers	28	40

Lethargy and weight gain were the most common symptoms, which were present in 71% and 64% of the patients respectively. Dry skin and peri-orbital swelling were observed in 60% of the

patients. 12% had dyspnea and 44% had hoarseness of voice. 42% complained of memory impairment, constipation, and anorexia, cold intolerance, and distal paresthesias. Chest pain was present 7 % of patients, menstrual disturbances in the form of menorrhagia were observed in 42 %. Symptoms of hypothyroidism were distributed among the study group as per **Table – 2.**

Graph – 1: Pericardial effusion among patients.



Discussion

The pathophysiologic derangements responsible for the collection of fluid in the serous cavities of hypothyroid patients are probably increased systemic capillary permeability and disturbances in electrolyte metabolism. Alexander first used the term “Gold Paint Effusion” to describe the golden brown appearance of the pericardial fluid due to the shimmering satin cholesterol crystals. The high cholesterol content of the fluid has been attributed to disturbances in lipid metabolism; possibly, a churning action of the heart plays a role in the precipitation of cholesterol from pericardial fluid or the poor absorptive capacity of the pericardium may be a major factor [5]. Hypothyroidism, a disease with a multisystem involvement that may present clinically in various forms, one being unusual pericardial effusion, a cardiovascular complication. Early studies of overtly hypothyroid patients suggested that pericardial effusion was a relatively common phenomenon. More recent echocardiographic studies of the hypothyroid population show a widely varying incidence of pericardial effusion from 3 to 88 %. [6]. According to Jimenez-Nacher, et al., the incidence of pericardial effusion was 30 – 80 % in full blown of hypothyroid. However, these earlier studies were conducted when the diagnosis of hypothyroidism

was only suspected and was confirmed only in the presence of classic clinical features [7]. In contrast, the diagnosis has recently been established in the early mild stage or more often in an asymptomatic stage because of more frequent or routine determinations of thyroid function tests, especially in the elderly. Thus the subjects in the older studies were severely hypothyroid at the time of diagnosis and may not be representative of the present hypothyroid population. Due to earlier detection, the incidence has now fallen to 3% – 6% [8]. Rachid A, et al. studied 20 patients with hypothyroid cardiomyopathy. Pericardial effusion was demonstrated in 15 of the patients which disappeared with thyroxine therapy. In this study, 71% of the patients complained of generalized myalgia and lethargy. Other symptoms of hypothyroidism were found less commonly. But symptoms suggesting the involvement of cardiovascular systems like dyspnea on exertion and chest pain were found in only 14% of the patients [9]. Similarly, signs of pericardial effusion like muffled heart sounds and cardiomegaly were found only in 28% while signs of hypothyroidism like weight gain and pedal edema were found in around 64% of the patients. When analyzed statistically we did find a significant association between the presence of signs/ symptoms and occurrence of pericardial effusion [10].

Conclusion

Hypothyroidism at times has rare modes of presentation and on many occasions, it might go unrecognized. Hypothyroidism should be ruled out as an underlying cause of pericardial effusion, especially in the middle-aged females. The treatment is simple and gratifying, where the majority of the patients with mild effusion will get settled with thyroxine therapy alone and only patients with tamponade might need pericardiocentesis.

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