TO DETERMINE FREQUENCY OF CARDIOVASCULAR COMPLICATIONS IN PATIENTS WITH THYROID DISORDER PRESENTING AT DIVISIONAL HEAD QUARTERS HOSPITAL MIRPUR AZAD KASHMIR

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ABSTRACT

OBJECTIVE: To determine frequency of cardiovascular complications in patients with thyroid disorder presenting at Divisional Head Quarters Hospital Mirpur Azad Kashmir.

STUDY DESIGN: A descriptive study.

PLACE AND DURATION: This study was done at Kashmir Institute of Cardiology DHQ. Teaching Hospital Mirpur AJK, over 3 years from 1st January 2010 to 31st Dec 2012

METHODOLOGY: 103 consecutive patients with different Thyroid disorders were studied. Only lab confirmed patients whose Thyroid functions tests done were considered. All the values were computed using SPSS version 20. T3,T4 ,TSH were collected from each study participant .

RESULTS: Most of the patients were hyperthyroid .Tremors, palpitations, atrial fibrillation were observed as most common presenting symptoms followed by heart failure and dyspnoea. A high prevalence of Diabetes Mellitus and Ischemic heart diseases were also observed, similarly Atrial Fibrillation and heart failure were also observed particularly in admitted patients.

CONCLUSION: Thyroid disorders are important cause of cardiovascular morbidity and mortality. General public and patients diagnosed as thyroid disorders should know about cardiovascular complications of thyroid disorder through electronic and print media. Community awareness aggressive and early identification and management is needed to reduce morbidity and mortality.

KEY WORDS: Hyperthyroidism, Hypothyroidism, Clinical Presentation, Cardiac Diseases.

INTRODUCTION

Thyroid disorders are common, are known to be prevalent all over the world. Thyroid diseases are known to cause cardiovascular complications and even cardiovascular mortality. Recent data has suggested high non-cancer mortality with thyroid disorders as high as 20%. Extensive literature search was made to study the frequency of cardiovascular complications of thyroid diseases. We found lot of thyroid survey questionnaires about thyroid cancer, Grave's disease, thyroid nodule. [1-3] Similarly there are surveys about iodine and thyroid disease, ECG changes in thyroid disease, management of thyroid diseases, [4-7] "Although it is well known that hyperthyroidism can produce atrial fibrillation, it is less well recognized that hypothyroidism can predispose to ventricular dysrhythmias"[8]. A higher prevalence of cardiovascular symptoms and signs, as well as abnormal hemodynamic parameters, was noted among hyperthyroid patients at recruitment compared with control subjects [9]. Also there are other surveys available about different aspects of thyroid diseases and cancer [10-12]. Even subclinical thyroid disease is associated with increased mortality [13-16] There was high mortality in thyroid patients with heart failure.[17] Hyperthyroidism was shown to Have high mortality.[18-19] and complications involving hyperthyroidism and hypothyroidism, even sub clinical thyroid disorders have shown to increase cardio vascular mortality. That heart is sensitive to even minor alterations in thyroid hormones levels, and can lead to hemodynamic, rhythm disturbances, heart failures as in hyperthyroidism and dyslipidemia along with coronary artery disease are associated with hypothyroidism. Hyperthyroidism has known association with atrial arrhythmias and hypothyroidism has been found to be associated with prolonged QT interval and resultant ventricular tachycardia and uncommonly life threatening Torsade De Pointes. Thyroid disorders are very common in AJ&K therefore it was important to conduct a study for cardio vascular complications of thyroid disorders. There is common perception that goiter and thyroid diseases are usually only associated with iodine deficiency and cancer. Most of the patients don't know about possible cardio vascular complications and mortality related to thyroid disorders. "Rationale of the Study Knowledge regarding the mechanism by which thyroid hormone may induce HF is an important issue for both endocrinologists and cardiologists. This assessment of the mechanisms that may lead to HF in patients with thyroid dysfunction confirms the link between thyroid hormone and cardiovascular function. This, in turn, reinforces the importance of early detection and effective treatment of cardiac abnormalities in patients affected by thyroid disorders. Close cooperation between endocrinologists and cardiologists to identify the best treatment options is essential if we are to improve the prognosis of severe cardiac involvement in patients with overt and subclinical thyroid dysfunction.[20] "The most important finding of one study is that abnormal thyroid function, whether present at baseline or

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developing in follow-up, is a significant independent prognostic factor in patients with moderately symptomatic HF and EFs =35%"[21].

METHODOLOGY

This descriptive study was conducted from 1st January 2010 to 31st Dec 2012. Sample size estimation was done according to reported prevalence of thyroid disorders annually at DHQ Teaching hospital Mirpur, which is about 100 cases per year and only those cases were selected who came to cardiology outdoor and Indoor. This was a Prospective study.

Over 100 consecutive patients with different Thyroid disorders were studied. Inclusion criteria were both gender above age 25years outdoor patients who gave consent and only laboratory confirmed cases of both hyperthyroidism and hypothyroidism were considered. Exclusion Criteria were Pregnancy below the age of 25 years severe psychiatric disturbances and not given consent only laboratory confirmed patients. All the values were computed using SPSS version 20. Standard deviation and means were calculated for quantitative variables and frequencies for qualitative variables. Approval was taken from the Ethical Committee of the DHQ Teaching Hospital Mirpur Place of study: Kashmir institute of cardiology DHQ. Teaching Hospital Mirpur AJK. Machine used in our study was fully automated immunoassay analyser "AXSYM" from Abbott diagnostics USA. Methodology: MEIA (micro particle Enzyme immunoassay.

RESULTS

Most of the patients were females and middle aged and similarly most of the patients did not have Goiter. Most of the patients were hyperthyroid (TABLE-I). Tremors, palpitation, hypertension and atrial fibrillation were most common mode of presentation (TABLE - II), followed by heart failure, dyspnea, pulmonary hypertension and stroke respectively.

There were 81% female (n=81) and 19% male (n=19) patients . Age of the patients ranged from 25 to 85 years. d+_10.040. only thirty patients had goiter (30%).mean age was 54.68 years. (68%) patients had hyperthyroidisms. d+_8.034 and (32%) had hypothyroidism s.d+_1.03 3 (n=3) patients was lost during study. There were 7% (n=7) patients who were admitted for acute coronary syndrome. 34% (n=34) patients reported palpitation. 15 % (n=15) dyspnea, (46%)had tremors. Ten (10%) patient were admitted. 6% (n=6) patients Had pulmonary hypertension.23% (n-23)patients had diabetes mellitus,24% (n=24) had hypertension. none of the patients underwent coronary angiography 10% (n=10) had dyslipidemia and 8% (n=8)were found to be smoker in our study. 18% (n=18)had chest pain (Table - II). About 10% (n=10) patients had syncope. None of the patients knew exactly when thyroid function Tests should be performed again 5% (n=5) patients had undergone thyroid surgery. 10% (n=10) patients Developed heart failure were admitted and discharged afterwards. Twenty patients 20% (n=20) had atrial fibrillation .one patient had stroke and one patient died during treatment. Ten patients reported body swelling. 5% (n=5) patients were found to have chronic kidney disease. A high prevalence of Diabetes Mellitus and Ischemic heart diseases were also observed which may be an incidental finding, All the Patients in our study received treatment of both hyperthyroidism and hypothyroidism. Fortunately none of our patients developed prolonged QT interval or Ventricular Arrhythmias

TABLE-I: DISTRIBUTION OF THYROID PATIENTS BASED ON THYROID STATUS

THYROID STATUS	STANDARD DEVIATIONS
	10.040 ±
Hyperthyroid	68(%) 8.034 ± s.d (n=68)
Hypothyroid	32(%) 1.031 ± s.d (n=32)

TABLE-II: DIFFERENT CLINICAL PRESENTATIONS

Dyspnoea	7% (n=7)	Awareness	20% (n=20)
Acute Coronary Syndrome?	10% (n=10)	Palpitation	34%(n=34)
Tremors	46% (n=46)	Dyslipidaemia	10%(n=10)
Diabetes	24% (n=24)	Heart Failure	10%(n=10)
Pulmonary hypertension	6% (n=6)	Atrial Fibrillation	20%(n=20)
Hypertension	23% (n=23)	Stroke	1%(n=1)

DISCUSSION

To our knowledge this is first study to determine the frequency of cardiovascular complications of thyroid disorders from Azad Kashmir. A very important observation based on the results of our study was high frequency of acute coronary syndrome and precipitating etiological risk factors like hypertension, diabetes. Similarly the spectrum of the cardiovascular disease ranged from palpitation, dyspnea to more serious arrhythmias like atrial fibrillation, heart failure and complications like stroke various cardiovascular complications of different thyroid disorders were observed in our study ranging from symptomatic arrhythmias, IHD, acute coronary syndrome, heart failure, pulmonary hypertension, hypertension and dyslipidemia. Diseases using a detailed questionnaire with. Thyroid diseases are important causes of cardiac risk, morbidity and mortality[22]. There are lot of studies to suggest increased cardiovascular mortality with Thyroid disorders [23]. Traditionally, in our society thyroid disorders are considered to be associated with iodine deficiency and thyroid cancer, the emphasis on cardiovascular risk and long term mortality is very less and needs to be improved due to high mortality in untreated patients according to recent data. Hypothyroidism is also associated with cardiovascular mortality[24-25] recent data has also suggested

mortality due to stroke and atrial fibrillation[26-27] Thyroid disorders particularly hyperthyroidism can lead to hypercoagul ability.[28] Thyroid dysfunction can affect cardiovascular system in dialysis patients[29] original local data from Pakistan also showed cardiovascular diseases. This data published in Pakistani journal concluded that adverse effect of thyroid malfunction on myocardium and vascular organs are through the direct role of thyroid hormone and dyslipidemia on heart muscle cells at nuclear level and vascular system, respectively. It seems many cardiovascular disorders initially would not have been occurred in the first place if the thyroid of affected person had functioned properly, therefore thyroid function tests should be one of a prior laboratory examinations in cardiovascular disorders.[30]

"We used data from the Third National Health and Nutrition Examination Survey (NHANES III), a cross-sectional study conducted between 1988 and 1994 that used a multistage stratified clustered probability design to select a representative sample of the civilian non-institutionalized US population This analysis of NHANES III men and women with thyroid hormone levels within the normal range showed a positive linear association between serum T4 levels and heart rate in men and a U-shaped association between T4 levels and PR interval in men and women[7]".This study highlights various risk factors associated with coronary artery disease and thyroid disorders Hypothyroidism has also shown to increase cardiovascular mortality[31-32]. Several studies have shown a significant association which links metabolic syndrome with subclinical and overt hypothyroidism and the association seems to be more in females.[31-32] Our study clearly showed very little awareness about symptoms and cardiovascular complications arising from thyroid disorders in general public.

The relationship of thyroid hormonal abnormalities and cardiovascular disease goes well beyond the risk of atherosclerosis in association with hypothyroidism and the risk of atrial fibrillation in individuals with hyperthyroidism the organ systems are intimately linked by their embryological anlage the initial descent of the thyroid gland follows the primitive heart and occurs anterior to the pharyngeal gut. The foundation of a subsequent development, and the ubiquitous effects of thyroid hormone are on the major components of the entire circulatory system: the heart, the blood vessels, and the blood Thyroid hormone affects virtually every anatomic and physiologic component of the cardiovascular system. In the presence of heart disease, pericardial disease, heart failure, or arrhythmias, overt or subclinical thyroid dysfunction merits a high level of clinical suspicion. Commonly related to abnormal thyroid function, numerous other cardiac conditions also have been related to thyroid dysfunction. These include pericarditis, pericardial effusion cardiac tymponade, sinus bradycardia and tachycardia, atrioventricular block, torsade de pointes ventricular tachycardia, typically with a long QTc; left ventricular systolic and diastolic dysfunction, heart failure, high output congestive state, cardiomyopathy, mitral valve prolapse (in particular with autoimmune thyroid gland disorders), endothelial dysfunction, dyslipidemia, and both systolic and diastolic hypertension. Hyperthyroidism may complicate or cause preexisting cardiac disease because of increased myocardial oxygen demand and increased contractility and heart rate, and may cause silent coronary artery disease, anginas or compensated heart failure and even endothelial dysfunction[25]

CONCLUSIONS

General public and patients diagnosed as thyroid disorders are found to have cardiovascular complications of thyroid disorder through electronic and print media. Community awareness aggressive and early identification and management is needed to reduce morbidity and mortality.

STUDY LIMITATIONS

Due to financial constraints we were unable to get thyroid antibody test performed also the average thyroid function tests costed fifteen hundred rupees.

RECOMMENDATIONS

All the patients with thyroid disorders should be counselled for cardiovascular risks involved with thyroid disorders and must be evaluated for involvement of cardiovascular system.

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