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Original Research Article

To find out correlation between clinical signs and symptoms with the biochemical evidence of thyroid dysfunction in the diabetic patients

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Abstract:
Background & Method: The aim of the study is to find out correlation between clinical signs and symptoms with the biochemical evidence of thyroid dysfunction in the diabetic patients. A randomly selected population of all the known or recently diagnosed diabetic patients, attending the OPD or hospitalized as described, were subjected to a designated questionnaire, and followed by a detailed physical examination.
Result: In Hyperthyroid group, 100% (n=2) of patients had both deranged FBS and PPBS. In subclinical Hypothyroid group, 14.29% (n=1) had blood sugar level below designated normal level by ADA,14.29%(n=1) had deranged FBS and 71.42% (n=60) of patients had both deranged FBS and PPBS.
In subclinical Hyperthyroid group, 20.00% (n=1) had blood sugar level below designated normal level by ADA and 80% (n=4) of patients had both deranged FBS and PPBS.
Conclusion: The management of subclinical hypothyroidism with institution of therapy as soon as possible; and close monitoring of subclinical hyperthyroidism with institution of therapy if needed, we feel that it would be justified to undertake a positive approach towards screening all diabetic patients for thyroid diseases. Hence, if only those patients who present with specific signs and symptoms suggestive of thyroid illness were screened, we would miss the subclinical patients.

Keywords: clinical, symptoms, biochemical thyroid & diabetic.

Study Designed: Prospective Observational Study.

1. Introduction

Diabetes mellitus is one of the modern pandemics. It is estimated to affect 380 million people by the year 2025[1]. It is one of those diseases that cannot be cured, but can only be controlled so as to prevent its long-term microvascular and macrovascular complications.
Diseases of the thyroid gland are also amongst the most abundant endocrine disorders in the world, second only to diabetes[2]. Hyperthyroidism and hypothyroidism occur in about 2% and 1% of the population respectively[2]. However, in endemic zones, goiter due to dietary iodine

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deficiency can occur in up to 15% of the population[2]. Most reports estimate that the prevalence of thyroid dysfunctions in this part of the world is higher than values elsewhere in the world[2,3]. Many attribute it to the iodine intake and many to the genetic make-up of the population[2,3].

Thyroid disease is common in the general population[8] and modern assays provide a reliable and inexpensive method of assessing thyroid function. Screening for thyroid dysfunction is justified in specific patient groups such as neonates and the elderly and a case can be made to extend screening to other groups such as diabetic patients, who have a higher prevalence of thyroid disease than the background population. Although screening for thyroid diseases in diabetic patients at initial diagnosis may identify a significant pool of previously undiagnosed thyroid disease[9,10] the yield from annual screening, which has been recommended by some authors[14,15], had not been evaluated in large out-patient diabetic clinics till 1995 by Perros and coworkers[4].

Hence, it will be safe to assume that in India we would be able to find a higher percentage of patients with thyroid diseases among the diabetics than that present in the general population which may or may not be part of the polyglandular syndromes. The aim of the present study is to assess the prevalence of thyroid dysfunction in diabetic population screened over a period of approximately 1 year.

2. Material & Method

A randomly selected population of all the known or recently diagnosed diabetic patients, attending the OPD or hospitalized as described, were subjected to a designated questionnaire, and followed by a detailed physical examination. The TSH level, T4, T3, fT3, fT4, serum cholesterol levels and recent blood sugar levels were measured along with other routine laboratory investigations like complete blood count, urea, creatinine, urine analysis, chest X-ray and electrocardiography.

Sample collection was done by convenient sampling in which the patients attending the respective departments were chosen as per convenience after taking proper informed consent. For the sampling:

Inclusion criteria:

- Patients attending Hospital with history of diabetes or were found to be diabetic on assessment at presentation.
- Patients admitted in Hospital with history of diabetes or were found to be diabetic on assessment at presentation.

Exclusion criteria:

- Patients who had undergone surgery on the thyroid gland.
- Patients who had undergone exposure to radiation of the thyroid gland.
- Patients of drug-induced hyperglycemia, e.g. high dose steroids, pentamidine,diazoxide, etc.

3. Results

TABLE 1: Demographic Profile

	T1DM 11(100%)	**T2DM 121(100%)**	**TOTAL STUDY POULATION**
MEAN AGE (Years)	28.18 ± 12.21	55.45 ± 10.54	53.18 ± 13.05

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MEAN DURATION OF DIABETES MELLITUS (Years)	6.46 ± 10.70	6.55 ± 6.19	6.55 ± 6.22
FAMILY HISTORY OF DIABETES MELLITUS	1(9.09%)	24(19.83%)	25(18.94%)

TABLE 2: Correlation of thyroid profile with the clinical presentation

Current presentation	**Euthyroi**	**Hypo thyroi d**	**Hyper thyroi d**	**Sub clinical hypo thyroid**	**Sub clinical hyper thyroid**	**T3 toxic osis**	**NTI**	**T0TAL**
On regular treatment	68	6	1	6	3		1	85
On irregular treatment	26		1	1	1	1		30
On no treatment	3							3
Newly diagnosed DM	10	3			1			14
DKA	6		1		1	1		9
NKHC	1							1
On medication but had some complaints	14	4	1	3		1	1	24

TABLE 3: Correlation of thyroid profile with the blood sugar level

Thyroid profile	**FBS < 7, PPBS <11.1**	**FBS > 7, PPBS <11.1**	**FBS < 7, PPBS >11.1**	**FBS > 7, PPBS >11.1**	**TOTAL**
Euthyroid	23	13	11	60	107
Hypothyroid	02	00	01	06	09
Hyperthyroid	00	00	00	02	02
Subclinical hypothyroid	01	01	00	05	07
Subclinical hyperthyroid	01	00	00	04	05
T3 toxicosis	00	00	00	01	01
Non thyroid illness	00	00	00	01	01

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TOTAL	27	14	12	79	132

FBS and PPBS values expressed in mmol/L

In euthyroid group, 21.50% (n=2) had blood sugar level below designated normal level by ADA,12.15%(n=13) had deranged FBS,10.28%(n=11) had deranged PPBS and 56.07% (n=60) of patients had both deranged FBS and PPBS.

In Hypothyroid group, 22.22% (n=2) had blood sugar level below designated normal level by ADA,11.11%(n=1) had deranged PPBS and 66.67% (n=6) of patients had both deranged FBS and PPBS.

In Hyperthyroid group,100%(n=2) of patients had both deranged FBS and PPBS.

In subclinical Hypothyroid group,14.29%(n=1) had blood sugar level below designated normal level by ADA,14.29%(n=1) had deranged FBS and 71.42% (n=60) of patients had both deranged FBS and PPBS.

In subclinical Hyperthyroid group, 20.00% (n=1) had blood sugar level below designated normal level by ADA and 80% (n=4) of patients had both deranged FBS and PPBS.

4. Discussion

In our study, hyperthyroidism was the most prevalent disorder in T1DM patients, occurring in up to 18.18% of the total T1DM population [9.09% were having primary hyperthyroidism and 9.09% were having T3 toxicosis syndromes]. Males and females are equally affected (Both 9.09%). In T2DM patients, primary hypothyroidism was the most prevalent disorder, occurring in up to 7.44% of the total diabetic population, followed by subclinical hypothyroidism in 5.79%, subclinical hyperthyroidism in 4.13%, hyperthyroidism in 0.83%, and nonthyroid dysfunction in 0.83% patients. Out of these, the prevalence of hypothyroidism in the male population was 8% (4/50), subclinical hypothyroidism 4% (2/50), subclinical hyperthyroidism as 4% (2/50) and patients suffering from nonthyroid illness as 2% (1/50). The values in female population were as follows: the prevalence of hypothyroidism was 7.04% (5/71) that of subclinical hypothyroidism was 7.04% (5/71), hyperthyroidism 1.40% (1/71) and subclinical hyperthyroidism was 4.22% (3/71).

Another aspect of our study is that we found that most of the clinical findings of thyroid dysfunction were not very sensitive of the diseases for which they were being utilized. This corroborates with a study done by Safeeq A[10] where the researchers also found that the clinical manifestations of thyroid diseases were not at all sensitive (with most findings below 50%) but were quite specific with specificity ranging to above 90% with weight gain, menstrual disturbances, hoarseness and depression being the most specific symptoms and edema and delayed relaxation of ankle reflex being the most specific findings in hypothyroidism.

The clinical profile of hypothyroid patients in the general population, presenting to primary care has been done by Schectman et al[11]. Among those presenting with common complaints of hypothyroidism like: constipation, menorrhagia, fatigue, cold intolerance depression, etc. the yield of hypothyroidism was 4% and only 2% had TSH level above the normal limit of 5.0Mu/L. However, as shown by Billewicz et al[12] the more specific complaints included slowness of movement, coarse skin, decreased sweating, hoarseness, paraesthesia, cold intolerance, periorbital edema, and delayed ankle reflex[13].

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5. Conclusion

The management of subclinical hypothyroidism with institution of therapy as soon as possible; and close monitoring of subclinical hyperthyroidism with institution of therapy if needed, we feel that it would be justified to undertake a positive approach towards screening all diabetic patients for thyroid diseases. Hence, if only those patients who present with specific signs and symptoms suggestive of thyroid illness were screened, we would miss the subclinical patients.

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