

Evaluation of Thyroid Functions in Chronic Obstructive Pulmonary Disease

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Abstract: COPD being a systemic disease, is frequently associated with alteration of systemic functions. This study was designed to determine the thyroid functions in COPD patients during the acute exacerbations and during the stable phase. This study was done to determine whether thyroid functions were significantly altered during exacerbation. We picked up 96 cases of acute exacerbations of COPD who came for treatment in our hospital and analysed their thyroid function (T3, T4, TSH) at the time of admission and after one month of admission (during follow up). We found that 62 patients have lower than normal thyroid functions, among whom the levels of T3, T4, and TSH were decreasing during the exacerbation stage and more significantly in above 60 years of age group and in those patients with diabetes mellitus. Of these 62 patients, 43 were followed up after one month to know the status of thyroid functions after recovery. It was found that the thyroid functions are being restored to normalcy during the stable followup stage in most of the cases. In Conclusions: The thyroid functions were at lower normal range in patients with COPD and even lower during the exacerbations. It was found that thyroid functions were lower more profoundly in older age group and diabetics.

Key words: COPD • Acute exacerbation • Thyroid functions

INTRODUCTION

Chronic obstructive pulmonary disease (COPD) is characterized by significant chronic inflammation not only in the pulmonary compartment but also in systemic circulation and this disorder is associated with clinically significant systemic alterations in biochemistry and organ functions [1, 2].

Several factors such as hypoxemia, exacerbation, drugs, malnutrition may lead to endocrinological changes in COPD, especially thyroid function abnormalities. The term Non Thyroidal Illness Syndrome (NTIS) and Euthyroid Sick Syndrome have been used to describe these abnormalities [3].

Evaluation of these abnormalities is necessary for diagnosis of thyroid disease since thyroid function abnormalities in NTIS may mimic or mask biochemical abnormalities observed in true thyroid disease. Besides the severity and nature of these alterations may be a prognostic indicator for the underlying disease.

In this study we evaluated thyroid abnormalities in patients with COPD exacerbation.

Aims and Objectives:

- To analyze the prevalence of thyroid dysfunction in Chronic Obstructive Pulmonary Disease exacerbation
- To monitor the thyroid function in such patients during the recovery period

MATERIALS AND METHODS

This prospective observational study was conducted in Sree Balaji Medical College & Hospital, Chennai. We evaluated a total of 96 patients who were admitted with acute exacerbation of COPD. The thyroid function tests (T3, T4, TSH) were done in all these patients at the time of admission and during the follow up (One month after admission).

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RESULTS

A total of 96 patients was evaluated. Among the 96 patients, 57 belonged to <60 yrs age and 39 belong to \geq 60 yrs age group.

We found that 64 patients have lower than normal thyroid functions, among whom the levels of T3, T4, TSH were decreasing further during the exacerbation stage. Of the 64 patients with abnormal thyroid function during the exacerbation stage, 36 (56.25%) belong to >60 years age group and 40(62.5%) patients were Diabetics.

Of the 62 patients with abnormal thyroid function during admission (Exacerbation), 43 were followed up after one month to know the status of thyroid functions after recovery (After one month of admission). Among the 43 patients, 35 patients had normal thyroid function tests in the follow up whereas the tests were still abnormal in 8 patients. All the 8 patients were found to be diabetics.

DISCUSSION

Non thyroidal illness syndrome may be regarded as an acute phase response and serves as one of the major mechanisms of the body to restore homeostasis in severe illness like COPD. Extensive investigation of the mechanisms leading to alterations in thyroid hormone metabolism seen in NTI has failed to identify a single factor responsible for the observed changes. It is likely that multiple factors determine this characteristic changes in thyroid hormone metabolism. In NTI there is evidence for interference of normal hypothalamic- pituitary-thyroid axis function as well as altered peripheral thyroid hormone transport and metabolism.

In the present study we evaluated 96 COPD patients with exacerbation of which 64 (67%) subjects have abnormal thyroid function. in the study done by *F.Karadag et al.* [4], 70% of COPD subjects with exacerbation had NTIS.

A total of 43 subjects were followed up and among these patients, 35 showed reversal to normality whereas 8 subjects still have low TFTs. *Zargar* [5] *et al.* showed inspite of clinical improvement T3 continued to remain lower after a month in a few subjects.

When we evaluated the relation between age and thyroid function, we found that thyroid function is less in older subjects. A study conducted by *Tognini et al.* [6] showed that there is a progressive reduction in thyroid function with increase in age.

We found that among the 64 patients with NTI at admission, 40 were diabetics. The repeat tests after one month showed that 8 subjects had abnormal TFTs and all were diabetics. *Naijie et al* [7] showed significant incidence of NTIS in subjects with Diabetes Mellitus and this altered TFTs were reverted back to normal only with several days of good diabetic control.

The thyroid functions were at lower normal range in patients with COPD during the exacerbations. It was found that thyroid functions were lower more profoundly in older age group and diabetics and such patients were requiring a longer time for recovery.

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