

Summary

Background

Hypothyroidism is a common endocrine disorder affecting multiple body organs. The respiratory system like other body systems and organs is affected by hypothyroidism. Previous studies demonstrate either a normal or restrictive type of pulmonary function test in hypothyroidism. Therefore, in this study the pulmonary function in adults with hypothyroidism and the effect of thyroxine on it were evaluated by spirometry.

Subjects and methods

The study was conducted during the period from November 2017 to July 2018 in Al-Faiha Specialized Diabetes, Endocrine and Metabolism Center (FDEMC) in Al-Faiha Teaching Hospital, Basrah, Iraq. The study included two parts:

A. **Comparative study:** Subjects in this part are divided into 4 groups:

1. Uncontrolled hypothyroid group (TSH >5mIU/L) consists of 72 hypothyroid patients receiving thyroxine therapy.
2. Controlled hypothyroid group (TSH=0.4-4mIU/L) consists of 60 hypothyroid patients receiving thyroxine therapy.
3. Newly diagnosed hypothyroid group (TSH> 5.5mIU/L and fT4< 0.89 ng/dl) consists of 52 newly diagnosed hypothyroid patients.
4. Control (euthyroid) group (TSH=0.4-4mIU/L and fT4= 0.9-1.7ng/dl) consists of 110 apparently healthy persons, age and sex matched with hypothyroid groups. Patients were collected from FDEMC, control subjects are either relatives of hypothyroid patients or staff of Basrah College of Pharmacy. Pulmonary function assessment by spirometry was done to all subjects.

B. Longitudinal study: 17 adults' newly diagnosed hypothyroid patients are included in this part of study. Reevaluation of pulmonary function by spirometry was done after 3 months of thyroxine therapy.

Results

A significantly low FVC, FVC%, FEV1 and FEV1% were noticed in hypothyroid groups, the reduction was more pronounced in uncontrolled hypothyroid group. While, FEV1/FVC was more in controlled hypothyroid group compared with control group. However, no significant difference in PEF, PEF%, FEF25-75 and FEF 25-75% were observed among the 4 groups. Moreover, abnormal pulmonary function test (PFT) was significantly more in hypothyroid patients and especially in uncontrolled hypothyroid group. The abnormality in PFT was mostly of restrictive type. A significantly negative correlation has been found between TSH and spirometric parameters, while the correlation of fT4 is significantly positive with both of FVC% and FEV%. A significant increase in FEV1 was observed after thyroxin therapy for three months; However, the increasing in other PFT parameters were insignificant. While, a significant number of patients with abnormal PFT were changed into normal pattern by thyroxine therapy.

Conclusion

In hypothyroidism, high TSH and low fT4 are recognized causes of a reduction in the parameters of PFT. Pulmonary function parameters are improved by thyroxin therapy. Therefore, spirometry can be used to detect pulmonary function changes of hypothyroidism and probably are reflection of systemic hypothyroid body changes so also to monitor the response to hormonal replacement therapy.