
*ASSESSMENT OF THYROID PROFILE AND AUTO
ANTIBODIES IN CHILDREN WITH ASTHMA AT AL-
HUSSEIN UNIVERSITY HOSPITAL*

By

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ABSTRACT

Background: *the most important causes of thyroid diseases is autoimmunity in origin, and it seems that people with thyroid diseases present more signs of asthma.*

Aim: *This study aimed to study the frequency of autoimmune thyroid diseases among patients suffering from bronchial asthma.*

Patients and Methods: *50 Egyptian children, with an age range of 2-12 years, 25 children of them were suffering from bronchial asthma and 25 healthy children as a control were included in this cross-sectional study. Asthmatic children were selected from the Allergy Clinic at Al-Hussain Hospital, Al-Azhar University. All participants were subjected to the following: full history taking, full clinical examination, and investigations including (Serum FT3, Serum FT4, Serum TSH, Serum anti TPO, Serum anti TG, Serum IgE & CBC for total Eosinophilic count).*

Results: *There were a high statically significant increase in Serum IgE level and total esinophilic count in cases compared to control with P value <0.01 but no statistical significant difference between different degrees of asthma. There were no statically significant difference in Serum thyroid hormones level and Serum auto-antibodies level in asthmatic patients when compared to controls (P >0.05).*

Conclusion: *This study show no significant thyroid affection in asthmatic children compared to studies done before.*

INTRODUCTION

Bronchial asthma is an important health issue, especially in developing countries, during the childhood period, bronchial asthma is often underdiagnosed and undertreated, which may lead

to severe psychosocial disturbances in the family (Kumar et al., 2015).

Autoimmune thyroid diseases (AITD) one of the most common autoimmune disorders. In the majority of individual cases the

clinical impact of AITD is not severe, however, their widespread diffusion renders them a significant health problem (Bagnasco et al., 2017). Also, little is known about the relation between thyroid disease and allergic diseases (Jenkins and Weetman, 2017).

Aim of the Study

This study aimed to study the frequency of autoimmune thyroid diseases among patients suffering from bronchial asthma.

Ethical Consideration

- Written Parent consent for the study was obtained before the study.
- Approval of the local ethical committee in the pediatrics department, college and university were obtained before the study.
- The authors declared no potential conflict of interest with respect to the research & publication of this article.
- All the data of the patient & results of the study are confidential & the patient has the right to keep it.
- The authors received no financial support for the research & publications of the article.

PATIENTS AND MATERIALS

This is case control study was conducted on 50 Egyptian children, with an age range of 2-12 years, 25 children of them were suffering from bronchial asthma and 25 healthy children as a control group. Asthmatic children were selected by random sample from the Allergy Clinic at Al-Hussain Hospital, Al-Azhar University from January 2019 to July 2019.

Inclusion criteria:

- Age: from 2-12 years.
- Severity: Mild to moderate persistent degree of asthma severity according to severity classification of Global Initiative for Asthma (GINA, 2018).
- Did not receive systemic corticosteroids or abstained from steroids 2 weeks before the study.

Exclusion criteria:

- Patients receiving regular therapy of inhaled steroids.
- Patients with chronic illness other than bronchial asthma.
- Patients with severe asthma.
- Asthmatic children with short stature whose height SDS (Standard Deviation Score) < 2 SDS.

Clinical Study:

This included complete history taking and physical examination, using the allergy out-patient clinic sheet.

Serum FT3 level, Serum FT4 level, Serum TSH level, Serum anti TPO level, Serum anti TG level, Serum IgE level & CBC for total Eosinophilic count (Hamberger and Yuninger, 2017).

Laboratory Investigations:

RESULTS

Table (1): Demographic data of the study groups

| | Case | | Control | |
|---|---------------|----|---------------|----|
| | No | % | No | % |
| <u>Sex</u> | | | | |
| Male | 17 | 68 | 17 | 68 |
| Female | 8 | 32 | 8 | 42 |
| <u>Residence</u> | | | | |
| Urban | 12 | 48 | 21 | 84 |
| Rural | 13 | 52 | 4 | 16 |
| <u>Age in years</u> (Mean \pm SD) | 4.5 \pm 2.4 | | 5.9 \pm 2.8 | |
| P value | 0.015 | | 0.015 | |

Table (1): shows that asthma prevalence was more common in males (17=68%) than females (8=32%) and age difference among the two study groups which reveals that mean age of

control group is greater than that of the case group with the presence of significant difference between case and control group ($p < 0.05$).

Table (2): Classification of asthma severity in patient group

| Grades of asthma | Frequency | Percent |
|---------------------|-----------|---------|
| Mild persistent | 10 | 40 |
| Moderate persistent | 15 | 60 |

Table (2): shows that classification of patients according to asthma severity; 10

patients (40%) have mild persistent degree and 15 patients (60%) have moderate persistent.

Table (3): Laboratory data in the study groups

| Type | | Mean ± SD | P-Value |
|------------------------------------|---------|----------------------|---------|
| IGE (UI/ml) | Case | 191.8000 ± 122.10890 | < 0.001 |
| | Control | 94.8600 ± 93.74061 | |
| Esinophils x10 ³ /μl | Case | 15.2800 ± 10.64296 | < 0.001 |
| | Control | 4.9088 ± 4.17173 | |
| FT3 (pg/ml) | Case | 1.4792 ± 1.31310 | 0.131 |
| | Control | 2.1796 ± 0.87520 | |
| FT4 (ng/ml) | Case | 1.2424 ± 0.31560 | 0.49 |
| | Control | 1.4588 ± 0.65850 | |
| TSH (IU) | Case | 3.5780 ± 2.86469 | 0.504 |
| | Control | 3.8220 ± 3.27382 | |
| AntiTPO (IU/mL) | Case | 7.7408 ± 4.28441 | 0.345 |
| | Control | 7.2020 ± 3.09023 | |
| AntiTG (IU/mL) | Case | 15.5620 ± 5.05114 | 0.307 |
| | Control | 18.0164 ± 8.18120 | |

*IgE: Immunoglobulin E. *E: Eosinophilic count. *FT3: Free triiodothyronin *FT4: Free thyroxin. *TSH: Thyroid stimulating hormone.

*Anti-TPO: Anti thyroid peroxidase *Anti-TG: Anti thyroglobulin.

There is a significant difference between case and control regarding the level of IgE and Eosinophilic count (p<0.001) while no significant

difference between case and control were found as regards FT3, FT4, TSH, Anti-TPO and Anti-TG antibodies.

Table (4): Laboratory data among different degrees of asthma

| Type | | Mean \pm SD | P-Value |
|---|----------|--------------------------|---------|
| IGE (UI/ml) | mild | 192.3600 \pm 126.07203 | 0.385 |
| | moderate | 253.5400 \pm 143.96208 | |
| Esinophils $\times 10^3/\mu\text{l}$ | mild | 12.8512 \pm 3.21666 | 0.568 |
| | moderate | 12.8536 \pm 9.52821 | |
| FT3 (pg/ml) | mild | 1.7320 \pm 1.19792 | 0.537 |
| | moderate | 1.4892 \pm 1.12198 | |
| FT4 (ng/ml) | mild | 1.0000 \pm .00000 | 0.163 |
| | moderate | 1.2768 \pm .37826 | |
| TSH (IU) | mild | 3.7800 \pm 3.04412 | 0.62 |
| | moderate | 3.7052 \pm 2.30955 | |
| AntiTPO IU/mL | mild | 5.6080 \pm 1.44809 | 0.241 |
| | moderate | 7.5524 \pm 3.98994 | |
| AntiTG IU/mL | mild | 14.7232 \pm 2.44332 | 0.079 |
| | moderate | 15.0808 \pm 4.23128 | |

*IgE: Immunoglobulin E. *E: Eosinophilic count. *FT3: Free triiodothyronin *FT4: Free thyroxin. *TSH: Thyroid stimulating hormone.

*Anti-TPO: Anti thyroid peroxidase *Anti-TG: Anti thyroglobulin.

No significant difference in lab data between the two groups of asthma as regards whole items ($p > 0.05$).

Table (5): Correlation between asthma severity and laboratory data of patient group

| Correlation | r-value | P-value |
|----------------|---------|---------|
| Degree and TPO | 0.139 | 0.394 |
| Degree and TG | 0.164 | 0.311 |
| Degree and IgE | 0.117 | 0.472 |
| Degree and E | -0.228 | 0.157 |

* Anti-TPO: Anti thyroid peroxidase.

*Anti-TG: Anti thyroglobulin.

*IgE: Immunoglobulin E.

*E: Eosinophilic count.

No significant correlation between degree of asthma on one hand and Anti-TG, Anti-TPO, IgE and eosinophilic count on the other hand ($P > 0.05$).

DISCUSSION

In the present study, there was a significant statistical difference between the serum total IgE level of control and patients with bronchial asthma ($p < 0.001$) (**Table 3**). However, no significant difference of the serum total IgE level could be identified between the various degrees of asthma severity (**Table 4**). These results are in agreement to the study done by **Satwany et al. (2009)** who concluded that total serum IgE level is a strong predictor of allergy in asthmatic children.

The results of our study showed that the total eosinophilic count is significantly increased in asthma cases compared to control group with P value <0.001 (**Table 3**). However, no significant difference of the eosinophilic count could be identified between the various degrees of asthma severity (**Table 4**). In this regard, **Rabie et al. (2008)** reported a significantly higher blood eosinophilic percentage in asthma patients than in normal subjects but in contrast to our study the authors showed significant increase in percent eosinophils with increasing degrees of asthma severity.

In the present study no significant association was found between thyroid function disorders

and bronchial asthma ($p>0.05$) (**Table 3**). These results were in agreement with findings of **EL Aziz and colleagues (2012)** who studied 40 patients (including 20 bronchial asthma and 20 allergic rhinitis patients) in whom thyroid function tests (TSH, FT4, FT3) were not found to be statistically different between test and control groups. Also our results are consistent with the study of **Lindberg et al (2004)** in which 140 children with different kinds of allergic diseases and 370 aged between 11-13-y-old schoolchildren without allergic diseases serving as controls who found that no association was found between TSH, T3 and T4 and bronchial asthma.

Our study demonstrated no association between anti-TPO Ab and anti-TG Ab on one hand and bronchial asthma on the other hand ($p>0.05$) (**Table 3**). These results were in contrast with **Lindberg and colleagues (2004)** and **Amino and colleagues (2003)** who described an increased incidence of thyroid auto-antibodies in patients with bronchial asthma and/or allergic rhinitis.

CONCLUSION

The present case - control study aimed to determine the serum thyroid hormones level and auto-

antibodies in mild and moderate persistent asthma in children, comparing them to a matching group of healthy children.

The study concluded the following:

1. Serum thyroid hormones level was not significantly affected in asthma patients when compared to controls ($P > 0.05$).
2. Serum auto-antibodies level was not significantly affected in asthma patients when compared to controls ($p > 0.05$).
3. Serum IgE level show significant increase in cases compared to control with P value < 0.001 but no statistical significant difference between different degrees of asthma.
4. Total eosinophilic count show statistical significant increase in cases compared to control with P value < 0.001 but no significant difference between different degrees of asthma.

RECOMMENDATION

- The results of this study suggest that thyroid autoimmune processes and also thyroid hormones level not affected by asthma. We recommend larger studies for further evaluation.
- According to study results it is also recommended to study all degrees of asthma severity not

only mild and moderate degree (severe and intermittent).

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تقييم ملامح الغدة الدرقية والأجسام المضادة في الأطفال المصريين المصابين بالربو بمستشفى الحسين الجامعي

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الوكيل*

يعتبر الربو الشعبي من أكثر الأمراض المزمنة انتشارا
و يكون مصحوبا بضيق جزئى أو كلي فى الشعب الهوائية
نتيجة للالتهاب الحادث فيها مما يؤدي الى صعوبة فى التنفس
و أزيز بالصدر و كحة تكون ملحوظة بشدة فى المساء و فى
الصباح الباكر.

لذلك يتوجب دراسة احتمالية وجود أمراض أخرى
تكون مصاحبة له؛ لذلك قمنا بدراسة علاقه بينه و بين مرض
من الأمراض الناتجة عن خلل بالجهاز المناعى المسبب
لامراض الربو الشعبي و هرمونات الغدة الدرقية والأجسام
المضادة لها حيث ان بعض الدراسات افترضت أنه توجد
علاقة بين الربو الشعبي و هرمونات الغدة الدرقية والأجسام
المضادة لها.

وقد كانت نتيجة البحث عدم وجود علاقة بين الربو
الشعبى و هرمونات الغدة الدرقية والأجسام المضادة لها حيث
انه لم يوجد فارق فعال بين مجموعة المرضى و المجموعة
الضابطة و لم يكن له دلالة احصائية .

أجريت هذه الدراسة فى مستشفى الحسين الجامعي في العام 2018-2019 و قد ضمت هذه الدراسة 25 طفلا مصابون بنوبات ربو شعبى بالإضافة الى 25 طفلا صحيحا و متوافقا كمجموعة ضابطة.

و قد تم اجراء فحص اكلينيكي شامل لكل الحالات بالإضافة الى فحوصات اخرى و هى : صورته دم كامله و مستوى هرمونات الغدة الدرقية و الأجسام المضادة لها.

أسفرت هذه الدراسة إلى النتائج التالية:

1- تبين أن تركيز هرمونات الغدة الدرقية لم يكن مرتفعا بدرجة ذات دلالة احصائية في المرضى مقارنة بالمجموعة الضابطة (القيمة الاحتماليه > 0.05).

2- تبين ايضا ان تركيزنسبة الاجسام المضادة لم يكن مرتفعا بدرجة ذات دلالة احصائية في المرضى مقارنة بالمجموعة الضابطة (القيمة الاحتماليه > 0.05).

3- ارتفاع نسبة الجسم المضاد E بدرجة ذات دلالة احصائية في المرضى مقارنة بالمجموعة الضابطة (القيمة الاحتماليه < 0.001).