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Evaluation of Serum Annexin A1 Level in Children with Bronchial Asthma and its Relation to Disease Severity

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Abstract

Background:*Bronchial asthma (BA) is a highly prevalent disease. Asthma is considered a multifactorial disorder that results from interaction between multiple genetic and environmental factors, the main pathology in asthma is chronic inflammation in the air way****.*** *Annexin A1 (ANXA1) is a glucocorticoid-induced protein with multiple functions in the regulation of inflammatory cell activation. The aim of this work was to evaluate Annexin A1 levels in the blood of asthmatic patients.****Methods:****This is a case-control study was performed for one year duration in the period from September 2018 to August 2019.This study carried out at Pediatric Department at Zagazig University Hospitals. This study included 100 children that were divided into 2 groups: Cases group (80 asthmatic children). Control group (20 age and sex matched healthy children). All patients in the study were subjected to: history, examination and Laboratory investigations (Serum Annexin A1 level)****Results:****Bronchial asthma was more common and severe in urban than rural residence. Parent consanguinity was significantly associated with risk factors for asthma. There is a statistically significant higher annexin A1 among cases than control group.****Conclusion:*** *Serum annexin A1 was higher in asthmatic children than controls.*

Key words: *Annexin A1 levels- asthmatic patients–evaluation.*

I. Introduction:

Asthma is a chronic disease of childhood and adolescence characterized by reversible airway obstruction resulting from an underlying chronic inflammatory process that typically involves infiltration of various cell types **(1).**

Asthma, one of the most prevalent chronic childhood conditions which is the most frequent cause of hospitalization among children **(2).**

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Annexin A1 (ANXA1) is a glucocorticoid-induced protein with multiple functions in the regulation of inflammatory cell activation. The protein has been reported to have anti-phospholipase activity following glucocorticoid induction and possesses a wide range of physiological and pathological functions [(3)].

The biological effects of ANXA1 differ based on intra- versus extracellular localization [(4)].

ANXA1 has anti-inflammatory effects by stimulating inflammatory cell programmed cell death and prohibiting eicosanoid synthesis [(5)].

The objectives of this study was to evaluate Annexin A1 levels in the blood of asthmatic patients.

II. Patients and Methods

This is a case-control study was performed for one year duration in the period from September 2018 to August 2019.

This study carried out at Pediatric Department at Zagazig University Hospitals.

Study population:

This study included 100 children that were divided into 2 groups:

- Cases group (80 asthmatic children)
- Control group (20 age and sex matched healthy children)

Inclusion criteria

All patients(5-14years old)presented by wheezy chest and diagnosed as bronchial asthma by history, clinical picture and investigated by lab tests and chest x-ray.

All patients in the study were subjected to:

1) History
2) Full general examination
3) Laboratory investigations

↳ ***Serum Annexin A1 level*** *:* using ANXA1 levels were also measured using ELISA kits acquiredfrom USCNK (Life Science Inc., PR China)

Statistical analysis

Data were fed to the computer and analyzed using IBM SPSS software package version 22.0. Qualitative data were described using number and percent. Quantitative data were described using median (minimum and maximum) for non-parametric data and mean, standard deviation for parametric data after testing normality using Kolmogrov-Smirnov test. Significance of the obtained results was judged at the (0.05) level.

III. Results:

Table (1) shows that there is statistically significant difference between studied groups regarding consanguinity& family history of smoking &history of allergy.There is no statistically significant difference between studied groups regarding their age, sex and residence.

Table (2) and Figure (1)illustrate that there is a statistically significant higher median annexin A1 among cases than control group (3.3 &2.6, respectively).

Table(1):Demographic characteristicsand history distribution among studied groups:

	Control group N=20(%)	**Intermittent group N=20(%)**	**Mild group N=20(%)**	**Moderate group N=20(%)**	**Severe group N=20%)**	**Test of significance**
Age/years Mean±SD	7.58±2.68	8.27±2.62	7.23±2.37	8.58±2.34	8.88±1.85	F=1.66 P=0.17
Sex Male Female	15(75.0) 5(25.0)	11(55.0) 9(45.0)	16(80.0) 4(20.0)	18(90.0) 2(20.0)	17(85.0) 3(15.0)	MC P=0.8
Residence Urban Rural	14(70.0) 6(30.0)	16(80.0) 4(20.0)	14(70.0) 6(30.0)	15(75.0) 5(25.0)	15(75.0) 5(25.0)	χ^2=0.73 P=0.95
Consanguinity	4(20.0)	14(70.0)	12(60.0)	14(70.0)	14(70.0)	χ^2=15.44 P=0.004*
Family history of smoking	6(30.0)	13(65.0)	13(65.0)	15(75.0)	12(60.0)	χ^2=9.67 P=0.046*
Family history of allergy	16(80.0)	3(15.0)	8(40.0)	6(30.0)	5(25.0)	MC P<0.001*

F:One Way ANOVA test MC: Monte-Carlo test χ^2:Chi-Square test

* Statistically significant (p<0.05)

Table (2): Annexin A1 distribution among studied groups:

	Control group	Cases group	Test of significance
Annexin A(ng/ml) Median (min-max)	2.6(1.8-6.7)	3.3(2.2-10.6)	z=2.87 p=0.004*

Z:Mann Whitney U test * statistically significant

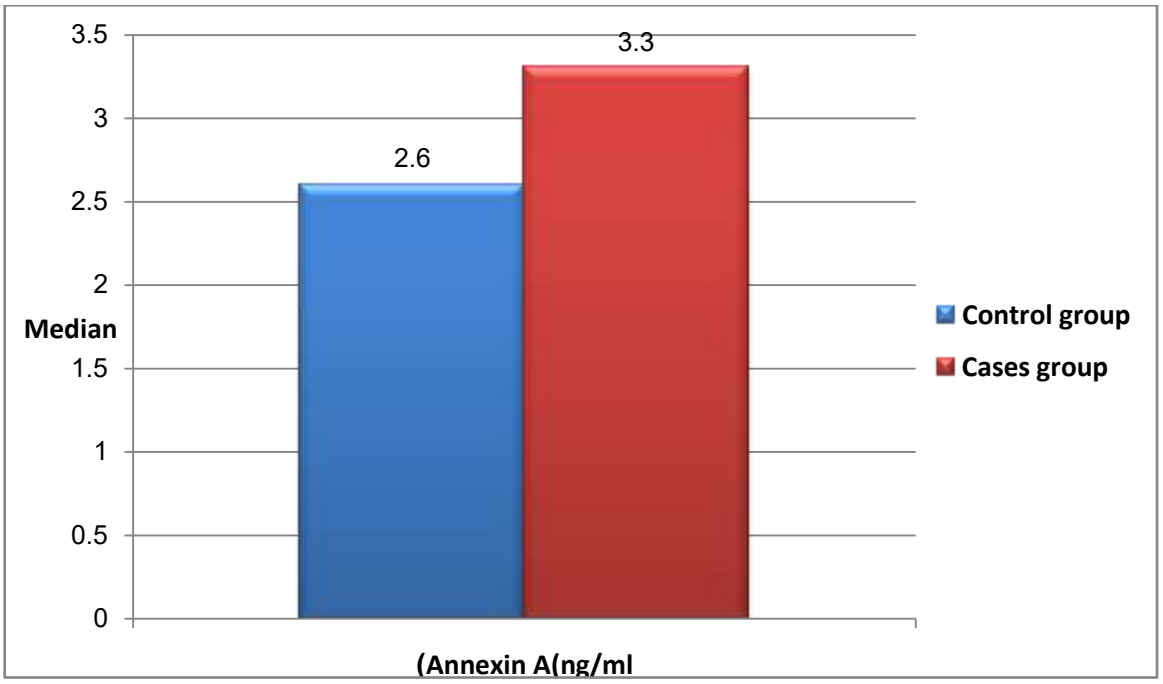

Figure (1):Annexin A1 distribution among studied groups

IV. Discussion

Our study showed that, there was no statistically significant difference between the control group and asthmatic group regarding age and sex.

This agreed with the results of **Lee et al.** [5] who found no statistically significant difference between the cases and controls regarding the age and sex.

Our study showed that, family Smoking was reported statistically significant higher among the asthmatic children than controls. This means that exposure to tobacco smoke is one of the most consistent risk factors in the development and exacerbation of asthma. This result is in accordance with **Vargas et al.,** [6] who found that environmental tobacco smoke exposure has been associated with the increased use of the emergency department for acute asthma care.

These results are in agreement also with **Abdel Salam et al.,**[7] who found that children exposed to the smoking at home or staging in the same place with a smoker are at a higher risk of asthma.

Our study showed that, there is a statistically significant higher annexin A1 among cases than control group (3.3ng/ml &2.6 ng/ml, respectively).

This agreed with **Lee et al.,** [5] who aimed to identify the role of ANXA1 in bronchial asthma. They found that plasma ANXA1 levels were increased in asthmatic patients compared with healthy controls.

This is similar to **Eke Gungor et al.,** [8] who reported that ANXA1 has compensatory anti-inflammatory effects in asthma.

This was totally in contrast to the results reported by Gungor and his colleagues where ANXA1 levels were compared between children with wheezing and controls, they were found to be markedly lower in the wheezing group (14.45 ± 3.26 ng/ml) than in the control group (16.40 ± 1.94 ng/ml)[9].

Two studies reported that reduced endogenous ANXA1 biosynthetic capability may be one of the reasons for airway inflammation in wheezy infants. According to them they reported the decreased ANXA1 level was due to interaction between LXA4 and ANXA1 [10; 9].

V. Conclusion:

Serum annexin A1 was higher in asthmatic children than controls

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