The potential anti-inflammatory role of adiponectin in developing allergic asthma

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Introduction

The incidence of asthma and obesity is increasing worldwide. There is a lot of research focused on connection between these two inflammatory conditions leading to the study of adiponectin, hormone secreted by the adipose tissue, due to its anti-inflammatory action (Ali and Ulrik, 2013). Systemic inflammation in obesity could up-regulate the asthmatic pathway, and this is modified by the adipokines and other systemic inflammatory markers like: C-reactive protein (CRP) and interleukin 6 (IL-6).

The purpose of the study

This study summarizes the role of adiponectin, as biomarker for pathological obesity, in the processes of developing allergic asthma.

Correlation of adiponectin with inflammatory marker protein CRP, IL-6, is assesses in order to determine the relation of pathological obesity with allergic asthma.

Materials

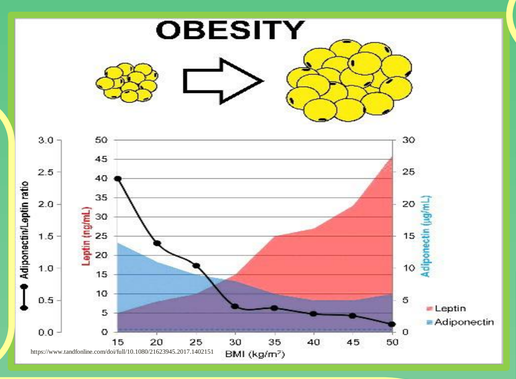
The study involved 90 people, of which 50 patients with asthma and 40 healthy controls subjects. The protocol of the study was according to Helsinki Declaration on Medical Research on Humans.

Methods

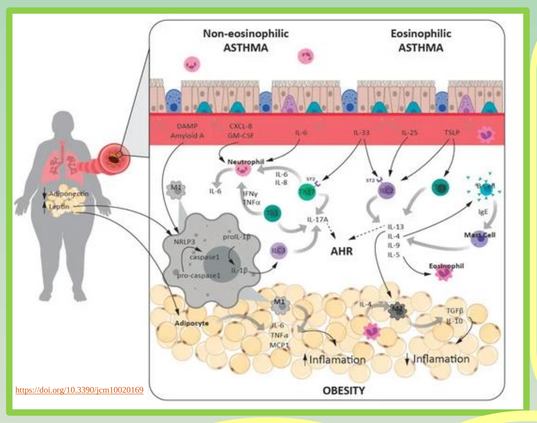
Serum sIgE was detected with immunoblotting test on nitrocellulose membrane coated with 20 selected allergens using RIDA qline allergy kit. Measurement of adiponectin serum level was done by ELISA. Serum levels of hsCRP were determined with immunoturbidimetric method. Serum levels of IL-6 were determined with ECLIA

Results and discussion

The patient and control group were divided into two subgroups using BMI classification in order to see if adiponectin as marker for obesity is involved in allergy asthma.



In our study, serum level of IL-6 was found to be significantly elevated in obese versus normal-weight individuals whether asthmatic or control. Chronic inflammation in adipose tissue, that produces inflammatory markers like IL-6, is considered a crucial risk factor that contributes to low grade systemic inflammation (Cheng et al., 2012). hsCRP was found to be significantly higher in asthmatic obese group than the other 3 groups (asthmatic lean, control lean and control obese) and it was found to be significantly higher in the asthmatic lean when compared with the lean controls. Serum level of adiponectin was significantly elevated in normal-weight individuals versus asthmatic obese group and control obese, the differences compared with asthmatic lean were not significant.



Thus, obesity may be a contributor to inflammation, because adiponectin as anti-inflammatory protein is decreased (Sood at al., 2011). There were positive correlations between circulating levels of IL-6 and CRP with BMI, while serum adiponectin level showed negative correlation.

Table 1. Comparison of biochemical parameters of the studied population

		hsCRP (mg/L)		IL 6 (pg/ml)		Adiponectin (µg/ml)	
		Mean difference	P	Mean difference	P	Mean difference	P
Asthmatic lean	Asthmatic obese	-6,560	<0,01	-2,788	<0,01	0,665	0,033
	Control lean	0,685	0,156	0,369	0,258	-1,909	0,558
	Control obese	0,005	0,992	-2,306	<0,01	1,560	<0,01
Asthmatic obese	Control lean	7,245	<0,01	3,157	<0,01	-0,854	<0,01
	Control obese	6,565	<0,01	0,482	0,141	0,896	<0,01
Control lean	Control obese	0,680	0,182	-2,675	<0,01	1,753	<0,01

Table 2. Pearson's correlation coefficient of BMI and serum cytokine levels in all studied subjects

		hsCRP (mg/L)	IL- 6 (pg/ml)	Adiponectin (µg/ml)
BMI	Pearson's Correlation	0,470	0,660	-0,481
	Significance (2-tailed)	<0,01	<0,01	<0,01

Conclusion

Adiponectin as anti-inflammatory adipocytokine, inhibits inflammation in allergic asthma, which can arise in pathological obesity.

Adiponectin and adipose tissue-derived cytokine IL-6, could lead to synergistic effect between obesity and progression on airway inflammation.

hsCRP can be used as a surrogate marker for evaluation of obesity and asthma while adiponectin and IL-6 could be considered surrogate markers for obesity.

References:
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