

# Determination of ADMA and Ghrelin Levels as a Marker of Endothelial Dysfunction in Asthma Patients

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# Asthma



- Asthma is a global health problem that is increasing worldwide.

## The main characteristics of asthma

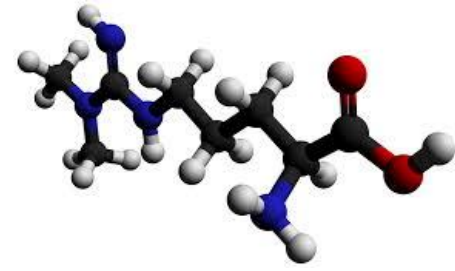
- Hyperresponsiveness of the airway to stimuli
- Reversible airflow obstruction

## Typical Symptoms of Asthma

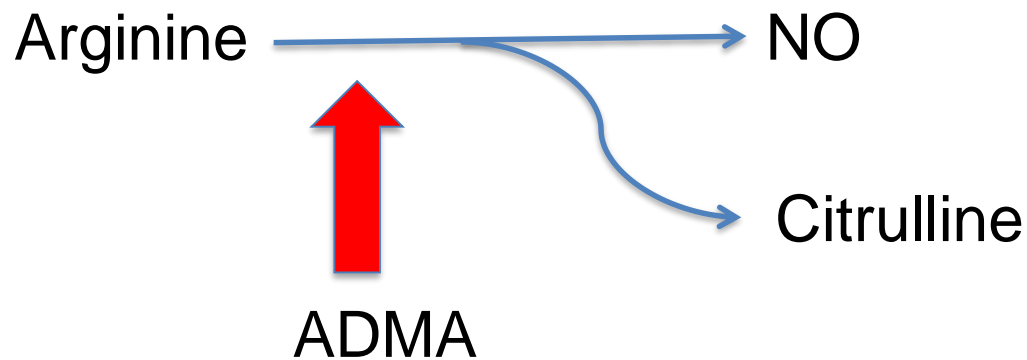
- Breathlessness
- Wheezing
- Coughing
- Chest tightness

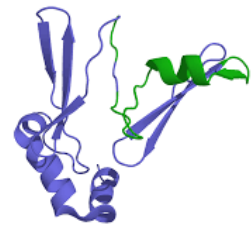
- Asthma is a chronic inflammatory disorder of the airways in which many cells and cellular elements play a role.
- It is related to other disease occurring concomitantly.
- Cardiovascular disease (CVD) is a critical comorbidity in asthmatics that are up to three times more likely to develop CVD compared to individuals without asthma.
- Endothelial function is an useful prognostic marker of cardiac incidents in CVD patients.

## Asymmetric dimethylarginine (ADMA)



- ADMA is defined as a marker of endothelial dysfunction.
- It is a competitive inhibitor of nitric oxide (NO) synthesis.
- NO plays important roles such as airway smooth muscle relaxation, airway mucus secretion, and host defense in the lung.





## Ghrelin

- Ghrelin is an appetite modulating peptide hormone in the stomach and plays a role in varied diseases associated with inflammation.
- It acts on the adaptive and innate immune systems to inhibit proinflammatory cytokines and to induce an antiinflammatory profile.
- Ghrelin may have also cardioprotective effects involving decreasing blood pressure, and preventing of atherosclerosis, as well as enhancing vascular and endothelial function.

# AIM

- We aimed to explore whether asthma has a relationship with serum levels of ADMA and ghrelin, and to evaluate these parameters in terms of risk status of coronary artery disease.

# MATERIAL AND METHODS



- Prick test and pulmonary function test (PFT) were performed in all cases.
- Thirty-eight patients diagnosed with asthma according to the GINA (Global Initiative for Asthma) guidelines.

- Individuals who applied to the emergency department due to asthma in the last month,
- who had respiratory infection in the last month,
- who had a history of hospitalization for asthma in the last three months,
- pregnant women,
- under 18 years of age,
- chronic obstructive pulmonary disease, bronchiectasis, tuberculosis, non-asthmatic lung patients with gastroesophageal reflux symptoms or disease,
- chronic disease (diabetes, congestive heart disease, chronic renal failure, irritable bowel syndrome, rheumatoid arthritis, scleroderma) were excluded from the study.
- All of the exclusion criteria defined for the patient group as well as clinical rhinitis symptoms were accepted as exclusion criteria for the control group.





ADMA levels were measured by HPLC



Ghrelin levels were analysed by using ELISA kits

# RESULTS

**Table-1.** Demographic and biochemical data of control and asthma patients (mean±SD)

	Controls (n=25)	Asthma Patients (n=38)
Age (years)	37-65	43-71
Fasting Blood Glucose (mg/dL)	99.7±8.1	101.23±5.8
Total cholesterol (mg/dL)	208.33±37.6	194.2±28.5
HDL (mg/dL)	50.2±17.5	49.8±7.3
Triglycerides (mg/dL)	115.2±58.3	119.1±66.4
Lymphocytes (mm <sup>3</sup> )	3255±1388	2462±850*
PDW(GSD)	16.2 ±1.1	17.6 ±1.6*
RDW(%)	12.9 ±2.8	14.4 ±1.2*

\* p<0.05 as compared to controls.

**Table-2.** ADMA and ghrelin levels in all groups

	Controls (n=25)	Asthma Patients (n=38)
ADMA (µmol/l)	0.47 ± 0.09	1.13 ± 0.24*
Ghrelin (pg/ml)	154.3±21.6	116.24±2.03**

\* p.0014, p<0.05 as compared to controls.

\*\* p.0039, p<0.05 as compared to controls.

# CONCLUSION

- According to our findings, asthma may increase the risk for endothelial dysfunction that leads to CVD by stimulating ADMA production.
- Ghrelin production is suppressed, and therefore, its protective functions on cardiovascular system including preventing the progression of atherosclerosis, inhibiting vascular inflammation and stimulating the formation of new vessels may be blocked in asthma.
- Our data support the idea that asthmatic patients have risk of endothelial dysfunction for cardiovascular diseases.
- There are still many uncertainties in this field, however we believe that ADMA and ghrelin levels in asthma patients may be considered to be important markers for the assessment of the risk of developing coronary artery disease.

## References

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**THANK YOU FOR YOUR ATTENTION**