**DOI:** 10.5152/TurkThoracJ.2019.147

**[Abstract:0880] MS-212 [Accepted: Oral Presentation] [Asthma Allergy]**

# Evaluation of Asthma and Air Pollution in Kırıkkale Province

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**Objectives:** Exposure to air pollutants has been correlated with an increase in the airway symptoms. However, whether or not air quality can affect asthma control in adults in relation with thiol/disulfide hemostasis remains unkown. The aim of this study was to search the effects of air quality on asthma control and oxidant-antioxidant pathways.

**Methods:** Visits were schedeled as V1 on December and January when the air quality most polluted in the previous year of Kirikkale and as V2 on May and June with the most clean air. Adult subjects with asthmaand healthy volunteers were scanned retrospectively for health data, and prospectively for symptoms, physical examination, air quality survey, and blood samples in two visits. TAS and TOS, total thiol and native thiol levels in serum of each participant were measured by a novel automated spectrophotometric method.

**Results:** The majority of the asthmatic patients (n:57) and the control group (n:51) dyspnea was the most common symptom in asthmatics due to air pollution, despondency developed in healthy individuals, and both groups complained about dryness of skin, throat, and eyes. The number of asthmatic patients presenting to the hospital per year was negligible with PM10, but significantly correlated with $SO_2$, humidity and temperature of the outdoor air. In V1 and V2, the rates of admission to outpatient clinic and hospitalization of the last month were significantly higher in the asthmatics than the control group. Hospitalization and emergency visit in asthmatics was more frequent in V1 than in V2 (p=0.01,p=0.03). Asthma control test (ACT) scores were significantly lower in V1 than in V2.ACT uncontrolled rate and OCS use were more frequent in V1. Serum TAS and TOS values of asthmatics were higher in V1 and V2 than in healthy subjects. Only, TOS values of asthmatics were higher in V1 than V2,whereas TOS was higher in V1 than V2 in healthy subjects. Thiol/disulfide hemostasis rates were similar in asthmatic and healthy subjects at every 2 visit, and V1>V2 in asthmatic and healthy subjects. Serum crp, total IgE, blood eosinophils V1 and V2 were higher in asthmatics, whereas in group comparisons only crp V1>V2. Allergic asthmatics were found to be higher in V2 than in non-allergic subjects (p=0.04). Early-onset asthma was significantly higher in patients with late-onset asthma than in patients with late-onset asthma (p=0.02).

**Conclusion:** This study showed that air pollution was associated with increased respiratory complaints, hospital admissions, antibiotic-oral steroid use, and serum crp levels, and impaired respiratory test values, asthma control and oxidant-antioxidant and thiol/disulfide hemostasis in mainly asthmatics, and some in healthies. Low level of awareness about air pollution in both asthma and healthy subjects is a condition that needs to be assessed. Air pollution did not have a different effect on asthma phenotypes.

**Keywords:** Antioxidant, asthma, air pollution, particulate matter, oxidant, thiol/disulfide