

VOLUME 3, NUMBER 1, 2010

**J** *OURNAL OF*  
**Biomedical &  
Clinical  
Research**

Also available on [jbcr.mu-pleven.bg](http://jbcr.mu-pleven.bg)

**JBCR**

MEDICAL UNIVERSITY - PLEVEN 



Original Article

## EFFECT OF L-2-OXOTHIAZOLIDINE -4-CARBOXYLIC ACID ON MARKERS OF INFLAMMATION AND LIPID PEROXIDATION IN BRONCHOALVEOLAR LAVAGE FLUID IN MICE MODEL OF ASTHMA

Ljudmil G. Terziev,  
Vanya Tsetkova,  
Veneta L. Shopova<sup>1</sup>,  
Violeta Y. Dancheva<sup>1</sup>,  
Galya T. Stavreva<sup>2</sup>,  
Milena A. Atanasova<sup>3</sup>,  
Tzvetan H. Lukanov,  
Angelina M. Stoyanova<sup>4</sup>

*Sector of Clinical Immunology and Allergology*

<sup>1</sup>*Sector of Disaster Medicine*

<sup>2</sup>*Sector of Experimental and Clinical Pharmacology*

<sup>3</sup>*Sector of Biology*

<sup>4</sup>*Sector of Chemistry*  
*Medical University*  
*Pleven, Bulgaria*

**Corresponding Author:**

Ljudmil G. Terziev  
Clinic of Clinical Immunology and Allergology,  
University Hospital –Pleven  
81 Vladimir Vazov str.  
Pleven, 5800  
e-mail: [luterzi@mail.bg](mailto:luterzi@mail.bg)

**Received:** June 25, 2010

**Revision received:** July 15, 2010

**Accepted:** July 29, 2010

### Summary

Asthma is a serious medical and social problem, characterized by an inflammatory response and production of a large amount of reactive oxygen species. Our goal was to study the effect of a glutathione precursor on some markers of inflammation and lipid peroxidation in an animal model of asthma. The study was carried out on 28 C<sub>57</sub>B1 mice, divided into four groups: group 1 - controls; group 2 - injected and inhaled with ovalbumin (OVA); group 3 - treated with L-2-oxothiazolidine-4-carboxylic acid (OTCA) and inhaled with phosphate buffered saline; group 4 - injected with ovalbumin and OTCA, as well as inhaled with OVA. Under sodium pentobarbital anaesthesia the animals were sacrificed on hour 48 after the last inhalation to obtain bronchoalveolar lavage fluid (BALF). The total cell number and cell counting, total protein content, the levels of Il-4, Il-5 and 8-isoprostane were investigated in BALF. OVA increased the total cell number and the levels of Il-4, Il-5 and 8-isoprostane. OTCA significantly decreased the total cell number, the total protein content, as well as the levels of Il-4, Il-5 and 8-isoprostane in comparison with ovalbumine. OTCA attenuates inflammation and lipid peroxidation in asthma provoked by ovalbumin in a mouse model.

**Key words:** asthma, bronchoalveolar lavage fluid, inflammation, lipid peroxidation, L-2-oxo thiazolidine-4-carboxylic acid

### Introduction

Over the last 10 years the incidence of bronchial asthma has increased by more than 29% in West European countries [1], and has been accompanied by increase in associated mortality rate [2]. Asthma is a chronic inflammatory disease characterized by Th<sub>2</sub> cytokines with a specific profile of released cytokines [3]. The upper airways are mostly affected, which leads to an interaction between the cells and mediators. This results in increased production and release of reactive oxygen species (ROS) in the airways [4]. There is a consensus about the relation between oxidants and their effects on different pulmonary diseases, including asthma [5, 6]. Bronchial inflammation plays a leading role in the clinical manifestation and pathogenesis of the disease. Impaired antioxidant capacity in asthma