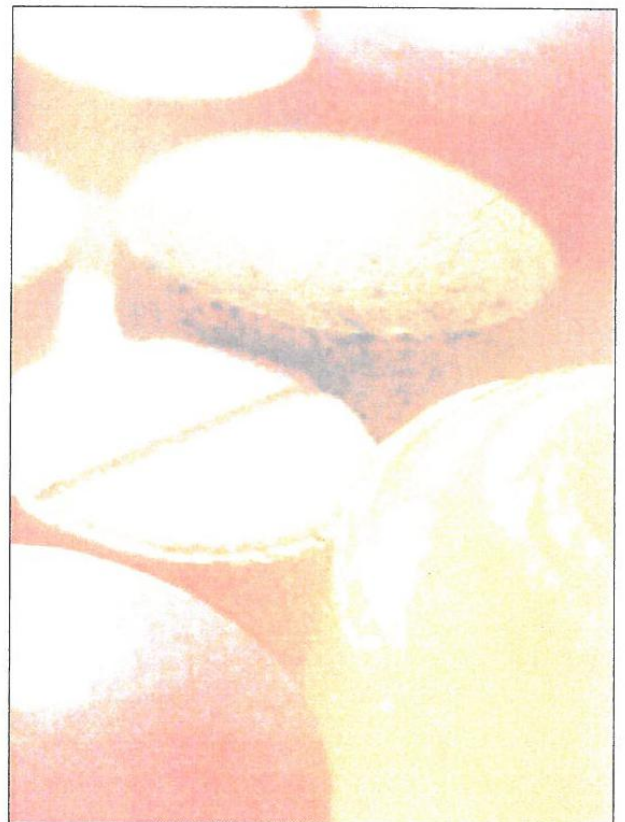




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# EFFECTS OF MnTnHex-2-PyP ON MARKERS OF INFLAMMATION AND LIPID PEROXIDATION IN ASTHMA MICE MODEL

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## ABSTRACT

**Background and objective:** Investigation of the effects of MnTnHex-2-PyP on some markers of inflammation and lipid peroxidation in an asthma mice model.

**Methods:** The experiment was carried out on 24 female mice C57Bl/6, divided into four groups: group 1, controls; group 2, injected with ovalbumin (OVA); group 3, treated with MnTnHex-2-PyP and group 4, treated with OVA and MnTnHex-2-PyP. The animals from groups 1 and 3 were injected *i.p.* on days 0 and 14 with a 100  $\mu$ l phosphate-buffered saline (PBS), and those from groups 2 and 4 were injected with a 100  $\mu$ l ovalbumin solution, containing 20  $\mu$ g OVA. On days 24, 25 and 26 the mice from groups 1 and 2 were inhaled with PBS for 30 min, and those from groups 2 and 4 were given a 1% ovalbumin solution. One hour before inhalation, and 12 hours later the animals from groups 1 and 2 were injected *i.p.* with 100  $\mu$ l PBS, and those from groups 3 and 4 received a 100  $\mu$ l MnTnHex-2-PyP solution in PBS containing 0.05mg/kg.

**Results:** Ovalbumin alone (group 2) increased the total cell number, total protein content, the levels of IL-4, IL-5 and 8-isoprostane in bronchoalveolar lavage. Elevations were observed in IgE level in serum, and the malone dialdehyde (MDA) content in the lung homogenate. These markers were decreased significantly in group 4 as compared to the OVA group.

**Conclusions:** MnTnHex-2-PyP reduces the inflammation and lipid peroxidation in Ovalbumin-induced mice asthma model.

## JEL CLASSIFICATION & KEYWORDS

■ I19 ■ Asthma ■ BALF ■ Inflammation ■ Lipid Peroxidation ■ Lung Homogenate ■ MnTnHex-2-PyP.

## INTRODUCTION

The large surface area, blood supply and high oxygen environment predispose the lungs to cellular injury induced by oxidative stress (1). It is widely agreed that a link exists between oxidants and their effect on a number of pulmonary diseases, particularly asthma pathogenesis (2-5). The incidence of bronchial asthma, a chronic inflammatory disease, has reached more than 29% in recent years in the West European countries (6). It is assumed that the pathogenesis of asthma is associated with chronic airway inflammation and increased oxidative stress (7,8). Inflammatory cells such as activated eosinophils, neutrophils, monocytes and macrophages, by way of infiltrating the airways in asthmatics, have the exceptional capacity to generate reactive oxygen species (ROS) and lipid peroxidation products under the influence of various stimuli (9,10). The body has a powerful antioxidant system, which may delay or prevent oxidation, but also eliminate reactive oxygen species. At high levels of oxidative stress, however, antioxidants become depleted, and an imbalance between oxidants and antioxidants occurs, which causes pathological damage (11). In recent years new different classes of antioxidants have been introduced as a method for treatment of pulmonary diseases associated with oxidative stress. Catalytic manganese metalloporphyrins belong to a novel and potent class of lipid peroxidation inhibitors. We aimed to study the effect of MnTnHex-2-PyP (Manganese (III) 5,10,15,20-tetrakis(N-hexylpyridinium-2-yl) porphyrin) on some markers of inflammation and lipid peroxidation in asthma mice model.

## Materials and methods

### • Chemicals

Ovalbumin, grade V and phosphate buffered saline (PBS), were purchased from the Sigma-Aldrich Company. Nitrocellulose filters with 5 $\mu$ m pores were received from Millipore Corp, IL-4 and IL-5 ELISA Kits were purchased from R&D Systems, 8-Isoprostane EIA Kit received from Cayman chemicals, Mouse IgE ELISA Set was purchased from BD Biosciences, and Imject Alum® was obtained from Pierce Chemical Company (USA).

MnTnHex-2-PyP was kindly provided by Ines Batinić-Haberle from the Department of Radiation Oncology, Duke University Medical Center, Durham, North Carolina, USA.

### • Animals and experimental protocol

The experiment was performed in accordance with the regulations for animal welfare and was approved by the University Ethics Committee.

The study was carried out on 24 female mice C57Bl/6 (weight 20±2g, 8-10 weeks old). The animals were raised at the University animal vivarium at a temperature of 22±2°C and humidity of 50±10%, given normal pelleted diet and water ad