Effect of 2Gly.ZnCl₂.2H₂O on antioxidant status in rats under fasciolosis

M. Gabrashanska¹, M.Y. Manga-Gonzalez², S. Ermidou-Pollet³, M. Anisimova¹
and S. Tepavitcharova⁴

¹Institute of Experimental Pathology and Parasitology, Bulgarian Academy of Sciences, Sofia, Bulgaria, ²Estacion Agricola Experimental, Consejo Superior de Investigaciones Cientificas, Leon, Spain, ³Medical School, University of Athens, Greece, ⁴Institute of General and Inorganic Chemistry, Bulgarian Academy of Sciences, Sofia, Bulgaria

Key words

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Abstract. The aim of our study was to assess the liver antioxidant status (SOD, GPx, vitamins A, C and E, Se, Zn, MDA), body weights and parasite burden in male Wistar rats experimentally infected per os with *Fasciola hepatica* (25 metacercariae) and treated with a daily dose of 6 mg 2Gly.ZnCl₂.2H₂O. During the acute (4 weeks) and chronic stage (6–10 weeks) of fasciolosis, antioxidant/oxidant imbalance occurred. SOD activity, levels of vitamins A, C, E, Zn and Se were reduced whereas the amount of MDA was increased. Body weights were lower in the infected rats during the acute and chronic stages. Application of 2Gly.ZnCl₂.2H₂O increased the enzyme activities, the levels of vitamin E and A, Zn and Se, and reduced MDA concentration. Body weights increased but the parasite burden was not changed after treatment. The compound did not show antiparasitic action.

Introduction

The fluke *Fasciola hepatica* is distributed worldwide and is responsible for the major liver parasitic infections in humans and domestic ruminants. Recent studies indicated that fasciolosis led to oxidative stress which is the causative agent for the initiation and progress of lipid peroxidation in the host [Gabrashanska et al. 2007, Kolodziejczyk et al. 2005].

Many antioxidant defenses depend on micronutrients (Zn, Cu, Se, Mn) or are micronutrients themselves [Halliwell and Chirico 1993]. Among them, zinc has received increasing attention because of the recently

available evidence that its deficiency may have serious consequences in humans and animals [Alaf et al. 2002]. It is an essential constituent of various enzyme molecules, proteins and biomembranes. This element plays a fundamental role in the immune system, as well as in the cellular metabolism, rapidly increasing the cell turnover [Fraker 2000]. It can modulate host resistance to various infections [Powell 2000]. Zn has been shown to play an antioxidant role in defined chemical systems. Administration of pharmacological doses of Zn in vivo has a protective effect against prooxidants in general but also against those that are liver-specific [Sidhu et al. 2005].

The present study is aimed at determining the effect of 2Gly.ZnCl₂.2H₂O on oxidative and antioxidant systems in rats infected with *Fasciola hepatica* in an acute (4 wpi) and chronic stage (6–10 wpi). Vitamins A, C, E, Zn, Se and malondialdehyde (MDA) levels, as well as glutathione peroxidase (GPx) and CuZn superoxide dismutase (Cu,Zn-SOD) activities were the parameters of oxidative/antioxidant status that have been investigated in animals.

Material and methods

80 4-week-old male Wistar rats were divided into 4 groups (20 rats each group): Group 1: control, Group 2: control and treated with 2 Gly.ZnCl₂.2H₂O, Group 3: infected experimentally with *F. hepatica*, Group 4: in-

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Correspondence to
Prof. M. Gabrashanska
Institute of Experimental
Pathology and Parasitol-
ogy, Bulgarian Academy
of Sciences
Acad. G. Bonchev Str.
Bl. 25, 1113 Sofia,
Bulgaria
m_gabrashanska@
abv.bg