Serum malondialdehyde level and activity of total antioxidant status of dogs with age-related cataract

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Abstract

Study objective: determination of malondialdehyde (MDA) level and total antioxidant status (TAS) in the serum of dogs with age-related cataract.

Material and methods: Forty dogs, 10-16 years of age, which were diagnosed with age-related cataract were examined. The control group consisted of 12 dogs, 8-13 years of age, without cataract. MDA was determined using a Perkin-Elmer LS 30 luminescence spectrometer using the method with thiobarbituric acid (TBA). TAS was determined using the colorimetric method with a set of Randox Total Antioxidant Status reagents.

Results: The results show a higher level of MDA with statistically significant difference and lower activity of TAS in the serum of dogs with age-related cataract.

Conclusions: The results obtained indicate higher systemic lipid peroxidation and weakening of the general defense system in dogs with age-related cataract. These results suggest that such conditions may have an effect on the development of age-related cataract and are consistent with the theory of free radical age-related cataract development.

Key words: dogs, age-related cataract, serum malondialdehyde, total antioxidant status

Introduction

Cataract is a change in the structure, biochemical processes and method of light ray transfer through the lens of the eye. Age-related cataract (ARC) is the main cause of decrease in visual acuity and blindness in people. In dogs a similar situation is observed and therefore a study was performed to demonstrate that cataract of different degrees occurs in all dogs over 13.5 years of age and its prevalence has increased in the last 40 years by 255% (Gelatt 2005). Currently, a hypothesis of multifactorial pathogenesis of age-related cataract is proposed and oxidative stress seems to be the most probable factor of biochemical mechanisms which initiate the formation of opacities in lenses (Gelatt 2005, Kalużyń 2007).

This study determines MDA level and TAS in the serum of dogs with diagnosed age-related cataract at different stages and without general diseases.