

Summary

Cadmium is a highly toxic heavy metal with pro-oxidative properties, and the available literature data indicate that even low exposure to this metal poses a risk to the health of the general population and leads to damage to many tissues and organs, including bones, kidneys, liver and the masticatory system, including the salivary glands. Due to the fact that the exposure of the general population to this metal will increase, effective ways of preventing the negative effects of its impact are being sought. One of them may be the use of the antioxidant potential of polyphenolic compounds that are a component of the black chokeberry extract and the ability of these compounds to complex Cd^{2+} ions.

The aim of the study was to investigate whether the administration of *A. melanocarpa* fruit extract rich in polyphenols in conditions of low and moderate exposure to cadmium could protect the parotid gland against oxidative damage caused by this metal.

The study was conducted on 96 young (3-4 weeks) female Wistar rats in a model reflecting low (1 mg Cd / kg feed) and moderate (5 mg Cd / kg feed) human exposure to cadmium. Parotid gland was obtained from animals treated for 3 and 10 months with 0.1% aqueous extract of black chokeberry fruit (Adamed company, containing 65.74% polyphenolic compounds) as the only drinking liquid and / or feed containing 1 or 5 mg Cd / kg (Animal feed factory "Morwaski", Kcynia) and control animals.

The antioxidant status (superoxide dismutase, catalase, glutathione peroxidase, reduced glutathione, total antioxidant status), the oxidative status (myeloperoxidase, hydrogen peroxide) and the degree of stress intensity (oxidative stress index) in the parotid gland were assessed, as well as protein biomarkers (oxidative damage biomarkers (protein carbonyl groups) and lipids (lipid peroxides).

The authors' own research showed that both moderate and low exposure to cadmium weakened the enzymatic antioxidant barrier, increased the concentration of hydrogen peroxide, and, as a result, the development of oxidative stress and oxidative damage to proteins and lipids in the parotid gland. The most important achievement of the conducted research is the demonstration, for the first time, that the administration of 0.1% fruit extract at both levels of exposure to Cd prevents the development of oxidative stress and protects against oxidative damage to proteins and lipids in the studied gland. The protective effect of chokeberry fruit extract during cadmium exposure can be explained by the independent influence of the extract resulting from its high antioxidant potential and the interaction of its components with this element, which in turn is related to the ability of the extract's components to complex Cd^{2+} ions and reduce the accumulation of this metal in the parotid gland.

Summing up, it should be stated that the results of own research bring new data on the protective role of *Aronia melanocarpa* fruit extract in relation to the parotid gland during cadmium exposure and confirm the possibility of using chokeberry fruit preparations in preventing the toxic effect of this metal on oral health.