

Zofia Dąbrowska, Adam Dąbrowski, Paweł Onopiuk, Barbara Onopiuk
**ASSESSMENT OF THE IMPACT OF POLYPHENOLS ON THE OXIDATION –
REDUCTION SYSTEM OF SUBMANDIBULAR GLAND OF RAT EXPOSED TO
CADMIUM**

Tutor Assoc. Prof. Małgorzata Pietruska, Ph.D.

Department of Periodontology, Medical University of Białystok, Białystok, Poland

Rationale. Cadmium is absorbed by living organisms from a variety of sources, both natural and industrial. For the general population, the main source of cadmium exposure is food, drinking water and tobacco. Tobacco is characterized by high cadmium accumulation potential. The studies on the general population indicate that smoking significantly increases the cadmium levels in blood and urine. The health consequences of prolonged exposure to cadmium can be found both in hard and in soft tissue, including in the oral cavity. Chronic exposure to cadmium increases its concentration level in teeth, as well as in the salivary glands and saliva. Black chokeberry (*Aronia melanocarpa*), is one of the richest sources of polyphenols (Table 1) and has very strong antioxidant potential due to its components such as anthocyanins, flavonols, phenolic acids and tannins, as well as vitamins and minerals.

Objective: The concentration levels of enzymatic and non-enzymatic oxidative stress markers were assayed in the submandibular gland of control group animals and in the groups receiving *Aronia melanocarpa* extract and/or cadmium.

Material and methods. The concentration of hydrogen peroxide in the submandibular gland homogenates of Wistar rats treated for 3 and 10 months with 0,1 % *Aronia melanocarpa* berries extract and/or cadmium (1 or 5 mg Cd/kg diet), as well as control animals, was measured. Parameters as lipid peroxidation (LPO), total oxidant status (TOS) were tested. The obtained results were analyzed statistically using Statistica 10 software (StatSoft; Tulsa, USA).

Results and discussion. At a higher level of cadmium exposure, the oxidative stress index (TOS) value was higher than in rats which received cadmium at lower levels. At higher cadmium exposure levels, the LPO level was higher than in the rats which received cadmium at lower concentration levels - 43% higher after 3 months and 92% higher after 10 months.

Conclusions. Administering the extract of polyphenols from black chokeberry fruit during cadmium exposure completely prevents the LPO (3 and 10 months) and TOS (3 and 10 months) cadmium-induced accumulation in the submandibular gland. Administering the extract of polyphenols from black chokeberry fruit during cadmium exposure may inhibit the oxidative stress in the submandibular gland.