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ASSESSMENT OF AMANTADINE'S ANTIOXIDANT AND ANTIGLYCATING ACTIVITY

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Relevance. Amantadine is used as an antidyskinetic drug in Parkinson's disease and parkinsonian syndromes as well as for the prevention and treatment of influenza A. Despite its multidirectional action, including exerting anti-inflammatory properties on brain neural tissue, the exact mechanism of action of this drug is still not precisely known.

Target. Evaluating the antioxidant and antiglycating abilities of amantadine in an *in vitro* model.

Materials and methods. In our study, bovine serum albumin (BSA) was used as *in vitro* model of protein oxidation/glycation. The study was conducted in three series, every time in duplicate. We evaluated the scavenging of reactive oxygen species by amantadine (hydroxyl radical scavenging and hydrogen peroxide scavenging), the antioxidant properties of albumin (2,2-diphenyl-1-picrylhydrazyl radical scavenging capacity, total antioxidant capacity, and total oxidant status), the content of protein oxidation products (protein carbonyls groups and advanced oxidation protein products), as well as the intensity of protein glycation (Amadori products and β -amyloid). We compared the effectiveness of amantadine protective properties with recognized protein glycation (aminoguanidine) and oxidation (N-acetylcysteine (NAC)) inhibitors.

Results and their discussion. Amantadine, in contrast to control agents (aminoguanidine and NAC), did not show antioxidant and antiglycating properties. Furthermore, the studied drug in some cases had a prooxidant and proglycating impact. Molecular docking did not reveal strong binding sites of the amantadine molecule on bovine serum albumin. This is the probable reason for the lack of a proven protective effect against protein oxidation/glycation. However, further thorough studies should be conducted to search for its hitherto unrecognized mechanisms of drug action.

Findings. In conclusion, our results indicated that amantadine does not exhibit antioxidant and antiglycation properties. However, further thorough studies should be conducted to search for its hitherto unrecognized mechanisms of drug action.