EFFECT OF THE COLONIC METABOLITE UROLITHIN-A ON ANTIOXIDANTE DEFENSES IN GLIAL CELLS

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RESUMO

Introduction: Ellagic acid (EA) is a phenolic compound present in a variety of nuts, seeds, and fruits. EA have been widely investigated for their health benefits in humans, including their antioxidant properties. During the process of gastrointestinal digestion, EA is metabolized by the gut microbiota and one of the generated products is called urolithin-A (URO-A), a type of metabolite that exhibit higher bioavailability compared to EA. Furthermore, URO-A can cross blood-brain barrier and appears to be responsible for the beneficial effects associated with the consumption of EA. **Objective:** The aim of this study is to evaluate the effect of URO-A on antioxidant defenses in glial cells. **Methodology**: Glia C6 cells were treated with URO-A (0, 3, 30, 60 and 100 µM) during 24h. Afterwards, cells were washed in order to remove the treatments and used for analyses. Antioxidant enzyme catalase (CAT) activity and total thiol (SH) groups were evaluated by spectrophotometric methods, as markers of cellular antioxidant defenses. **Results and discussion:** No significant differences were observed in the content of total SH groups between control cells and those treated with concentrations of URO-A ranging from 3 to 100 µM ($p>0.05$). However, the treatment of cells with URO-A at 60 and 100 µM induced CAT inhibition ($p>0.05$), suggesting that URO-A, at higher concentrations, can exert a pro-oxidant effect. Thus, we can not rule out that the reducing power of URO-A against Cu^{3+} generates Cu^{2+}, which can induce free radicals generation by Fenton-like reaction and CAT inhibition. Glial cells are non-neuronal cells essential for maintaining central nervous system homeostasis and the integrity of the blood–brain barrier, providing support and protection to neurons. As far as we know, this is the first study showing pro-oxidant effects of URO-A in nervous system cells. This may be of extreme importance in neurodegenerative diseases, as neural cells are recognized for their elevated vulnerability to oxidative damage. **Conclusion:** our study reports, for the first time, a negative effect of high concentrations of URO-A on cells from central nervous system. Moreover, lower concentrations of URO-A (3 to 100 µM) seems to be more suitable for future studies.

PALAVRAS-CHAVE: C6 cells, phenolic compounds, elagic acid, bioavailability, oxidative stress

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