

Protective effect of some natural antioxidants on Olfactory Ensheathing Cells exposed to amyloid- β toxicity: A potential therapeutic role in preserving neurodegenerative diseases

R.M. Pellitteri¹, M.A. Chiacchio², M. Spatuzza¹, G. Raciti², A. Campisi²

¹National Research Council, Institute for Biomedical Research and Innovation, Catania, Italy, ²University of Catania, Department of Drug Sciences and Health, Catania, Italy

Topic & Theme selection

Main Topic: G.2.a: APP and Abeta

Title

Abstract Body

Abstract body: In recent years, attention has grown on neuro-nutraceuticals and their effect on the health of the nervous system, since many compounds are characterized by antioxidant and anti-inflammatory activities. In the present study the effect of natural compounds (NCs), such as astaxanthin, curcumin and berberine was immunocytochemically assessed on expression of some cytoskeletal proteins, such as vimentin, Glial Fibrillary Acid Protein (GFAP) and nestin (a marker of precursor neural stem cells) in Olfactory Ensheathing Cells (OECs) exposed to amyloid- β (A β). In addition, we investigated on tissue transglutaminase (TG2) expression, an ubiquitarily calcium-dependent protein, involved in protein aggregation in Alzheimer Disease (AD), characterized by accumulation of neurotoxic A β . OECs show stem cell properties, expressing Nestin, and used since an early sign of neurodegeneration is related with functionally reduced olfactory performance. The percentage of cell viability by MTT test and the apoptotic pathway activation were also evaluated. Our findings highlighted that A β exposure on OECs induced an increase in vimentin, GFAP and TG2 expression and decreased nestin expression. NCs pre-treatment in cells was able to decrease GFAP, Vimentin and TG2 expression, inhibiting glial reactivity. In addition, these compounds inhibited apoptotic pathway activation caused by A β and induced an increase in the Nestin expression. These results highlight that NCs in OECs exert a protective effect against A β toxicity, and they might represent a promising tool for neural regeneration and for potential therapy to slow or prevent the progression of neurodegenerative diseases.

Keywords

Keywords: Yes

Keyword 1: neuro-nutraceuticals

Keyword 2: Olfactory Ensheathing Cell

Keyword 3: neurodegenerative diseases

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