Cerebral Endothelial Cell Culture Medium Leads to Resistance of Astrocytes to Catechol-Induced Damage

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INTRODUCTION. Endothelial cells and astrocytes have important functions in the Blood-Brain barrier and cerebral homeostasis. Recent studies show that isolated cultures of these cells respond differently than mixed cultures to challenges. **OBJECTIVE:** To evaluate the resistance of endothelial cells and astrocytes to catechol-induced cytotoxicity. **MATERIAL AND METHODS:** Glial cells were obtained from newborn W*istar* rats. Cells were cultured in supplemented DMEM F12 in 75 cm^2 flasks, incubated at 37 ºC, 5% CO_2, until they reach confluence. Cerebral endothelial cells (CEC) of W*istar* rats were cultured in EGM2/DMEM F12 in plates coated with collagen. Astrocytes were treated with 10 - 2000 µM cathecol in the absence or in the presence of 50% (v/v) or 100% CEC conditioned culture medium for 72 h. CEC were exposed to 30 - 6000 µM catechol in the absence or the presence of 50 % (v/v) or 100% astrocytes conditioned medium. The cytotoxicity was evaluated by the MTT assay. EC_{50} were represented by median, 25^{th} and 75^{th} percentiles (n = 9). **RESULTS AND DISCUSSION:** CEC showed resistance to damages induced by catechol but it induced cytotoxicity to astrocytes: EC_{50} 38 µM (25^{th} and 75^{th} percentiles). However, the presence of 50% or 100% CEC conditioned medium increased the resistance of astrocytes to catechol: EC_{50} 247 µM (25^{th} and 75^{th} percentiles) and 158 µM (25^{th} and 75^{th} percentiles), respectively. Morphological analyses showed reactive astrocytes after treatment with 100 and 300 µM catechol. Damages were associated with quinones generation. The protection did not depend on cellular interaction. A protectant agent is probably secreted by CEC exerting a paracrine action. **CONCLUSION**: CEC are more resistant to damages induced by catechol than astrocytes. CEC conditioned medium protects astrocytes against catechol-induced cytotoxicity. However, the identification of protectant molecules secreted by CEC remains to be established.

KEYWORDS: blood-brain barrier; cerebral endothelial cells, astrocytes; endothelial cells/astrocytes interactions

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