

عنوان مقاله:

Evaluation of the Protective Effect of Organophosphorus Hydrolase on SH-SY5Y Human Neuroblastoma Cells Treated with Parathion

محل انتشار:

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خلاصه مقاله:

Introduction: Organophosphorus (OPs) compounds are chemical compounds used in pesticides that contain synthetic esters, amides, and thiol derivatives of phosphoric, and phosphonic acids. The OPs are harmful to humans and animals because of compounds such as parathion. By acting on nerve cells, parathion creates very dangerous cellular oxidative stresses, which in turn activate programmed cell death. **Materials and Methods:** In this study, the enzyme Organophosphorus Hydrolase (OPH) having esterase activity was selected with the aim of influencing its reaction product with parathion on the viability of human nerve cells. The neuroblastoma SH-SY5Y cell line was exposed to parathion ($700 \mu\text{g/ml}$) ($\approx 40\%$ reduced cell viability) and the product of OPH esterase reaction ($1 \mu\text{g/ml}$) with the same parathion concentration for two hours to determine their cytotoxicity ($\approx 25\%$ reduced cell viability) by MTT, real-time PCR and flow cytometry techniques. **Results:** The results revealed that parathion ($100 \mu\text{g/ml}$) inhibited acetylcholinesterase activity by $\approx 65\%$ while OPH-related product reduced acetylcholinesterase activity by $\approx 26\%$. **Conclusions:** Considering the widespread use of OPs in modern agriculture, the OPH can be used to reduce the OPs' destructive effects and the current study could provide new insight into healthy modern agriculture.

کلمات کلیدی:

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