



Primary hippocampal neuronal cell death induction after acute and repeated paraquat exposures mediated by AChE variants alteration and cholinergic disruption.

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## INTRODUCTION

Paraquat (PQ) is a widely used non-selective contact herbicide shown to produce memory and learning deficits after acute and repeated exposure similar to those induced in Alzheimer's disease (AD). However, the complete mechanisms through which it induces these effects are unknown. On the other hand, cholinergic system, mainly in the hippocampus, are involved on learning, memory and cell viability regulation. An alteration of hippocampal cholinergic transmission or neuronal cell loss may induce these effects. In this regard, it has been suggested that PQ may induce cell death and affect cholinergic transmission, which alteration could produce neuronal loss. According to these data, we hypothesized that PQ could induce hippocampal neuronal loss through cholinergic transmission alteration.

## METHODS

We evaluated in hippocampal primary cell culture, PQ toxic effects after 24 h and 14 consecutive days exposure on neuronal viability and the cholinergic mechanism related to it.

## RESULTS

PQ impaired cholinergic transmission through AChE and CHT alteration only after 14 days exposure, PQ induced, after 24 h and 14 days exposure, cell death on hippocampal neurons that was partially mediated by AChE variants alteration and cholinergic transmission disruption.

## CONCLUSIONS

Our present results provide new view of the mechanisms contributing to PQ neurotoxicity and may explain cognitive dysfunctions observed after PQ exposure.

