Selenium reduces bradykinesia and DNA damage in a rat model of Parkinson's disease.

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OBJECTIVE: The aim of this study was to explore the effects of selenium (Se) on locomotor activity and DNA damage in a rat model of Parkinson's disease (PD) induced by paraquat (PQ).

METHODS: Forty-eight male Wistar rats were divided into four groups: control group (n = 12), Se group (n = 12), PQ group (n = 12), and Se + PQ group (n = 12). PQ was administered intraperitoneally (10 mg/kg). Se was offered in the drinking water at a concentration of 11.18 μg/L. Locomotor activity was evaluated weekly using the narrow beam test. The comet assay was performed to assess the level of DNA damage in leukocytes and in brain cells.

RESULTS: As expected, increased DNA damage was found in the PQ group compared with the control and Se groups (P < 0.001). Interestingly, coadministration of Se and PQ effectively prevented the harmful effects of the toxin in locomotor activity and at the molecular level, reducing bradykinesia (P < 0.01) and DNA damage in leukocytes compared with the PQ-only group (P < 0.001), whereas the levels of DNA damage were comparable to those found in the control and Se groups (P > 0.05). Using the comet assay to analyze brain cells, no differences were found between the groups with regard to damage index (P = 0.774), damage frequency (P = 0.817), or non-detectable cell nuclei (P = 0.481).

CONCLUSION: In this experimental model of PQ-induced PD, the use of Se could contribute to the maintenance of locomotor activity and the integrity of leukocytes DNA. No changes in the levels of DNA damage in brain cells were observed between the experimental groups.

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