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MEETING ABSTRACT

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N-Acetylcysteine reverses the anxiogenic effects of cisplatin in rats

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Background: Since the numerous side effects of cisplatin treatment seem to be accompanied with increased oxidative stress, the aim of this study was to estimate the possible beneficial effects of *N*-acetylcysteine (NAC) supplementation along with cisplatin administration in order to prevent the behavioral adverse effects of cisplatin.

Methods: Thirty-two male Wistar albino rats (250–300 g, 3 months old) were randomly divided in four equal groups: control, cisplatin (treated with single intraperitoneal injection of cisplatin, 5 mg/kg), NAC (single intraperitoneal injection of *N*-acetylcysteine, 500 mg/kg) and cisplatin plus NAC (simultaneous administration of cisplatin and NAC, 5 and 500 mg/kg, respectively) group. The behavioral testing was performed 5 days following the treatment by means of open field (OF) and elevated plus maze (EPM) tests.

Results: The anxiogenic effect of cisplatin was manifested through decrease in the cumulative duration and frequency to center zone in OF (60%, $p < 0.01$), as well as by reduction of cumulative duration and frequency to open arms in EPM test (70% and 65%, respectively; $p < 0.01$). Cisplatin administration also reduced the locomotor activity in both tests, expressed as total distance moved (45%; $p < 0.01$). The diminished exploratory activity following cisplatin treatment was manifested by means of decline in the number of rearings (65%; $p < 0.01$) in the OF test and the total exploratory activity episodes in the EPM test (60%; $p < 0.01$). Although the administration of NAC alone did not affect estimated behavioral parameters, simultaneous administration of NAC with cisplatin resulted in the attenuation of cisplatin-induced anxiety patterns. NAC increased the cumulative duration and frequency to center zone in OF (80% and 120%, respectively; $p < 0.01$), as well as the cumulative duration and frequency to open arms in the EPM test (200% and 135%, respectively; $p < 0.01$) compared to the cisplatin group. Also, administration of NAC along with cisplatin reversed the cisplatin-induced decrease in exploratory and locomotor activity to the control values.

Discussion: The results obtained in this study strongly suggest anxiogenic effects of cisplatin administration. However, the anxiogenic effect of cisplatin treatment was significantly attenuated by simultaneous application of NAC.

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