

Neurotransmitter Levels on Rat Brain Regions after Subchronic Administration of Ofloxacin with and without Stress

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INTRODUCTION

Ofloxacin (OFLO) a Fluoroquinolone is involved in various CNS adverse effects as dizziness, restlessness, delirium, hallucinations and seizures. These effects are attributed to an inhibitory action of newer quinolones on GABA_A receptors. The aim of the present study was to investigate the influence of subchronic ofloxacin administration with and without stress on DA, 5-HT and metabolites DOPAC, HVA, and 5-HIAA levels in the prefrontal cortex (PC) and striatum (Sr) of rats.

MATERIALS AND METHODS

Forty male rats in four groups were treated as follows.

Group I received sc 25 mg/Kg/24 hours OFLO for 9 consecutive days.

Group II received the same volume of vehicle for also 9 days.

Group III was treated as the I plus foot shock stress on the 7th, 8th and 9th day of the experiment. OFLO was given 25 min before stress submission.

Group IV was treated as the II one plus stress.

RESULTS

OFLO increases DA turnover rate (DOPAC/DA) in Sr. Stress decreases DA turnover rate while increases 5-HT turnover rate (5HIAA/5-HT) in PC. OFLO plus stress decreases 5-HT turnover rate in Sr.

CONCLUSIONS

It is concluded that stress induces a decreased dopaminergic function and an increased serotonergic function in Sr but a decreased serotonergic function in PC. These results point to a differential regional effect of stress on serotonergic function, which may be due to an activation of different subpopulations of 5-HT receptors but they also point to a 5-HT-DA interaction which is also region specific. OFLO produces an increased DA turnover rate in Sr. This is in accordance with the GABA_A antagonistic effect of Quinolones which may result to inhibition of the action of GABA_A on nigrostriatal DA pathways. OFLO has no effect on aminergic transmission in PC but under stress conditions the decreased serotonergic activity is reversed by the drug. This applies to the striatal DAergic system as well, where OFLO not only counteracts the decrease of DA turnover rate but turns it to an opposite direction.