

## A differential neuromodulatory role for nitric oxide (NO) in anxiety and seizures: An experimental study

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Anxiety and seizures are pathophysiologically distinct neurobehavioral disorders with several commonalities. The role of NO as a neuromodulator substance in the brain has been widely suggested and the possibility of a regulatory role for NO in both conditions were explored. In experimental models of anxiety, the effects of NO modulators were examined in stress or theophylline induced anxiogenic responses by the elevated plus maze (EPM) test in rats. Pretreatment with the NO mimetic, glyceryl trinitrate, attenuated such stress and/or drug induced anxiogenesis whereas the NO synthase inhibitor, 7-nitroindazole, aggravated the response. Anxiogenesis, as evidenced by neurobehavioral suppression in EPM activity, was accompanied by increases in MDA levels and reductions in GSH and NO metabolite (NOx) activity in brain homogenates – changes which were reversed by NO mimetic pretreatment. In tests for seizures, theophylline alone and in combination with stress induced seizures and mortality at higher dose levels of the drug than that needed to induce anxiety. Interestingly, theophylline induced seizures and mortality in rats were antagonized by 7-nitroindazole pretreatment, whereas, the NO mimetic tended to potentiate seizures after subthreshold doses of the methylxanthine. Such drug induced seizures were accompanied by greater elevations in brain MDA levels, whereas, GSH levels were consistently lowered. Unlike that seen during anxiety, NOx levels were increased in brain homogenates in these rats. Further, the changes in oxidative stress markers were neutralized by 7-nitroindazole pretreatment. These pharmacological and biochemical data indicate that anxiety and seizures are two ends of a neurobehavioral spectrum, which are differentially modulated by NO.

### Biography

Arunabha Ray, M.D., Ph.D. is Chair in Pharmacology at the Vallabhbai Patel Chest Institute, Faculty of Medicine, University of Delhi, Delhi, India. He has more than 33 years of teaching and research experience at undergraduate, graduate and doctoral levels. He has held several important academic/research positions in the university during his illustrious career and has been the recipient of many honors and awards. He has been invited by several national and international universities/organizations to deliver lectures in his area of expertise. He has more than 150 research publications to his credit and has authored one textbook and edited four books.

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