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Animal models for screening anxiolytic agents

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ABSTRACT

The Animal models contribute to reveal the underlying pathophysiology of various psychiatric disorders. Furthermore, these models are useful not only in screening new compounds but also help in discovering new medicines based on reversing the underlying pathological deficiency. Since human life is precious, it becomes necessary to test the new medicines in small animals before applying to human beings. It is often difficult to produce psychiatric disorders in laboratory animals similar to human beings. Anxiety is a condition of persistent and uncontrollable nervousness, stress, and worry, which is characterized by feelings of apprehension, insecurity, uncertainty or fear. The animal models employed for screening anti-anxiety agents are basically of two types. First type of models are based upon spontaneous (unconditioned) responses and second type are based upon learned (conditioned) tasks. In the present review article, the authors have attempted to describe the principle, end point and rationale of each model employed for screening of anti-anxiety agents.

Key words : Anxiety, Models, Screening, Rodents

INTRODUCTION

Anxiety is a condition of persistent and uncontrollable nervousness, stress, and worry that is triggered by anticipation of future events, memories of past events, or ruminations over day-to-day events, with disproportionate fears of catastrophic consequences. It is characterized by feelings of apprehension, insecurity, uncertainty or fear. Anxiety is a term used to describe both a normal emotional state associated with stressful or difficult events and a pathological condition. When anxiety is chronic and is not clearly linked to well-defined events, it is generally considered abnormal and appropriate for psychological or psychiatric intervention. There are various types of anxiety disorders such as Generalized Anxiety Disorder (GAD)(Excessive, unrealistic worry that lasts six months or more), Obsessive-Compulsive Disorder (OCD) (Persistent, recurring thoughts or obsessions that reflect exaggerated anxiety or fears) Post-Traumatic Stress Disorder (PTSD) (Exposure to a traumatic event), Panic Disorders (Severe attacks of panic for no apparent reason) and Phobias (Extreme anxiety about being judged by others, or intense fear reaction to a specific object or situation such as spiders, dogs, or heights). Although many kinds of strategies have been applied, anxiety is currently most frequently treated with Anxiolytic medicines. Animal

models largely contribute to reveal the underlying mechanisms of anxiety disorders and help in screening and developing new medications. Animal models for psychopathology have become an indispensable tool in the analysis of the multitude of causes whether genetic, environmental or pharmacological, which bring about symptoms analogous to those of patients with a specific disorder. However, there are traditional difficulties in accepting these models because there is no direct evidence for concluding that what occurs in the brain of an animal is equivalent to what occurs in the brain of a human being. Often researchers fail to specify, whether they are looking for a correlation model. (e.g. predictive validity, a model that is selectivity sensitive to therapeutic agents), an isomorphic model (face validity, a model that implies that the behavioral response in humans and animals is the same) or an analogous model (true construct validity, a model that implies that the 'cause' of the behavioral response in animals is sufficient to provoke the same response in humans).

Experimental models:

The animal models employed for screening anti-anxiety agents can be broadly classified into two types:

- Models based upon spontaneous (unconditioned)

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