



Role of Dopamine in Anxiety Behavior

Shahin Mohammad Sadeghi^{1,2}, Sajad Sahab Negah^{1,3*}, Zabihollah Khaksar³, Hadi Kazemi^{1,4}, Hadi Aligholi¹,
Sayed Mostafa Modarres Mousavi¹, Amin Afsahi⁵

¹ Shefa Neuroscience Research Center, Khatam Alanbia Hospital, Tehran, Iran.

² Department of Plastic and Reconstructive Surgery, Shahid Beheshti University of Medical Sciences, Tehran, Iran.

³ Histology and Embryology Group, Basic Science Department, Veterinary Medicine Faculty, Shiraz University, Shiraz, Iran.

⁴ Pediatric Department, Shahed University, Tehran, Iran.

⁵ Health Office Expert in Tehran Municipality-District 20, Tehran, Iran.

Published: 1 Oct 2014

Abstract

The mesolimbic dopamine (DA) system contains both D1-like and D2-like receptors, has been connected to control of locomotor behavior. An apparent role for D1 and D2 receptors throughout the mesolimbic system in the alteration of locomotor behavior has been demonstrated in pharmacological studies. The nucleus accumbens (NAc) is comprised of a core and a shell subregion, which is a component of the mesolimbic DA system, and has been specifically implicated in locomotor behavior. Intra-NAc injections of D1 and D2 agonists have been found to increase locomotor activity. The DA system also plays a role in regulating anxiety-like and fear behavior. Pharmacological studies have shown that D1 and D2 receptors are involved in anxiety-like behavior. Findings seem to be dictated by a number of factors, including strain, route of administration, ligand selected and behavioral test. Fear behavior may often be indiscernible from anxiety-like behavior in animal models though the anatomical aspects may be different. Fear cues have been shown to decrease DA transmission in the NAc core, but increase transmission in the shell. Dopamine release in the NAc also appears to assist in encoding cues that predict punishment avoidance. These data suggest a role between fear and DA transmission and suggest that there may also be a role of accumbal DA in anxiety-like behavior.

Keywords: Dopamine, Anxiety, Locomotion, Nucleus Accumbens.

***Corresponding Author:** Sajad Sahab Negah

E-mail: sahabsajad@yahoo.com