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Title: Basal prolactin levels in rat plasma correlates with response to antidepressant treatment in animal model of depression

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<ABS-HEAD>Highlights ► Negative correlation between basal PRL level and response to IMI administration in the animal model of depression – chronic mild stress. ► Lack of correlation between basal PRL level and stress response ► Basal level of PRL may have a potential effect in the successfully treatment of depression

<ABS-HEAD>Abstract

<ABS-P>Prolactin (PRL) has been shown to be altered by psychotropic drugs, including antidepressant drugs (ADs). Many studies have focused on the response to antidepressant treatment (especially related to the serotonergic system) using the fenfluramine test (PRF), however some data suggest lack of correlation between PRF and prediction of clinical response to ADs.

<ABS-P>In our study we have investigated the hypothesis that basal plasma level of prolactin is a better predictor of antidepressant treatment. We have used Chronic Mild Stress (CMS) – the animal model of depression. Rats are exposed to CMS in combination with imipramine (IMI) treatment for 5 consecutive weeks. Blood samples were collected from the rat tail vein three times: before the CMS procedure, after 2 weeks of stress and after the complete CMS procedure (after 5 weeks of stress and IMI treatment). The PRL level in plasma was determined using the commercially available ELISA kit.

<ABS-P>In CMS, anhedonia in rats is manifested by reduced consumption of sucrose solution while administration of antidepressant drugs reverses anhedonia. Some animals (ca.30%) did not respond to antidepressant therapy and were considered treatment-resistant. There was no correlation between basal PRL levels and stress response, however, from the results obtained by Spearman Rank Correlation analysis we have observed a significant negative correlation between basal PRL levels before the CMS procedure and behavioral response to IMI administration. The obtained results indicate that the basal PRL level in rat plasma correlates with a good response to treatment in the animal model of depression.

<KWD>Keywords: basal prolactin level; chronic mild stress model; antidepressant response; correlation

<H1>1. Introduction

Hyperprolactinemia, usually defined as increased levels of prolactin (PRL), is one of the most common endocrine dysfunctions of the HPA axis. One of the clinical manifestation of hyperprolactinemia is a tendency to anxiety and depression. It has been shown – using different stressful conditions – that stress, which is major depression risk factor, has a biphasic effect on PRL secretion. PRL response to acute stress appears to be sensitive to the intensity of the experienced stress. When the animals were repeatedly exposed to the same stressor, some behavioral and physiological consequences of stress were reduced suggesting that the animals become adapted to the stimulus [1,2]. Serum prolactin levels are controlled by tonic inhibitory or stimulatory factors which

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