Sex hormone levels in drug-naïve, first-episode patients with psychosis

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Abstract: Sex differences have long been reported in schizophrenia leading to the hypothesis that sex hormones may be implicated in the pathophysiology of the disorder. We assessed gonadal hormones during the fasted state in drug-naïve patients with psychosis. Fasting serum concentrations of follicular-stimulating hormone (FSH) and luteinizing hormone (LH), testosterone, free-testosterone, Sex Hormone Binding Globulin (SHBG) and estradiol (E_2) were compared between a group of 55 newly diagnosed, drug-naïve, first-episode men with psychosis and a group of 55 healthy controls, matched for age, smoking status and BMI. Testosterone and free-testosterone levels were significantly lower in the patients' group and SHBG levels significantly higher in the patients' group compared to those in healthy controls. Testosterone, free-testosterone and SHBG were compared between a group of 32 drug-naïve, first-episode females with psychosis and a group of 32 healthy controls matched for age, smoking status and BMI. The groups had similar values in the hormones which were measured.

Results:

Male patients / Controls

The mean duration of untreated illness in our study population at the beginning of the study was 10.60 ± 6.78 weeks, as these patients were investigated during the acute phase of their illness. FSH levels in male patients were not statistically significantly higher compared to male controls. LH and E_2 levels were not also statistically significantly higher in male patients versus male controls whereas testosterone and free-testosterone levels were statistically significantly lower in the male patients' group compared to those in male controls and SHBG levels were statistically significantly higher in the patients' group.

Female patients / Controls

In the current study, we also compared Testosterone, free-testosterone and SHBG in a group of 32 drug-naïve, first-episode females with psychosis and a group of 32 healthy controls. The two groups had similar values in the hormones which were measured. The relationships between testosterone, free-testosterone and SHBG levels and psychopathology as expressed through the PANSS scale were analyzed using two-tailed Spearman's correlation test without any statistically significant correlation.

Discussion

In this study we found significantly lower levels of testosterone and free-testosterone and higher levels of SHBG in the drug-naïve, first-episode male patient group compared to healthy control male group, matched for age, smoking status and BMI. No statistically significant correlation was found between testosterone, free-testosterone and SHBG levels and psychopathology as expressed through the PANSS scale. There was no statistically significant difference in testosterone, free-testosterone and SHBG levels between females with psychosis and the control group. Our findings support the hypothesis that low testosterone levels may be implicated in the pathophysiology of the disorder in males. Testosterone binding to androgen receptors occurs especially in the hypothalamus and amygdala and to a lesser extent to hippocampus and frontal cortex. Its neuroprotective effects include regulation of neuroplasticity in hippocampus, neurogenesis, neuroregeneration, enhancement of neurotrophin expression, protection against apoptosis and beta-amyloid toxicity.