



SCHIZOPHRENIA Factsheet

October 2020

What are hormones? and how do they relate to schizophrenia?

Hormones are chemical messengers secreted by the endocrine glands. Hormones travel through the bloodstream to tissues and organs, and control most of the body's major systems including heart rate, metabolism, mood, sexual function, and growth and development.

Neuroactive steroids, including testosterone, dehydroepiandrosterone (DHEA) and its sulphide ester (DHEA-S), are important for brain development as they influence synaptic connectivity and neuronal differentiation. They influence dopaminergic, glutamatergic, and GABAergic neurotransmission that have been found to be dysregulated in schizophrenia.

Estrogen has been proposed to confer a protective effect for schizophrenia. Women generally have a later onset of schizophrenia than males with an increased risk after menopause (see the risk factor topic on sex differences). Estrogen levels drop over time, particularly with the onset of menopause. This protection may also mean that premenopausal women who develop schizophrenia may experience a less severe illness than males.

Prolactin is another hormone implicated in schizophrenia. It is a polypeptide secreted by the pituitary gland, and is involved in many biological functions including reproduction, pregnancy and lactation, and growth and development. Some medications, such as antipsychotics are among the factors that can affect blood prolactin concentrations. Increased prolactin (hyperprolactinemia) is associated with a variety of adverse effects, including risk of breast cancer, lack of menstruation, and early osteoporosis in women, and a lack of libido and erectile function in men.

Body weight is regulated by anorexigenic or appetite suppressing hormones (e.g. insulin, leptin, peptide YY, and cholecystokinin) and orexigenic or appetite stimulating hormones (e.g. neuropeptide Y, orexins, agouti-related peptide, galanin, and ghrelin). These hormones are mostly produced by adipose tissue (e.g. adiponectin, leptin, resistin, vaspin and visfatin) or by the gastrointestinal tract (e.g. cholecystokinin, glucagon-like peptide 1, ghrelin and peptide YY). Alterations in the production of appetite-regulating hormones might be present in psychotic disorders.

What is the evidence for hormonal changes in people with schizophrenia?

Moderate to high quality evidence finds a small to medium-sized increase in leptin levels, particularly in chronic patients taking second generation antipsychotics olanzapine and clozapine. There was a small to medium-sized effect of higher insulin levels and a trend effect of lower leptin levels in people with first-episode psychosis compared to controls. These effects were both significant in subgroup analyses of antipsychotic-naïve patients. The severity of negative symptoms was associated with increased effect size estimates for insulin. There may also be reduced adiponectin levels in patients taking clozapine or olanzapine, but no differences in other patients, including first-episode patients. There were also no differences in ghrelin, orexin, resistin, and visfatin in first-episode psychosis patients.

Moderate quality evidence found a large increase in prolactin levels in antipsychotic-naïve males with schizophrenia and a medium-sized increase in antipsychotic-naïve females with schizophrenia. There was also a medium to large increase in dehydroepiandrosterone-sulfate levels, with testosterone elevated only in first-episode psychosis patients and in patients during an acute relapse. There were no differences in dehydroepiandrosterone levels. We found no systematic review assessing estrogen levels in people with schizophrenia.

For more information see the technical table



NeuRA (Neuroscience Research Australia) is one of the largest independent medical and clinical research institutes in Australia and an international leader in neurological research.

Diseases of the brain and nervous system pose the greatest health, economic and social burden of any disease group because they are chronic, debilitating and have no known cures.

Medical research is the cornerstone of efforts to advance the health and wellbeing of families and the community. Our dedicated scientists are focussed on transforming their research into significant and practical benefits for all patients.

While we hope you find this information useful, it is always important to discuss any questions about schizophrenia or its treatment with your doctor or other health care provider.

HOW YOUR SUPPORT HELPS

We are able to make significant advances due to the generosity of countless people. Your donation allows us to continue to work towards transforming lives. For information on how you can support our research, phone **1300 888 019** or make a secure donation at neura.edu.au/donate/schizophrenia.