Language Disorders in Schizophrenic Female Patients, and its Relation with their Female Sex Hormonal Profile

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Background: To find out the language disorders in a sample of schizophrenic female patients. Also to explore the relationship between female sex hormone estradiol and language disorders in schizophrenic patients. Schizophrenic females show language disorders as a part of their overall cognitive impairment. The female sex hormone, estrogen, acts as a neuro-active hormone that is assumed to have effects on the central nervous system and specifically on the cognitive functions.
Subjects & Methods: This case-control study included 30 schizophrenic female patients who were admitted in Al Abasseia Psychiatric Hospital. It also included 15 healthy controls that were matched in age and education. They were assessed using: Psychiatric interviews, The Scale for the Assessment of Positive Symptoms, and Scale for the Assessment of Negative Symptoms, Serum estradiol level on 3 consecutive weeks and language and speech items of The Luria-Nebraska Neuropsychological Battery (LNNB) General and neurological examination were performed as well.
Results: There were statistically significant differences between both groups in all the clinical scales (receptive and expressive speech, reading and writing) of the LNNB as well as most of the factor scales covering a wide range of linguistic abilities. High estradiol levels were correlated with poor performance in speech and language scales.
Conclusion: Female schizophrenic patients had menstrual irregularities and hypo-estrogenism. They performed significantly worse on their linguistic abilities, receptive and expressive speech, reading and writing. Increased estrogen levels correlated with poor performance on the linguistic functions (receptive and expressive speech), including writing and reading domains in patients with schizophrenia.

Keywords: Schizophrenia, Language disorder, Female, Sex hormones.

Abbreviations:
SAPS: Scale for the Assessment of Positive Symptoms
SANS: Scale for the Assessment of Negative Symptoms
DSM IV R: Diagnostic Statistical Manual IV R
LNNB: Luria Nebraska Neuropsychological Battery
ECT: Electro Convulsive Therapy

INTRODUCTION

Schizophrenic patients show deficits in a variety of cognitive domains including executive functions, attention, memory and language. There is increasing evidence that such deficits are specific and selective. This is shown through distinct patterns of association and dissociation of performance across different cognitive tasks (Kuperberg and Heckers, 2000). Cognitive impairment in schizophrenia appears to be central to the illness and not secondary to drug effects or other symptoms (Szeszko, et al. 2002).

Among the most novel and fascinating effects of estrogen in the central nervous system are those on cognitive function. The largest concentrations of estrogen receptors-beta are in the hypothalamus, the amygdala, and the hippocampus (Shughrue and Merchenthaler, 2000). The neurotransmitter that estrogen up-regulates most profoundly is acetylcholine. It also effects the serotonergic, noradrenergic, and dopaminergic systems (McEwen, 2002). Another study (Sherwin and McGill, 2003) suggested that estrogen would have its most profound effects on memory, however this does not exclude the possibility that estrogen might influence other cognitive functions as well.

Early clinicians referred to many women with schizophrenia as suffering from "hypoestrogenism". Schizophrenic psychosis was said to be influenced by the natural variation of estrogen levels, both over a woman's cycle and over her lifetime (Jessen, et al. 2003). The early observations are especially important because they were made before the advent of modern antipsychotics. Dopamine blockade and subsequent release of prolactin inhibition lead to high prolactin serum levels. This resulted in downstream inhibition of ovarian estrogen secretion; that is secondary hypo-estrogenism (Grigoriadis and Seeman, 2002).

Recently (Bergemann, et al. 2008) did not find an effect of estrogen on verbal abilities. However they found an effect of estrogen on the comprehension of metaphori