

Clinical Markers in Schizophrenia Cognitive -Neuropsychological Review

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Introduction

The term cognition (mental abilities) describes the human brain's ability to learn, think, and process information. Cognition denotes a relatively high level of processing of specific information including thinking, memory, perception, motivation, skilled movements and language. It denotes a relatively high level of processing of specific information including thinking, memory, perception, motivation, skilled movements and language. The hippocampus contains the neural circuitry crucial for cognitive functions such as learning and memory [1]. Cognition refers to information-processing functions, including attention, memory, and executive functions (i.e., planning, problem solving, self-monitoring, and self-awareness). Functional cognition is the interaction of cognitive skills and self-care, and community living skills. It refers to the thinking and processing skills needed to accomplish complex everyday activities such as household and financial management, medication management, volunteer activities, driving, and work. Occupational therapy practitioners focus their interventions on the relationship between the client's cognitive skills, functional performance, and environmental context to enhance the daily life experience of individuals with cognitive impairment [2].

In human beings, cognitive functions correspond schematically to the brain processes of acquisition and exploitation of knowledge. Research in cognitive psychology and neurosciences is devoted to unraveling these complex processes that underlie several mental functions [3]. Cognitive disorders are mental conditions that interfere with a person's ability to think clearly and precisely. The types and severity of cognitive disorders vary, but most involve impairment in perception, memory, judgment, reasoning, and awareness. Cognitive disorders can also have a negative effect on how one acquires and processes new information [4].

Cognitive psychology has become an important discipline in the research of a number of psychiatric disorders. It has become an important area of research in a number of psychiatric disorders, ranging from severe psychotic illness such as schizophrenia to relatively benign, yet significantly disabling, non-psychotic illnesses such as somatoform disorder [5]. Cognitive deficits may result in the inability to: pay attention, process information quickly, remember and recall information, respond to information quickly, think critically, plan, organize and solve problems, initiate speech [6].

How is cognition impaired?

The following key components of cognition that could be impaired:

1. Simple attention-the ability to register and retain information
2. Reasoning-problem solving.
3. Executive skills and complex attention-planning, organizing, sequencing information.
4. Memory-learning, recall.
5. Visual spatial processing-recognizing visual patterns
6. Language-verbal fluency.

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- Psychomotor speed-ability to rapidly process and produce written and oral information [7].

Neuropsychological Findings

There exists at least a subgroup of schizophrenics who show significant indicators of brain damage. Such damage appears to be located most commonly in the anterior areas of the left hemisphere, but there also may be involvement of the anterior areas of the right hemisphere as well. Additionally, such damage can occur in the presence or absence of damage to other areas of the brain. Those schizophrenics with this damage are more likely to be seen as chronic schizophrenics whose problems reflect more negative systems. On the other hand the affective disorders may be associated with damage more to the right anterior rather than left anterior areas, although the evidence for such a theory is much weaker at present than is the evidence for brain damage in schizophrenia. Relating to disorders the development of the individual, however, provides some significant problems. There have been no longitudinal studies that prove that certain brain injury leads to these symptoms. Another significant issue is to recognize the difference of adult and child onset schizophrenia. It should be clear that any single neural mechanism should result in similar symptoms and development. Clearly, this is not the case with childhood and adult schizophrenia, where the age of onset varies considerably. Thus we are dealing with different mechanisms.

Age differences in clinical symptoms and characteristics

The signs and symptoms of schizophrenia in childhood re, at least to some extent, age dependent. The older the child, the more like "adult" schizophrenia the clinical profile, as the following results observed in more than 50% of population, [8](Tables 1-3).

Childhood schizophrenia has been described as consisting of characteristic motor and physical signs (hypotonia and motor dysfunction), perceptual signs (over-sensitivity to sensory stimulation and difficulty with selective attention), and signs of

| Symptom | Preschool | latency | adolescent |
|----------------------|-----------|---------|------------|
| Constricted affect | + | + | + |
| Perseveration | + | + | + |
| Good eye contact | + | + | + |
| Inappropriate affect | + | + | + |
| Anxiety | + | + | + |
| Fragmented thought | + | + | + |
| Hyperacusis | + | + | - |
| Monotonous voice | + | + | + |
| Loose associations | + | + | + |
| Neologisms | - | - | - |
| Echolalia | - | - | - |
| Illogicality | + | + | + |
| Mannerisms | + | + | + |
| Grimacing | - | + | + |
| Perplexity | + | + | + |
| Autism | - | - | + |
| Clang association | - | - | - |
| Incoherence | + | + | + |

Sig.,.05

Table 1: Symptoms scale

| Symptom | Preschool | Latency | Adolescent |
|------------------------------|-----------|---------|------------|
| Ambivalence | - | - | + |
| Delusions | - | - | - |
| Hallucinations | - | - | + |
| Poverty of speech | - | + | - |
| Poverty of content of speech | + | + | + |
| Paranoid ideation | - | - | + |

Table 2: Associated symptoms

| Characteristic | Preschool | Latency | Adolescent |
|------------------------------|-----------|---------|------------|
| Hybotonia | + | + | + |
| Brachcephaty | - | + | + |
| Long hands | - | - | - |
| Decreased muscle power | + | + | + |
| Decreased muscle mass | + | + | + |
| Hypercanthism | + | + | + |
| Soft velvety skin | + | + | + |
| Head height | - | + | + |
| Increased head circumstances | - | + | + |
| Prominent nasal bridge | - | + | - |
| Deep-set eyes | - | + | - |
| Short fingers | + | + | - |
| Lax elbows | + | - | - |
| Lax metacarpal/phranging | + | + | - |

Sig.,.05

Table 3: The physical characteristics

affective and psychic disturbance (blunting of affect and formal thought disorders).

Gender differences in cognitive deficits in schizophrenics

Schizophrenia is one of the most serious mental illnesses with about one in a hundred people developing the disorder over a lifetime. It is evidenced that men and women have different outcome of the disease in age of onset, symptoms, disease severity, and number of treatment [9]. Men show an earlier age at onset, higher propensity to negative symptoms, lower social functioning, and co-morbid substance abuse than that is women, whereas women display relatively late onset of the disease with more affective symptoms, [10].

While men and women have similar prevalence of Schizophrenia, most of studies demonstrated that female onset is typically 3 -5 years later than males. It is now accepted that men has a single peak age for onset which is between 21 and 25 years old and women have two peaks age of onset, one between 25 and 30 years old and another one is after 45 years old [11]. Men show an earlier age at onset, higher propensity to negative symptoms, lower social functioning, and co-morbid substance abuse than that is women, whereas women display relatively late onset of the disease with more affective symptoms. While the reasoning of sex differences in schizophrenia remains uncovered, in this mini review, we gathered recent discoveries in schizophrenia research and discussed gender-related factors in the process of the disease as well as response to treatment with a hope to provide some useful insight for sex-specific treatment for schizophrenia in the future [10].

The most significant findings of researches:

- Male schizophrenic patients Presented more deficits in cognitive functioning comparing to female patients in such domains as attention, verbal memory, and executive functions [12].
- In the study performed by Vaskinn, et al. [13] an analysis of gender differences was done for patients with schizophrenia and bipolar disorder. In both clinical groups a better performance in cognitive assessment was observed in female patients.
- Torniainen, et al. [14] analyzed differences between men and women suffering from schizophrenia in terms of cognitive functions and cognitive features. The female patients had less negative symptoms and performed better in processing speed and episodic memory. However men were better in tasks related to visuospatial working memory.
- More serious cognitive deficits in men suffering from schizophrenia in such domains as immediate and delayed memory. However, they did not differ from women in deficits of language, visuospatial memory and attention. Patients of both sexes with schizophrenia experienced more deteriorated performance than healthy controls on cognitive domains of immediate memory, language and delayed memory. Furthermore, male schizophrenic patients had more serious cognitive deficits than female patients did in immediate and delayed memory, but not in language, visuospatial and attention indices Han, et al. [15].
- Females displayed greater impairment on Attention and Conceptualization than males. Gender interacted with patient group for construction: females performed worse than males among inpatients and better among outpatients. Results may be related to the atypically early age of onset of females relative to males; attention to sampling and selection biases is needed in evaluating gender differences in cognition in schizophrenia [16].
- Brébion, et al. [17] examined 88 schizophrenic patients finding sex-specific associations between anxiety, depression, negative symptoms and cognitive functions. There was a correlation between verbal recall and fluency and negative symptoms in men, and between verbal recall and fluency and attention in women
- Albus, et al. [18] observed that female schizophrenic patients presented a lower impairment in tests of verbal memory and learning and male schizophrenic patients presented a lower impairment in spatial organization.
- Evidence for genetic and neurodevelopmental factors remains weak but support has garnered for the hypothesis that the sex differences in schizophrenia is involved gonadal hormones, such as estrogen, which plays possible neuroprotective roles in against schizophrenia pathology in women. The estrogen hypothesis is supported by late on set age and second incidence peak around menopausal age in women. Indeed, estrogen deficiency is highly related to severity of psychiatric symptoms in women during menopause. For example, female schizophrenia patients often have more severe symptoms in the low estrogen phase of their menstrual cycle [19].
- Gender differences can inform more effective and gender-specific pharmacological and psychotherapeutic treatment, such as drug dosage, side effects, and compliance [20]. Female patients show better treatment response than men [21].

Conclusion

The problem of gender and age-related differences in cognitive and neuropsychological functioning among patients in schizophrenia needs further investigation.

- Deficits in cognitive function - ranging from decreased attention and working memory to disrupted social cognition and language - are common in psychiatric disorders in general and in schizophrenics, in specialty.
- Recent research has identified numerous interacting causes - genetic, epigenetic, developmental and environmental - that collectively disrupt the cerebral and cellular networks integrating and modulating cognition.
- Several pharmacotherapeutic strategies for the restoration of cognition are under investigation but most drugs have only been evaluated in rodents, and there is limited positive feedback from the clinic.
- Age differences in schizophrenics is related significantly with onset of the symptoms and the clinical picture of this disorder relating to the developmental stage (preschool, latency, adolescence).

Consideration of gender differences in schizophrenia and other psychosis provides an important insight for understanding the sex-specific characterizes of the diseases onset, symptoms, and opportunity to deliver sex-specific treatments and care for schizophrenia patients. It is critical to present such knowledge or awareness to clinical services and researchers with the opportunity to develop interventions, which might work in a gender-specific preventative or prophylactic manner.

At present, the research on schizophrenia is clearer the other psychiatric disorders, and more convincing, but there is slowly accumulating a literature on the affective disorders.

References

1. Trivedi J, Cognitive deficits in psychiatric disorders: Current status. *Indian J Psychiatry*. 2006;48(1):10 -20.
2. Sharma T, Antonova L. Cognitive function in schizophrenia. Deficits, functional consequences, and future treatment. *Psychiatr Clin North Am*. 2003;26(1):25-40.
3. Yvette A, Lucette L, Alain L, Daniele B. impaired cognition and attention in adults: pharmacological management strategies. *Neuropsychiatric Dis Treat*. 2007;3(1):103-116.
4. Teleb A Al Awamleh, Ahmed, Aida. Gender differences in cognitive abilities. *Current Research in Psychology*. 2012;3(1):33-39.
5. Wobrock T, Falkai P, Schneider-Axmann T, Hasan A, Galderisi S, Davidson M. Comorbid substance abuse in first-episode schizophrenia: effects on cognition and psychopathology in the EUFEST study. *Schizophr Res*. 2013;147:132-139.
6. McGivern RF, Huston JP, Byrd D, King T, Siegle G J, Reilly J. Sex differences in visual recognition memory: support for a sex-related difference in attention in adults and children. *Brain and Cognition*. 1997;34(3):323 -336.
7. Kao YC, Liu YP, Lien YJ, Lin SJ, Lu CW, Wang TS. The influence of sex on cognitive insight and neuro-cognitive functioning in schizophrenia. *Prog Neuro-psychopharmacology Biological Psychiatry*. 2003;44:193-200.

8. Sheila C. Schizophrenia. In: LG. Cynthia, M. Hersen: Child Psychiatric Diagnosis. Wiley Series on personality Processes: Irving B. Weiner, Series Editor. Wiley. New York. 1989.
9. Nawka A, Kalisova L, Raboch J. Gender differences in coerced patients with schizophrenia. *BMC Psychiatry*. 2013;13:257.
10. Rena L, Xin M, Gang W, Jian Y, Chuanyue W. Why sex differences in schizophrenia? *J Transl Neurosci (Beijing)*. 2016;1(1):37-42.
11. Jones PB. Adult mental health disorders and their age at onset. *Br J Psychiatry*. 2013;54:5-10.
12. Goldstein JM, Seidman LJ, Goodman JM, Koren D, Lee H, Weintraub S. Are there sex differences in neuropsychological functions among patients with schizophrenia? *Am J Psychiatry*. 1998;155:1358-1364.
13. Vaskinn A, Sundet K, Simonsen C, Hellvin T, Melle I, Andreassen OA. Sex differences in neuropsychological performance and social functioning in schizophrenia and bipolar disorder. *Neuropsychology*. 2010;25:499-510.
14. Torniainen M, Suvisaari J, Partonen T, et al. Sex differences in cognition among persons with schizophrenia and healthy first-degree relatives. *Psychiatry Res*. 2011;188(1):7-12.
15. Han M, Huang XF, Chen da C, et al. Gender differences in cognitive function of patients with chronic schizophrenia. *Prog Neuropsychopharmacol Biol Psychiatry*. 2012;39(2):358-363.
16. Debora P, Steven M, Peter S, Jeanne T. Gender differences in cognition in schizophrenia. *Schizophr Res*. 1992;8(1):69-73.
17. Brébion G, Villalta-Gil V, Autonell J, et al. Cognitive correlates of verbal memory and verbal fluency in schizophrenia, and differential effects of various clinical symptoms between male and female patients. *Schizophr Res*. 2013;147(1):81-85.
18. Albus M, Hubmann W, Mohr F, et al. Are there gender differences in neuropsychological performance in patients with first-episode schizophrenia? *Schizophr Res*. 1997;28(1):39-50.
19. Grigoriadis S, Seeman MV. The role of estrogen in schizophrenia: implications for schizophrenia practice guidelines for women. *Can J Psychiatry*. 2002;47(5):437-442.
20. Drake R, Goldstein JM. Sex differences in schizophrenia. *Int Rev Psychiatry*. 2010;22(5):417-428.
21. Riecher-Rössler A, Häfner H. Gender aspects in schizophrenia: bridging the border between social and biological psychiatry. *Acta Psychiatr Scand Suppl*. 2000;407:58-62.