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A prospective study on neuropsychological assessment to identify subtype in patients with Schizophrenia

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Abstract
Background: Schizophrenia is a severe chronic mental disorder affecting person's ability to think, feel and behave. Such patients have lost touch with the reality. Cognitive deficiencies in schizophrenia are related with different symptom subtypes of schizophrenia.
Aims and Objective: To study the neuropsychological assessment of schizophrenia patients.
Materials and Methods: Forty schizophrenia patients with subtypes as paranoid (n=20) and non-paranoid (n=20) were studied. As part of this assessment comprehensive test battery was used to assess the broad range of cognitive functions like attention, language, executive functions, memory and processing of perception.
Results: Subjects with paranoid schizophrenia shows better performance than non-paranoid subjects on events of selective attention or executive function (Stroop Color-Word Interference Test) ($F=6.07$, $p<0.01$) and learning or /memory functions (Serial Digit Learning Test) ($F=8.43$, $p<0.00$).
Conclusion: Basic neurocognitive processes can be used to differentiate the difference between schizophrenia subtypes.

Keywords: paranoid schizophrenia, neuropsychological assessment, comprehensive test battery

Introduction

Schizophrenia is a severe chronic mental disorder with different subtypes basis of neuropsychological or specific symptoms of it. Subtypes can be classified based on the presence of positive or negative symptoms [1, 2].

Positive symptoms are psychotic behaviors which are not generally observed in healthy person such as hallucinations, delusions, thought and movement disorders. Negative symptoms include flat affect, reduced feelings of pleasure in everyday life, difficulty in beginning and sustaining activities and reduced speaking [3].

Patients with schizophrenia can further be subdivided in to paranoid or non-paranoid type. Previous studies have demonstrated that patients with paranoid schizophrenia have less impairment of neurocognitive functions compared to non-paranoid patients [4].

Previous studies have tried to differentiate between these two subtypes and found that paranoid schizophrenia performed significantly better on executive and learning /memory functions compared to non-paranoid patients. However they did not find any significant difference in other measures of neuropsychological functioning. Hoverer the significance results may be due to difference in gender and education [5].

Data is limited differentiating between the subtype of schizophrenia, hence present study we tried to differentiate the both the subtypes of schizophrenia using simple comprehensive test battery.

Material and Method

Forty patients with schizophrenia were studied who met the DSM IV criteria of schizophrenia. A written informed consent was obtained from each participant before starting the study.

Patients with history of any neurological or medical disorder, mental retardation, and alcohol/drug addiction in past 6 months were excluded. Patients receiving Electroconvulsive therapy (ECT) in past 6 months were also excluded from the present study.

A detailed interview was done to obtain the demographic details of the patients. Subjects were grouped in to paranoid (n=20, all male) and Non-paranoid (n=20, 13 male and 7 female). Bothe the groups were receiving the Chlorpromazine.

Neuropsychological test battery was administered to both the groups. These tests will evaluate the performance of attention, learning, memory, visual spatial perception, executive functions and language.

Clinical interview test battery was applied by the investigators experienced in assessment and working with psychotic patients. For testing a quite room was selected. Two sessions one hour of each was performed when the patient most cooperative and alert. During testing 65% of paranoid and 75 % of non-paranoid patients received haloperidol and 35% of paranoid and 25% of non-paranoid patients have received clozapine.

Tests included were, for Attention [Continuous Performance Test (CPT), Cancellation Test], for Learning and Memory [Serial Digit Learning Test (SDLT), Rey Auditory Verbal Learning Test (RAVLT), Wechsler Memory Scale III (WMS-III), Visual Reproduction Subtest], for Executive Functions [Category Fluency Test, Wisconsin Card Sorting Test (WCST), Raven Progressive Matrices Test (RPMT), Stroop Color Word Interference Test], for Language [Boston Naming Test] and for Visual-spatial Perception [Benton Judgment of Line Orientation Test].

We performed the Stroop Test which is a measure of executive function. It is also useful in assessing attentional matrix, specifically selective attention. Previous studies of

neurocognitive functioning in schizophrenia patients have viewed this test as a measure of selective attention [6].

All the data analysis was performed using IBM SPSS ver. 20 software. Data was first entered in the Microsoft excel 2010 file. Group demographic parameters were calculated using Mann-Whitney U test and Chi-square test. Multivariate analysis of variance (MANOVA) was also done to compare. P value of <0.05 is considered as significant.

Results

Mean age, duration of hospitalization, education, illness and the mean done of chlorpromazine in paranoid schizophrenic group was 37±8 years, 7±4 years, 15±7 years, 12±8 years and 859.65±362.23mg respectively. In non-paranoid schizophrenia group, Mean age, duration of hospitalization, education, illness and the mean done of chlorpromazine was 38±14 years, 8±6 years, 12±6 years, 14±9 years and 788.86±286.47 mg respectively. Mean education was higher in the paranoid group.

During the test patients in the paranoid group performed significantly better than the non-paranoid group on measures of executive functions and learning/memory. There were no significant differences between the two groups on other measures of memory measures of language and visuospatial perception functions.

On the Stroop test, paranoid subject made significantly fewer errors than non-paranoid subjects. Subjects with paranoid schizophrenia learned the digits faster than the non-paranoid subjects. In the paranoids ample average number of trials for learning was considerably lower than in the non-paranoid sample.

No differences were observed in performance of male and female subjects on the measures of neuropsychological functioning in the non-paranoid patients, though a trend of differences observed in the RAVLT with p=0.055, F=3.51, in the category fluency test with p=0.69, F=3.40, in the WCST with p=0.06, F=3.77, and the Stroop test with p=0.06, F=3.72.

Discussion

Major findings of this study were that patients with paranoid schizophrenia performed better on executive and learning / memory functions, no differences observed other measures of neuropsychological functioning. Statistical assessments shown that the observed group performance differences were not due to gender or education, but if the education factor is statistically controlled, the non-paranoid group was weakened on executive and memory functions. Findings of this study also supports the previous studies which has similar findings like, the patients with paranoid schizophrenia performed better than non-paranoid patients [7]. One of the significant group differences was observed in the number of errors on the Stroop Test, which is consistent with reports of studies demonstrating that patients with paranoid schizophrenia performed better on the Stroop Task [8]. There were no major differences between the two samples on other measures of executive function like Category Fluency Test, WCST and Raven Progressive Matrices Test. Our findings are also like to those of Kremen *et al.* who found no differences between the two groups on WCST performance [9].

Current study found that the subjects with paranoid schizophrenia did not differ from non-paranoid subjects on spatial distribution of attention, language, and visuo-spatial perception functions. This is contrast to the previous study by Zalewski *et al.* who have evaluated attentional and verbal skills and suggest subtype differences bur he recorded a little evidence to suggest that subgroups differed on measures of visuo-spatial ability [1].

Findings of this study are supported by the Kremen *et al.* [9], who found no differences between groups on the CPT and the Cancellation test. Current study is conducted on a small sample size which decreased the power of the statistical analysis also various aspects were not considered like illness severity, general IQ and clinical status, chronicity of illness. This study did not include the healthy subjects as a control group and the cognitive functions between paranoid and non-paranoid schizophrenia were compared in a cross-sectional study design. Due to these limitations results of this study are suggestive rather than conclusive

Conclusion

Findings of this study shows that the cognitive differences in schizophrenia could be used as sign of the underlying neurocognitive processes and subtypes of schizophrenia.

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