Original article

The Relation between Metacognitive Beliefs and Mild Neurological With Positive and Negative Symptoms in Patients with Schizophrenia

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ABSTRACT

Background:Schizophrenia is one of the most important mental disorders that in comparison with other mental disorders, leaves the most devastating effect on person's life and social health.
Objectives:In this research we determinerelationship between metacognitive beliefs and mild neurological symptoms with positive and negative symptoms of schizophrenia.
Patients and Methods:This was a correlation type study conducted on80 patients with Schizophrenia were randomly selected among patients who referred to Fatemi and Isaar hospitals in Ardebil, Iran from 2013 to 2014.Meta-cognitive impairment and mild neurological soft sing were measured with meta-cognitive questionnaire test and neurological soft symptoms respectively and positive and negative symptoms of schizophrenia were measured with positive and negative symptoms of schizophrenia test too.
Results:The average and standard deviation of meta-cognitive beliefs were x=74/54, SD=14/32 respectively, the average and standard deviation of mild neurological soft symptoms were x=19/93, SD=8/26 respectively, the average and standard deviation of positive symptoms were x=49/55, SD=7/27 respectively, and the average and standard deviation of negative symptoms were x=46/76, SD=6/34 respectively. Meta-cognitive beliefs with positive symptoms (R=0.41) and negative symptoms (R=0.33) has a meaningful positive correlation (p <% 1) but any meaningful relation between mild neurological symptoms and positive and negative symptoms was not found.
Conclusions: The results of this study indicated that Meta cognitive beliefs with positive and negative symptoms of schizophrenia have a meaningful relation, but there is no relation between the weak neurological symptoms and positive and negative symptoms.

Keywords:Schizophrenia; Meta-cognition; Meta-cognitive test questionnaire; Soft signs of neurological tests; Neurological symptoms

Introduction

Schizophrenia is a major mental disorder compared with other mental disorders leaves the most devastating impact on social health and life. Given that schizophrenia is usually chronic and life remains its financial, social and psychological costs are too much. Positive and negative symptoms in schizophrenia patients as a main feature are one of the variables that affect their behavior, skills and functions. Positive symptoms include over behavioral functions such as illusions, delirium, strong behavior and impaired thinking. These symptoms represent extreme deviation from normal behavior. Negative symptoms include behavioral defects that include poverty of speech, superficial affection, incuriosity, speculation and attention deficit. These symptoms impliesin normal routine functions. However, it seems that positive and negative symptoms are not related to each other and represent different processes that may occur simultaneously, however this conclusion is controversial (1). Cognitive impairment in schizophrenia is of great importance in etiology, typology and treatment of schizophrenia patients. One of the variables that affect the formation of positive and negative symptoms is Meta cognitive beliefs. Meta cognition is one of the basic variables that impaired in schizophrenia and have significant impact on positive and negative symptoms of schizophrenia (2). Meta cognition may play a

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fundamental role in the transition of positive symptoms particularly illusion and delirium (3). According to the evidence schizophrenic patient's compared with other patients and non-patients have more impaired Meta cognition (4, 5). The results of a research show that there was no significant correlation between positive symptoms and neurological signs but there is a direct correlation between negative symptoms and mild neurological signs. Although the negative symptoms predict poor performance in neuropsychological assessment however there is a casual relation between symptoms and course of neuropsychological functioning in patients with chronic schizophrenia (6). Also, there was no significant relation between neurological damage and positive symptoms but negative symptoms were significantly related to neurological damage (7).

Objectives

Due to existence of different and contradictory results and little research in this area particularly lack evaluation of the combination of these three variables and importance of these variables in the diagnosis and prognosis of disease, this study is important. In this study first, attempted to characterize the relationship between cognitive beliefs and mild neurological symptoms with positive and negative symptoms of schizophrenia. Then positive and negative symptoms of schizophrenia may explain the mild neurological signs and cognitive beliefs.Also, cognitive and Meta cognitive and neurological symptoms considered predictor variables and positive and negative symptoms considered as criterion variables.

Patients and Methods In this Correlation study was approved by Ardabil University of medical sciences, 80 patients with Schizophrenia were randomly selected among patients who referred to Fatemi and Isaar hospitals in Ardebil, Iran from 2013 to 2014. At least 30 people have been selected proposed to study the correlation between the numbers of subjects (36). Given that we have 30 subjects per predictor variable, is needed to enhance the credibility of the go out of 80 subjects were selected.

MeasuresShort test of cognitive

Short test of cognitive (8) include question in different fields that measure cognitive condition of person examined. The retest stability factor after 24 hour with the same examiner was 0.89 and for 2 examiners was 0.83.reliability coefficient of moment in 28 days was 0.98. Amini and partners (9) report the reliability and validity of this question satisfactory.

Metacognitive questionnaire

The short form of Meta cognitive (10) has 30 items and each participant answer to this 5 optional items (not agree, somewhat agree, moderately agree, so agree). Cranach's alpha coefficient is 0.93, and the retest stability factor is 0.78. Its correlation coefficient with trait anxiety inventory - spill burger condition: 0.53, pen condition questionnaire: 0.54 and obsessive - act disorders questionnaire of Padua is 0.49 ($p< 0.01$) . In study that Ibrahim zade (11) has done in order to validate the Meta cognitive questionnaire, internal consistency coefficient was 0.83. Also the measures of perfectionism (0.38) and uncertainty (0.65) with a correlation coefficient test obtained meaningful. The average scores of this questionnaire in anxious patients were more meaningful than healthy persons. Cranach's alpha coefficient of this questionnaire was 0.85 in this study

.**Neurological assessment scale**

Neurological assessment scale was made by Bucanon and Hayricks (12). This scale includes 26 items of slight neurological signs about sensory integration, motor coordination and sequence of complex actions and etc that each of them grading like 0, 1 or 0, 1, 2. The retest stability of this test after one month obtained 0.75. 3.1.4. Positive and negative symptoms scale for schizophrenia

This scale was made for assessing positive and negative symptoms in schizophrenia patients. this scale offered by key , Opler and Fisben (13) that has got 40 items and each participant answer to this 5 optional items (from quite naturally to quite sever) . Cronbach's alpha coefficient of this scale was reported 0.83 . The correlation coefficient of this scale with positive and negative Ndryazn symptoms is 0.58. Abolghasemi (14) reported Cronbach's alpha coefficient of this questionnaire 0.80.

Results

Results of these study shows most of all participants were single (72.5%), 35% of patients were employed. 25% of participants were first child, 15% second child and 16% third child of family. 18.8% of patients have secondary degree, 15% high school degree, 47.5% diploma and 11.5% have upper diploma degree. 32.5% have family history of mental illness, 3.8% used old antipsychotic drugs, 37.5% used new antipsychotic drugs and 58.8% used both the old and new psychotic drugs. Table 1 shows the Average and Standards Deviation of Cognitive Impairments, Slight Neurological Signs, Meta cognitive, Positive and Negative Symptoms inPatients with Schizophrenia.

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Pearson correlation coefficient used for connection between cognitive states, Meta cognitive and slight neurological signs with positive and negative symptoms. As we see in table 2, Meta cognitive with positive symptoms (r=0.41) and with negative symptoms (r=0.33) have positive meaningful correlation (p<0.01). Cognitive impairments with positive symptoms (r=0.44) and negative symptoms (r=0.40) had positive meaningful correlation (p<0.01). But there were no meaningful correlation between slight neurological with positive and negative symptoms.

To determine the effect of cognitive impairments, meta cognitive and slight neurological signs on positive symptoms, cognitive impairments, meta cognitive and slight neurological signs variance as predictor variables and positive symptoms as the criterion variable in the regression equation . As we seen in table 3, "F" rate is statistically significant (P<0.001) and about 38% of the variance associated with negative symptoms is explained by these variables.

To determine the effect of cognitive impairments, meta cognitive and slight neurological signs on negative symptoms, cognitive impairments, meta cognitive and slight neurological signs variance as predictor variables and negative symptoms as the criterion variable in the regression equation. In chart number 4 the "F" rate is statistically significant (P<0.001) and about 30% of the variance associated with negative symptoms is explained by these variables.

Discussion

The result of this study showed that there is a positive relation between cognitive impairments and positive and negative symptoms of schizophrenia. This result is in line with Kolakowska and Colleagues (15), Addington and Colleagues (16) and mokhber (17); but it isn't in line with fadaei (18) finding. In fadaei's research paid attention to the role of drugs in reducing positive symptoms like delirium and suspicion. While in this study the type and dose of drugs is uncontrolled (18). The difference between this study and fadaei's study can be result of using the assessment tools of positive and negative symptoms. The results shows, Meta cognitive have a meaningful relation with positive and negative symptoms of schizophrenia that it has stronger correlation with positive symptoms. The study is in line with other research findings (3,14,19,20, 21,22). The result of these studies have shown that Meta cognitive has significant correlation with positive symptoms especially Delusionsandhallucinations. This result is potentially concerned with self-regulatory executing function model of wells, according to this model, people with high self-focus are more vulnerable than other psychological disorders. These findings also congruent with this state of Bentall (23) the role of Meta cognition may be important in the formation of Delusionsandhallucinations. In this study these results are in consistent with the studies of Kenny and Colleagues (25), Keshavan and Colleagues (24), Scheffer and Colleagues (26), (24) and Bowie and Harvey (27). These researches have shown the relation between slight neurological signs and positive and negative symptoms of schizophrenia patients. Since in the present study, these patients have the least neurological damage and between positive and negative symptoms and slight neurological signs, there is no relation, can be stated that minor neurological disorders, are epidemic and trivial physical anomalies that thoughts damage reflect are between cortical and sub-cortical areas or between different parts of the cerebral cortex (9). Focal neurologic signs are not specific and not related to any injury to the nervous system. Several reports indicated that slight neurological signs in schizophrenia are prevalent (28). The result of this study is corresponding with the research result of Hosseini and Colleagues (28) and Amini and Colleagues (9). Since slight neurological signs are pre underline of schizophrenia and these sings present in person before psychosis. Because of that, slight neurological signs cannot have significant relation with positive and negative symptoms. And positive and negative symptoms are associated with brain structures and neurotransmitters. Although there is a relationship between symptoms of schizophrenia and neuropsychological test performance, But a consistent` pattern of association is not seen. Also, long time medication use by patients can prevent the appearance of neurological symptoms. The results showed that cognitive impairments , Meta cognitive beliefs and slight neurological as the best predictors, indicate about 38% of positive symptoms variance from this amount, 19% share of the cognitive impairments, 16% share of Meta cognitive beliefs and 3% share of slight neurological signs. However, cognitive impairments, Meta cognitive beliefs and slight neurological as the best predictor, indicate about 30% of symptoms variance. From this amount.16% share of cognitive impairments, 10% share of Meta cognitive beliefs and 4% share of slight neurological signs. These results show that cognitive impairments are more effective on positive symptoms of schizophrenia. Also these result show that there are other psychological variables that involve in explaining the positive and negative symptoms of

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Table 1. Average and Standards Deviation of Cognitive Impairments, Slight Neurological Signs, Meta cognitive, Positive and Negative Symptoms inPatients with Schizophrenia

variable	mean	standard deviation
cognitive impairments	22.44	4.54
slight neurological signs	19.93	8.36
Meta cognitive	74.58	14.32
positive symptoms	49.55	7.37
negative symptoms	46.76	6.43

Table 2. Cognitive Impairments, Meta Cognitive and Slight Neurological Signs (correlation coefficient) with Positive and Negative Symptoms inPatients with Schizophrenia

variable	Positive symptoms	Negative symptoms
cognitive impairments	0.44 **	0.40 **
slight neurological signs	0.15	0.17
Meta cognitive	0.41 **	0.23 *

** P value <0.01, * P value <0.05

Table 3. Positive Symptoms Regression Analysis on Cognitive Impairments, Metacognitive and Slight Neurological Signs inPatients with Schizophrenia

Predictor variables	SS	dF	MS	F	R	R2	SE	B	Beta	T
Cognitive impairments	815.99 3479.82	1 78	815.944 .61	18.30 0.001	0.436 0	0.190 0	0.866 0	0.708 0	0.436 0	4.28 0.001
slight neurological signs	1637.31 2658.5	3 76	0.9815 44.61	18.28 0.001	0.59 0	0.348 0	0.047 0	0.205 0	0.398 0	4.32 0.001
Meta cognitive disorders	1495.08 2800.71	2 77	747.5 36.37	20.55 0.001	0.617 0	0.381 0	0.081 0	0.164 0	0.186 0	2.02 0.05

T: meaningful test for Beta coefficient
P: determine the significant level
Beta: regression coefficient
B: Beta coefficient
SE: standard error of estimate
R2: the coefficient of multiple determinations
R: multiple correlation coefficients
F: R and R2 significant test
MS: mean squares
dF: degrees of freedom
SS: sum square

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Table 4. Negative Symptoms Regression Analysis on Cognitive Impairments, Meta cognitive and Slight Neurological Signs in in Patients with Schizophrenia

Predictor variables	SS	dF	MS	F	R	R2	SE	B	Beta	T
Cognitive impairments	519.87 2742.66	1 78	519.87 35.16	14.79 0.001	0.399 0	0.159 0	3.37 0.147	0.565 0	0.399 0	3.85 0.001
slight neurological signs	856.04 2406.45	2 76	428.02 31.25	13.70 0.001	0.512 0	0.262 0	0.044 0	0.144 0	0.321 0	3.28 0.002
Meta cognitive disorders	986.97 2275.52	3 76	328.99 29.94	10.99 0.001	0.550 0	0.303 0	0.075 0	0.157 0	0.204 0	2.09 0.04

T: meaningful test for Beta coefficient
P: determine the significant level
Beta: regression coefficient
B: Beta coefficient
SE: standard error of estimate
R2: the coefficient of multiple determinations
R: multiple correlation coefficients
F: R and R2 significant test
MS: mean squares
dF: degrees of freedom
SS: sum squares

schizophrenia. It can be stated that the damages caused neuropsychology disorders and damage in some areas, resulting clinical signs, neurological and behavioural problems and finally caused positive and negative symptoms in patients. With that in mind, education, age and type of medication have not been under strict control; generalize the results, maybe somewhat limited.

Thus the present results with respect to the side of caution and with special attention to each research specific restrictions, is needed to generalize them. Attention to importance of cognitive, Meta cognitive and neurological impairments in the diagnosis and treatment are the implicit applications of this research.

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Authors Contribution

Study concept and design: RV. Analysis and interpretation of data: VR and PM. Drafting of the manuscript: AE and RM. Critical revision of the manuscript for important intellectual content: VR, PM, AE and RM. Statistical analysis: VR and PM.

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