Risperidone Effectiveness of Improvement Cognitive Function in Mini Mental State Examination and Clock Drawing Test in Schizophrenic Patients

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Abstract
Risperidone is a second-generation antipsychotic medications that can significantly improve cognitive function in schizophrenic patients. The objective of the present study is to determine the effectiveness of risperidone on cognitive function for improving the Mini Mental State Examination(MMSE) and Clock Drawing Test (CDT) scores. A total of 30 samples of schizophrenic patients who received risperidone treatment (27 men and 3 women), attending the outpatient in mental health hospital in Sumatera Utara, autoanamnese undergo direct interview using a measurement scale BPRS then undergo examination MMSE and CDT scores, the study was conducted for 8 weeks (pre and post test). From this study found that the risperidone effectively improves cognitive function in schizophrenic patients based on the presence of significant differences in MMSE and CDT scores (p = 0.0001).
Keywords: MMSE and CDT scores, risperidone, schizophrenia

1. Introduction
Using second-generation antipsychotic medications can significantly improve cognitive functioning in schizophrenic patients (Herrmann et al, 1999; Arana et al in handbook of psychiatry, 2000; Barkic et al, 2003; Muller et al, 2005; Golberg et al, 2007; Marder et al in Kaplan & Sadock's, 2009; Dania, 2009). Schizophrenic patients showed a high correlation with MMSE average of 0.40 until 0.54. The validity of the measurements should be tested by determining cooperation with other neuropsychological tests that are widely used to assess cognitive function in schizophrenic patients. CDT is sensitive enough to detect cognitive impairment attached to in schizophrenia, also in addition to correlate with the severity of symptoms (Bozikas et al, 2002; Bozikas et al, 2004).

2. Subject and Methods
This study was approved by the Research Ethics Committee of Medical Faculty University of Sumatera Utara. This study was performed in Mental Hospital of Province of North Sumatera, on the regulation of Medical Faculty of University of North Sumatera, from of March 1, 2010 until August 31, 2010. The criteria inclusion for subject were age 20 – 50 years old, meet the criteria PPDGJ-III, willing as research subjects, first contact with the researcher, and co-operative acute phase . We excluded of patients with schizophrenia are common and comorbid medical illness or other psychiatric disorders, state of pregnancy and lactation, hypersensitivity to risperidone, not graduated from high school / equivalent. Written informed consent was obtained from all participants after giving a full explanation of the study protocol. Autoanamnese undergo direct interview using a measurement scale BPRS then underwent MMSE and CDT. The results of the measurement scale BPRS, MMSE and CDT scores at baseline before treatment than after the eighth week of treatment.

2.1 Assessment and Rating
First, the patient will be measured using the BPRS severity, then the patient will undergo the MMSE and CDT in the acute phase before getting treatment interventions. Thirty samples will be interfered with risperidone. Every two weeks the patient was observed and the dose titrated. The initial dose of risperidone 2 mg / day every 2 weeks was observed and the dose titrated slowly until it reached 4 mg/day for 8 weeks. If the patient does not achieve clinical remission after 2 weeks of administration of risperidone, the patient was considered unresponsive to treatment with risperidone and excluded in this study. Furthermore, the patients will be given treatment with other antipsychotics. During the study, additional drugs may be administered to the patient is limited to trihexypenidyl a dose of 4 mg/day(split into two feedings). Then re-examination in the eight week, to assess the severity of schizophrenic patients used a scale of measurement to assess the BPRS and improvement of cognitive function used MMSE and CDT scores. Assessment results MMSE and CDT scores at baseline before treatment with after the eighth week of treatment assessed whether there was an improvement. MMSE scores had been translated in Indonesian of 21-26 as mild, moderate 10-20, further <10 (Wibisono, 2003) and CDT scores consisting of drawing circle hours maximum value 1, writing correct clock rate maximum value 1, putting numbers correct hour maximum value 1, shows clockwise corret maximum value 1. Total score of 4.

CDT which has been modified (Martina, 2010).

2.2 Statistical Analysis

Analytical studies with experimental approaches One group pre test - post test design to see the effect of improving the effectiveness of risperidone on scores Mini Mental State Examination and the Clock Drawing Test in schizophrenic patients. The results of MMSE and CDT scores at the time before and after treatment incorporated into the data and then tabulated and processed. Statistical analysis using the chi-square. Processing and data analysis using SPSS statistical test. From the independent t-test values seen no significant difference between the mean value comparison 2 groups of BPRS, MMSE and CDT before and after (p = 0.001).

3. Result

Table 1. Distribution of the study sample based on demographic characteristics.

Varibel	n	%
Age		
21 – 30	12	40,0
31 – 40	**13**	**43,3**
41 – 50	5	16,7
Gender		
Male	**27**	**90,0**
Female	3	10,0
Level of education		
High School / equivalent	**26**	**86,7**
Higher Education	4	13,3

From table 1. sample is at most 31-40 year age group were 13 persons (43.3%), male gender as many as 27 people (90%), education level of high school / equivalent were 26 people (86.7%).

Table 2. Statistical sample pairs

	n	*Mean*	**Standard deviation**
BPRS 1	30	39,00	2,5
BPRS 8	30	16,93	2,3
MMSE 1	30	15,40	3,2
MMSE 8	30	24,53	3,0
CDT 1	30	1,37	0,5
CDT 8	30	3,47	0,6

From table 2. Observed that of the T-test idenpendent: Average value of the first week of BPRS = 39.0 (SD 2.5), MMSE = 15.40 (SD 3.2), and CDT = 1.37 (SD 0.5). Average value of the eighth week of BPRS = 16.93 (SD 2.3), MMSE = 24.53 (SD 3.0), CDT = 3.47 (SD 0.6).

Table 3. Samples test of different pairs

	Mean	**Standard deviation**	*P**
BPRS1-BPRS8	22,07	3,00	0,00
MMSE1-MMSE8	-9,13	4,56	0,00
CDT1-CDT8	-2,10	0,71	0,00

P** *independent samples test

From table 3. Independent t-test shown no significant difference between the mean value comparison 2 groups of BPRS, MMSE and CDT before and after p = 0.001

4. Discussion

This study shows that the effectiveness of risperidone may improve cure rates of schizophrenic patients using a measurement scale BPRS and may improve cognitive function using the MMSE and CDT screening tool. The results of this study can't directly express the effectiveness of risperidone may improve cognitive function or as a whole can be assessed that the schizophrenic patients, the better the better the prognosis will also cognitive function.

The results of this study are not in accordance with the results of study that shows the CDT test is more sensitive to cognitive impairment than the MMSE (Herrmann et al, 1999). The results of this experiment are also

not consistent with studies showing schizophrenic patients showed a high correlation with the MMSE, but there is a change in the administration of medication cognitive function (Bozikas et al, 2002 and Bozikas et al, 2004).

5. Conclusion

From the this study it was found that risperidone effectively improves cognitive function in schizophrenic patients based on the presence of significant differences in MMSE and CDT scores (p = 0.0001).

Treatment of schizophrenic patients should pay attention to cognitive dysfunction. Provision of atypical antipsychotics may be considered to improve cognitive function in schizophrenic patients.

References

Departemen Kesehatan R.I Direktorat Jenderal Pelayanan Medik (1993), Pedoman Penggolongan dan Diagnosis Gangguan Jiwa di Indonesia III (PPDGJ III). Jakarta

Taylor EJ (1988), ed. Dorland's Illustrated Medical Dictionary

Stahl SM (2000), Essential psychopharmacology. Neuroscientific Basis and Practical Applications 2nd. Cambridge University Press; p.365-99

Sadock BJ, Sadock VA (2007)., Schizophrenia. Dalam: Kaplan & Sadock;s. Synopsis of psychiatry. 10th ed. Philadelphia: Lippincott Williams & Wilkins; p. 117-31

Sadock BJ, Sadock VA (2009). Comprehensive textbook of psychiatry, Vol. 3, 9th ed. Philadelphia: Lippincott Williams and Wilkins; p. 3214-21

Arana GW, Rosenbaum JF (2000). Antipsychotic Drugs. In: Handbook of psychiatry. 4 th ed. Philadelphia: Lippincott Williams & Wilkins; p.6, 35

Keefe RS (2007), Cognitive deficits in patients with treatment schizophrenia: Effects and treatment. J Clin Psychiatry; 68 (14): 8-13

Goldberg TE, Golman ES, Burdick KE, Malhotra AK, Lencz T, Patel RC et al (2007), Cognitive improvement after treatment with second generation antipsychotic medicaton in first episode scizophrenia.: Arch Gen Psychiatry; 64 (10): 1115-22

Muller U, Werheid K, Hammerstein E, Jungman S, et al (2005) Prefrontal cognitive deficits in patients with schizophrenia treated with atypical or conventional antipsychotics. Europhean Psychiatry 20; p.70-73

Barkic J, Filakovic P, Grguric LR, Koic O, Laufer D, Pozgain I, et a(2003). The influence of risperidone on cognitive functions in schizophrenia. Coll. Antropol 27 Suppl 1; p. 111-18

Dania IA (2009), Perbandingan efek risperidon dan haloperidol terhadap fungsi kognitif pasien skizofrenik; KONAS VI di Manado, Sulawesi Utara

Herrmann N, Kidron K, Shulman KI, Kaphlan et a (1999), The use of clock test in schizophrenia. General hospital psychiatry 21; p. 70-73

Folstein MF, Folstein SE, and McHugh PR (2000), *Mini Mental State Examination (MMSE)*. In: Task force for The handbook of psychiatric measures. 1th ed. American Psychiatric Association; p.422-27.

Bozikas VP, Kosmidis MH, Kuortis A, Gamvrula K et al (2002), Clock drawing test institutionalized patients with schizophrenia compared with Alzheimer's disease patients. Schizophrenia research 59; p.173-79

Bozikas VP, Kosmidis MH, Gamvrula K, Hatzigeorgadou M, et al (2004), Clock drawing test in patients with schizophrenia. Psychiatry research 121; p. 229-38

Bazire S (2005), Psychotropic Drug Directory 2005. The professionals' pocket handbook and aide memoire

Tuokko H et al, and Freedman et al (2000), *Clock Drawaing Test (CDT)*. In: Task force for The handbook of psychiatric measures. 1 th Ed. American Psychiatric Association; p. 438-41

Nasrun MWS (2010), Seminar psikiatri pemeriksaan MMSE dan CDT untuk gangguan fungsi kognitif. Medan, Sumatera Utara.

Marder SR, Hurford IM, Van Kammen DP (2009), Second generation antipsychotics. In: Sadock BJ, Sadock VA, eds Kaplan & Sadock's comprehensive textbook of psychiatry. 9 th ed. Vol.1 Philadelphia : Lippincott Williams & Wilkins; p. 3206-21

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