

COMPARISON OF MONTREAL COGNITIVE ASSESSMENT INDONESIAN VERSION (MOCA-INA) SCORE BETWEEN NORMAL BODY MASS INDEX AND OBESITY IN SCHIZOPHRENIC PATIENTS THAT RECEIVED RISPERIDONE

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ABSTRACT

Studies have reported that up to 60% of individuals with schizophrenia are overweight or obese. A total 56 participant's diagnosis of schizophrenia who admitted to psychiatry hospital and receiving risperidone 4 mg/day. This study is a comparative analytic study with a cross-sectional approach. The assessments included an interview to obtain sociodemographic data, of Montreal Cognitive Assessment Indonesian version scale (MoCA-Ina) were examined, for difference based on the following body mass index (BMI) categories: normal body mass index (BMI 18,50-24,99) and obesity (BMI ≥25). The results of the analysis using the Mann Whitney U test showed that there were significant differences between the mean of MoCA-Ina score based on body mass index subject with a value of $p = 0.015$

Keywords: *Schizophrenia, body mass index, Montreal Cognitive Assessment Indonesian version (MoCA-Ina), risperidone*

1. INTRODUCTION

Obesity is a problem commonly experienced by people with psychotic disorders, where the percentage in this population 40%-60% is overweight or obese, compared with the general population which is around 35%. Other studies have shown that the prevalence of obesity in schizophrenic patients is 3 times greater than in the general population. This is caused by unhealthy food and lifestyle, the direct effect of treatment with antipsychotics or a combination of these factors. People suffering from schizophrenia show a decrease in exercise activity and eat less healthy foods than the general population.^{1,2}

A study in China, 896 patients with schizophrenia, 54 percent of those with an overweight body mass index (BMI) and obese were found. There is a significant difference of scores on the visual reproduction subscale using Wechsler Memory Scale-Revised (WMS-R) based on body mass index of subject with normal BMI and overweight and obesity. Scores on the symbol subscale and composite z score on Wechsler Adult Intelligence Scale-Revised (WAIS-R), significant scores on Trail Making Test B, the visual subculture of WAIS-R reproduction (p value <0,05).³

In a study at Boston University, Department of Mathematics and Statistics, Statistic and Consulting Unit, with male subjects ($n = 551$), females (872) showed that in men with obese reported more difficulty in terms of cognitive performance using Kaplan-Albert Neuropsychological Test Battery on logical memory-immediate recall subscale, visual reproduction, digit span backward, word fluency, and logical memory-delayed recall.⁴

In a study (Fergenbaum, et al., 2009) in Canada, 207 subjects showed that cognitive function in patients assessed using Trail Making Test of Executive Function Score (TMT-exec) found that obese patients had an increased risk of about 4 times to decrease cognitive performance (odds ratio (OR): 3.77, 95% confidence interval (CI): 1.46-9.72).⁵

Gunstad and colleagues in the United States showed that in 408 subjects with overweight and obesity (body mass index >25 kg/m²) found poor performance in executive function tests compared with patients who had normal body mass index (18.5-24.9 kg/m²). In overweight and obesity there is a strong correlation with verbal interference subscale with negative correlation where $r = -0.23$ and switching of attention-letter / number ($r = 0.20$).⁶

2. MATERIAL AND METHODS

This study has been approved by the Research Ethics Committee at the Faculty of Medicine, Universitas of Sumatra Utara. This study is a comparative analytic study with a cross-sectional approach. Schizophrenia patients who came to the outpatient treatment of Mental Health Hospital Prof. Dr. M. Ildrem North Sumatera Province period July 2017-August 2017 that meets the inclusion criteria, selection with non probability sampling type of purposive sampling.

The sample size for each group was schizophrenic group with normal BMI (n_1) = 28 subjects and group schizophrenia with BMI above normal (n_2) = 28 subjects, total sample in this research is 56 subject. Inclusion criteria: Male schizophrenic patients diagnosed by PPDGJ III, has entered the phase of stabilization by using risperidone medication 4 mg/day, aged between 20-40 years, education minimum junior high, long sick 3-5 years. Exclusion Criteria: has general medical disorders and/or other comorbidities, History of substance use (except caffeine and nicotine).

Patients with schizophrenia who meet inclusion and exclusion criteria, firstly excluded having general medical disorder and/or other comorbidities, history of substance use (except caffeine and nicotine) by conducting autoanthesis interviews and confirmation of medical record and nurse information. It will then be given an explanation and asked to sign the agreement after obtaining a detailed and clear explanation from the researcher. Then the patients measured body mass index with instrument available in Prof. Ildrem Mental Health Hospital Medan. Each patient will be grouped into groups that have normal and obese BMI. Then in both groups assessed each MoCA-Ina score.

3. RESULT

This study was followed by 56 subjects who were male schizophrenic patients who came to the outpatient treatment in Prof. Ildrem Mental Health Hospital Medan consisting of 28 people with normal body mass index and 28 people with obese. The sample selection with non probability sampling of purposive sampling in July 2017-August 2017

3.1. DEMOGRAPHIC CHARACTERISTICS

In this study followed by 56 schizophrenic patients who used risperidon 4 mg per day, all subjects were not married.

Distribution Of Research Subjects Based On Sociodemographic Characteristic

No	Demographic characteristics	normal BMI (n= 28)	Obese (n= 28)	p
1	Age(years)	29.93±5.79	31.14±4.83	0.39 ^a
2	Education, n (%)			
	Junior High School	9(32.14%)	10(35.71%)	0.7 ^b
	Senior High School	19(67.86%)	18(64.29%)	
3	Employment (%)			
	- Work	10(35.71%)	11(39.29%)	0.7 ^b
	- Not Work	18(64.29%)	17(60.71%)	
4	Duration of Illness			
	Median (min-maks)	4(3-5)	4(3-5)	0.98 ^c
5	Age onset	25.86±5.57	27.07±4.40	0.37 ^a
6	Total PANSS Score	44.00±8.60	43.36±7.36	0.77 ^a

Based on demographic characteristics, in the group with normal BMI was 29.93 ± 5.79 years and in the obese group was 31.14 ± 4.83 years. Levels of education in the normal BMI Junior High School 9 (32.14%), Senior High School 19 (67.86%), obese Junior High School 10 (35.71%), Senior High School 18 (64.29%). Based on work status, normal body mass index, working 10 (35.71%), not working 18 (64.29%), obese working 11 (39.29%), not working 17 (60.71%). Based on the duration of illness, in both groups obtained a median of 4 years, a minimum value of 3 years and a maximum value of 5 years. The mean age of onset in the group with normal body mass index was 25.86 ± 5.57 years and in the obese group was 27.07 ± 4.40 years. The mean PANSS.

The results of this study indicate that the median value of MoCA-Ina score in subjects with a normal body mass index was 21 with a minimum value of 10 and a maximum value of 26. Obese group, the median value the MoCA-Ina score was 19, the minimum value is 11 and the maximum value is 25. The result of the analysis using Mann Whitney U test shows that there is a significant

difference of MoCA-Ina score based on body mass index of subject (p value $<0,05$).

4. DISCUSSION

Based on various literature states that cognitive function in schizophrenic patients is influenced by various factors: age, duration of illness, age of onset, sex, occupational status, marital status, education level, type of antipsychotics used. To control the potential for such confounders, the authors set inclusion and exclusion criteria. From these demographic characteristics did not show significant differences between the two groups in terms of age, education level, employment status, marital status, duration of illness, age of onset, total score of PANSS, drugs used.

In adults, factors such as increased levels of hormones and the maturation of structures and functions involved in the information process are the causes of differences between men and women. For example, the loss of gray matter during the brain maturation process in men or the protective role of the female hormone estrogen can affect the course of the disease. Related to cognitive function, men reported more difficulty in terms of verbal memory, emotional perception and flexibility. With the same level of treatment adherence, it was found that better outcomes were seen in women. With these considerations, the study was limited to the subject of schizophrenic males.⁷

In addition to the physiological changes associated with obesity such as: elevated lipid levels, metabolic syndrome, cardiovascular decline, there are other mechanisms that occur involving adipokines-level changes, secreted by adipose tissue associated with neurocognitive dysfunction and brain structural abnormalities. Although the exact mechanisms of the present are unclear, more and more studies show brain abnormalities in neuroimaging or pathology studies in obese individuals. In structural imaging of the brain, obese individuals exhibit global brain atrophy and decrease in the frontal and temporal brain regions. Abnormalities in white matter can also be found, including reduced volume, increased white matter intensity, and reduced functionality connectivity as measured by diffusion tensor imaging.⁸

Neurochemical evidence also shows the presence of white matter damage in obese individuals, with reduced n-acetylpartate

concentrations in white matter, parietal, and temporal, and reduced choline metabolism concentrations in frontal white matter. In short, overweight and obesity seem to be related to the cognitive domains associated with frontal / subcortical brain function (such as attention, working memory, fast cognitive processes, and executive functions) as well as memory. Behavioral manifestations of this diminished cognitive function may include increased impulsivity, poor self-monitoring, and behavioral barriers, as well as reduced planning and problem solving.⁸

Limitations in this study were not to see the time patients had overweight or obesity where it could lead to poor cognitive performance in patients. And in this study did not examine the factors associated with weight gain in schizophrenic patients associated with the emergence of pathophysiological changes that have a negative impact on cognitive performance such as: elevated lipid levels, metabolic syndrome, systemic inflammation and vascular changes.

5. CONCLUSION

From this study it can be concluded that there are significant differences in MoCA-Ina score in male schizophrenic patients with normal body mass index and above normal ($p <0.05$). The median score of MoCA-Ina score was found in the male schizophrenic group with normal body mass index was 21. And the median score of MoCA-Ina in the group with obese was 19. The minimum value of the MoCA-Ina score in the group with a normal body mass index is 10 and the maximum 26. The minimum value in subjects obese 11 and the maximum 25.

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