

Differences of Serum Vitamin D Level with Antipsychotic Treatment in Schizophrenic Male Patients Between Batak and Malay

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ABSTRACT- Background- Vitamin D levels with schizophrenia is lower than the control due to lifestyle and physical health factors such as smoking, inactivity, and social withdrawal, including decreases of sunlight exposure. Asia has the lowest average of vitamin D serum levels and Europe with lighter colored skin has higher serum levels of vitamin D. The Indonesian people were known as a nation that has a diversity of ethnic groups that exist in many areas. Each tribe has differences in living habits. Ethnic diversity, culture, religion, customs, geographical location, this is reflected in our daily lives that will affect the levels of vitamin D in patients with schizophrenic. To determine the differences of serum vitamin D levels with antipsychotic treatment in schizophrenic male patients between Batak and Malay.

Methods: This study was an analytical study to recruit 60 subjects of schizophrenic male patient (30 Batakese and 30 Malayan), aged between 15 to 55 years old, period at May to Nov 2016, the acute phase with no agitation, treatment with riperidone 4 mg. Blood sample for vitamin D serum was used ELFA method. Statistical analysis was used Mann Whitney U test.

Results: The vitamin D serum levels with antipsychotic treatment in schizophrenic, patient were lower in Batakese ethnic group than Malayan ethnic group, reaching statistically (22.9 ± 3.33 ng/ml) vs (27.9 ± 4.19 ng/ml) $p < 0.001$.

Conclusion: There are found significant differences of serum vitamin D levels with antipsychotic treatment in schizophrenic patient between Batak and Malay.

Key-words- Ethnicity, Schizophrenia, Serum vitamin D, Antipsychotic Treatment

INTRODUCTION

Schizophrenia is a chronic, severe, and disabling brain disorder, characterized by symptoms like hallucinations, delusions, confused thinking, and disorganized speech.^[1] In a systematic review of 188 studies from 46 countries, the median prevalence of schizophrenia ranged from 4 to 7 per 1000 persons, depending on the type of prevalence. Despite the low prevalence of schizophrenia, it is one of the greatest contributors to global burden of disease. These ecological findings might simply the role of vitamin D in the etiology of schizophrenia because cutaneous production of vitamin D from sun exposure is less efficient at high latitudes, during winter, and in dark-skinned persons.^[2]

The serum vitamin D level is determined by skin synthesis through sun exposure and/or dietary intake.^[3]

The sources of vitamin D are cutaneous production and diet, only some foods naturally contain it, and few are rich in vitamin D.^[4] Lifestyle and physical health factors associated with low vitamin D, such as smoking, increased body mass index, inactivity, and social withdrawal (likely resulting in decreased sunlight exposure), are all more frequent in people with psychosis.^[5]

There are several studies that have shown a correlation between psychosis and ethnicity, especially when dark skinned people immigrate to countries of higher latitude. These populations commonly have vitamin D insufficiency or even vitamin D deficiency. Ottesen *et al.*^[6] demonstrated in their cross-sectional study that vitamin D deficiency is more common in immigrants with psychosis compared to non-immigrants.

Although some studies have found no differences in serum vitamin D levels between individuals with light skin and those with dark skin, others have reported lower levels being more common in people with dark skin than in fair-skinned individuals. In a study on 503 volunteers (aged between 18 and 85 years) the association of ethnicity, skin color and sun exposure with serum vitamin D levels was evaluated. It was noted that among the

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ethnic groups, Asians had the lowest mean (15 ng/mL), ethnicity being one of the main determinants of the variations in serum vitamin D levels. The main predictors of vitamin D status were vitamin D intake (particularly from supplements) and skin pigmentation.^[7]

Study of the Correia *et al.* ^[8] in tropical regions such as Brazil, individuals from three different ethnic groups were evaluated with no significant differences being found between revealed lower serum 25 OHD levels in individuals of non-European ancestry.

MATERIALS AND METHODS

This study was an analytical study to recruit 60 subjects of schizophrenic male patient (30 Batak and 30 Malay), period in May to Nov 2016. The inclusion criteria were a diagnosis of schizophrenia, according to the PPDGJI III, aged between 15 to 55 years old, the acute phase treatment (PANSS total score > 80, P2, P3, P6 dan G9>4^[9]) with no agitation (PANSS EC, P4, P7, G4, G8 dan G14≤3^[10]), treatment with risperidone 4 mg, have ideal body weight (BMI=18.5–24.99). Exclusion criteria were co-morbidities of common medical illnesses, organic mental disorders or other psychiatric disorders, history of use of alcohol or other substances. Blood samples were taken for 3 ml serum vitamin D examination by private laboratory, blood sampling was taken in accordance with time and hours in the outpatient polyclinic (11–12) until the required number of subjects was fulfilled, then were examined in a private laboratory for serum vitamin D levels. Blood sample for vitamin D serum was used ELFA method. Statistical analysis was using Mann Whitney U test.

RESULTS AND DISCUSSION

Overall, 60 patients with schizophrenia (30 Batak and 30 Malay). The Most groups aged >30 years old in Batak were 20 subjects (66.7%). The Most of subjects with basic education level were 25 (83.3%) subjects in ethnicity Batak. The majority of subjects did not work were 23 subject (76.7%) and married subjects were 16 subjects (53.3%) (Table 1).

Table 1: Baseline Characteristic Demographic of Study Sample by Ethnicity

Characteristic Demographic	Ethnicity		P-values
	Batak (n = 30)	Malay (n = 30)	
Age (%)			
≤ 30 tahun	10 (33.3)	12 (40)	0.592
> 30 tahun	20 (66.7)	18 (60)	
Education (%)			
Basic	25 (83.3)	22 (73.3)	0.347
Middle	5 (16.7)	8 (26.7)	
Employment (%)			
Working	7 (23.3)	10 (33.3)	0.390
No working	23 (76.7)	20 (66.7)	

Marital Status (%)			
Married	16 (53.3)	15 (50)	0.796
No married	14 (46.7)	15 (50)	
PANSS total	88.96±6.5	89.78±4.6	0.538
BMI	22.47±4.3	22.78±5.2	0.174

Table 2: Differences of Serum Vitamin D Levels with Antipsychotic Treatment in Schizophrenic Male Patient between Batak and Malay

Vitamin D (ng/mL)	Mean ± SD	P-values
Batak	22.9±3.33	<0.001
Malay	27.9±4.19	–

Table 2 was shown, the mean vitamin D for the Batak group was 22.9 ng/mL and the standard deviation was 3.33 ng/mL. In the group of Malay vitamin D levels were higher than those of Batak with averaged 27.9 ng/mL and standard deviation of 4.19 ng/mL. From the results of the analysis using a Mann Whitney test showed, there was significant mean difference for vitamin D levels based on the Batak and Malay with *p* value <0.01. To measure vitamin D status, it is important only to measure 25(OH)D. Most experts agree that a 25(OH)D< 20 ng/ml (50 nmol/L) is vitamin D deficiency. Vitamin D insufficiency is defined as a 25(OH)D of 21–29 ng/ml and >30 ng/ml was considered to be vitamin D sufficiency.^[11]

This study, according to a study conducted by Graham *et al.*, in 2015 in New York examined serum vitamin D levels based on ethnicity between Caucasian and African patients with schizophrenic, where the serum vitamin D levels in Caucasians were significantly higher at 32.07±12.6 ng/ml compared with Africa that is 14.55±5.7 ng/ml with *p*-value <0.0001.^[12]

The results of this study are similar to the studies undertaken by Menkes *et al.* ^[6] in 2012 measuring vitamin D levels in psychiatric patients diagnosed with schizophrenia spectrum in 34 patients Maori ethnic and 15 patients non Maori, from ethnic Maori have a lower rate of vitamin D that is 34.0±14.3 nM, n= 34 compared to europe 41.6±14.1 nM, n = 15, but this difference failed statistically significant test (t= 1.71, *p*= 0.093, *df*= 47) by because of the small number of samples, but this indicates that Maori ethnicity with schizophrenia indicates a relationship with each other and both contribute to low vitamin D and based on ethnic differences identified from 51 Maori patients, 14 of whom show severe deficiency <25 nM compared to 5 of 51 patients in non Maori ethnicity, this shows a significant difference between the two ethnic groups with *p* = 0.022.^[13]

In his study Lally *et al.* ^[14] in London, examining vitamin D serum levels in psychotic patients, showing a significantly lower serum vitamin D levels in African/Caribbean (n=104)= 10.6±5.9 than white ethnic (n= 183)= 135±8.1 with *p* value= 0.002.

CONCLUSIONS

There were significant differences of serum vitamin D levels with antipsychotic treatment in schizophrenic patients between Batak and Malay. The mean serum vitamin D level of the subjects in the schizophrenic group of Batak was 22.9 ng/mL with a standard deviation of 3.33 ng/mL, whereas in the Malay ethnic group, the serum vitamin D level was 27.9 ng/mL with a standard deviation of 4.19 ng/mL, $p < 0.001$.

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