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POSITIVE AND NEGATIVE SYNDROME SCALE AND HIGH-DENSITY LIPOPROTEIN CHOLESTEROL LEVELS

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ABSTRACT
Schizophrenia is a chronic psychopathological disorder characterized by distortions in cognition, emotion, perception, and behavior. In addition, patients with schizophrenia have a higher risk of cardiometabolic problems, such as obesity, type 2 diabetes, hypertension, hyperglycemia, and dyslipidemia, compared to the general population. Objective to determine the correlation between the total score of the Positive and Negative Syndrome Scale (PANSS) and High-Density Lipopretein-Cholesterol (HDL-C) levels in men with chronic schizophrenia. The sampling method is non-probability sampling with consecutive sampling type with a total of 77 people. Samples that meet the inclusion criteria and are willing to participate in further research, will be interviewed with the Mini International Neuropsychiatric Interview (MINI) ICD-10 (A1) version where the diagnosis is made using diagnostic guidelines based on PPDGJ-III. If they meet the criteria, they are asked to fill out the PANSS questionnaire. This analysis uses the Pearson Correlation. The results with the correlation test between HDL-C level and total PANSS score were tested using the Pearson test. From the results above, it was obtained p-value<0.001 which indicates that there is a very significant correlation between PANSS score and HDL-C level. The Pearson correlation value of r=-0.68 suggests a negative correlation with strong correlation strength, this indicates that the lower the HDL-C level, the higher the total PANSS score. We found a negative correlation with a strong correlation, this suggests that the lower the HDL-C level, the higher the total PANSS score.

Keywords: HDL-C level; PANSS; schizophrenia

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INTRODUCTION

Schizophrenia is a collection of clinical symptoms characterized by psychopathological damage involving cognition, emotion, perception, and behavioral aspects and manifested in patients and affecting the course of the disease, which is usually severe and long-lasting and is generally characterized by fundamental and characteristic distortions of thought and perception and inappropriate or blunted affect (Margarita & Vlachos, 2022). Density Lipoprotein-Cholesterol (HDL-C) circulating in human plasma is very complex and its relationship to atherosclerotic cardiovascular disease (ASCVD) is complicated. Human HDL-C consists of several discrete subpopulations of particles that differ in size, shape, charge, and composition of both lipid and protein (von Eckardstein et al., 2023).

HDL-C may protect against coronary heart disease (CHD) mainly derived from epidemiological studies of healthy populations, particularly in the previous study, patients with overt coronary heart disease (CHD) often showed low HDL cholesterol. The relationship between HDL-C and cardiovascular risk is not linear, for example, no further improvement in prognosis is seen with HDL-C levels above 60 mg/dl (1.5 mmol/L) (Kim et al., 2023). Previous research has suggested that very high HDL-C concentrations may be associated with increased risk (Huang et al., 2024). A registered study of more than 1 million US veterans

found a U-shaped relationship between HDL-C and total mortality with 50 mg/dL (1.25 mmol/L) being associated with the lowest mortality (Mørland et al., 2023).

Recent studies have reported that the predictive value of HDL-C is modified by Low-Density Lipoprotein-Cholesterol (LDL-C) and triglycerides (TG), compared with low HDL-C (defined as <50 mg/dl in women and <40 mg/dl in men) in isolation, the risk increases when low HDL-C occurs with high LDL-C and/or TG. Cardiovascular (CV) risk increases by 30% for LDL-C ≥ 100 mg/dl and TG <100 mg/dl or LDL-C <100 mg/dl and TG ≥ 100 mg/dl. When both TG and LDL-C are ≥100 mg/dl, CV risk increases by 60% (Liu et al., 2022). Patients with schizophrenia suffer from increased morbidity and mortality compared to the general population and have a life expectancy that is approximately 20% shorter. Patients with schizophrenia also have an increased prevalence of cardiometabolic risk factors such as obesity, type 2 diabetes, hypertension, hyperglycemia, dyslipidemia and compared to the general population. High-density lipoprotein cholesterol (HDL-C) cardiometabolic risk factors are strongly and inversely associated with the risk of coronary heart disease (González-Rodríguez et al., 2023).

Several studies have attributed metabolic disturbances in schizophrenia to lifestyle choices such as smoking, poor diet, prolonged stress, use of antipsychotic medications, and genetic susceptibility. Metabolic disturbances associated with atypical antipsychotic medications include abnormalities in glucose metabolism such as insulin resistance, hyperglycemia, dyslipidemia, and weight gain (Kim et al., 2023). In a meta-analysis of second-generation antipsychotics, olanzapine increased cholesterol levels to levels higher than those induced by aripiprazole, risperidone, or ziprasidone. However, the causal mechanisms underlying metabolic side effects with antipsychotics are unknown. Despite the effects of antipsychotics on lipid abnormalities, patients with schizophrenia who are antipsychotic-naive or drug-free also have low HDL-C levels and are at high risk for metabolic syndrome (Wu et al., 2023).

Many factors influence HDL-C levels and there is a negative relationship between body mass index (BMI) and HDL-C. In addition, smoking decreases HDL-C. While exercise increases HDL-C. As various factors (e.g. diet, exercise, smoking, obesity, antipsychotics, and schizophrenia) influence HDL-C, it seems prudent to investigate HDL-C in schizophrenia about BMI (Franczyk et al., 2023). The metabolic effects of many antipsychotic drugs further clarify the relationship between lipid factors and schizophrenia. It is well known that antipsychotic treatment can cause weight gain and dyslipidemia. Weight gain, mainly due to increased appetite and food intake, may indirectly increase lipid levels, but it has also been shown that dyslipidemia can occur independently of weight gain in patients treated with antipsychotics. Increased HDL-C levels during one year of antipsychotic treatment were significantly associated with reductions in negative symptoms (i.e., the negative subscale of the positive and negative syndrome scale (PANSS)), an association that remained significant after controlling for potential confounders, including demographic variables, lifestyle factors and BMI (Makary et al., 2023). Therefore, the aim of this study was to determine the correlation between the total score of the Positive and Negative Syndrome Scale (PANSS) and the levels of High-Density Lipopretein-Cholesterol (HDL-C) in men with chronic schizophrenia.

METHOD

The study was a numerical correlation study with a cross-sectional approach that examines the relationship between the total score of the Positive and Negative Syndrome Scale (PANSS) and the levels of High-Density Lipoprotein-Cholesterol (HDL-C) in men with chronic schizophrenia of the Karo tribe. Seventy-seven men with schizophrenia were involved in this

study using consecutive sampling. Inclusion criteria are 1) patients who meet the PPDGJI-III criteria; 2) age 15-45 years; 3) suffering from schizophrenia for 5 years; 4) discontinued antipsychotic treatment for at least 2 weeks; 5) PANSS score 90-150; 6) normal Body Mass Index (BMI); 7) patients who are treated with risperidone 4 mg; 8) cooperative and willing to participate in the study. Exclusion criteria are: 1) having comorbidities of other medical diseases or mental disorders; 2) organic and other psychiatric disorders; and 3) patients who use other than smoking and caffeine. Subjects who met the inclusion-exclusion criteria were interviewed using the Mini International Neuropsychiatric Interview (MINI) version of ICD-10. If the subjects met the criteria, they were asked to fill out a written informed consent. After receiving a detailed and clear explanation to participate in the study, the research subjects were asked to fill in data regarding their identity and demographic characteristics. The research subjects were then examined for a total PANSS score. Then the research subjects had their blood samples taken. Before blood sampling is carried out, the patient fasts for 10-12 hours to check the HDL-C levels by providing tools and materials (including sterile gauze, alcohol gauze, betadine, 3cc syringe, tourniquet, roll plaster, and blood sample tube) first clean with alcohol cotton in the cubital fossa vein area, then a tourniquet is installed on the upper arm and a 45-degree puncture is performed with a 3 cc syringe while releasing the tourniquet and then allowing 3 cc of blood to flow. After that, clean the puncture wound using betadine and then cover the scar with a roll of plaster. Store the blood in a blood sample tube and then name each tube and check the HDL-C levels in the laboratory installation. Furthermore, the data was analyzed to obtain the correlation value (r). If the data variables are normally distributed or at least one of the data variables is normally distributed and the linearity requirements are met, then the data analysis will be carried out using the Pearson Correlation test.

RESULT

Table 1 shows that the median age is 31 (22-35), marital status is married as many as 18 people (23.4%) and not married as many as 59 people (76.6%). Educational status was obtained by junior school by as many as 34 people (44.2%), high school by as many as 38 people (49.4%), and university by as many as 5 people (6.5%). Occupation obtained working as many as 14 people (18.2%) and not working as many as 63 people (81.8%). The median duration of illness is 6.00 years with a minimum maximum (5-10).

Table 1.
Respondent characteristics (n=77)

Respondent characteristics	Median (min-max)	f (%)
Age (year)	31(22-35)	
Educational		
Junior school		34(44.2)
High school		38(49.4)
university		5(6.5)
Occupation		
Work		14(18.2)
Not working		63(81.8)
Marital status		
Married		18(23.4)
Unmarried		59(76.6)
Duration of illness	6.00(5-10)	
PANSS positive	32.00(23-41)	
PANSS negative	26.00(18-30)	
PANSS psycophatologis	38.00(31-52)	

Table 2 shows that the correlation test between HDL-C levels and total PANSS scores was carried out using the Pearson correlation test. From the results above, a very significant correlation was obtained ($p < 0.001$) between the total PANSS score and HDL-C levels, with a

Pearson correlation value of r = -0.68 indicating a negative correlation with a strong correlation strength, this indicates that the lower the HDL-C level, the higher the total PANSS score.

Table 2.

Correlation between PANSS total score and HDL-C levels in chronic schizophrenic males of the Karo tribe

	HDL-C levels
Total PANSS Score	r= -0,68 p <0,001 n= 77

DISCUSSION

Demographic characteristics with a median age of 31 (22-35), this is to the American Psychiatry Association the psychotic picture of schizophrenia usually appears between late adolescence and mid-30s, and onset before adolescence is rare. The peak age at onset for the first psychotic episode is in the early to mid-20s for men and in the late 20s for women (Gogtay et al., 2011). Schizophrenia is a severe and chronic mental disorder with heterogeneous symptoms, including changes in cognition (perception and thoughts), emotions, and behavior. Schizophrenia is one of the leading causes of disability worldwide because it is a major burden on health, social, and economic problems (Harvey et al., 2019). The results of this study indicate that "unusual thought content" on the general psychopathology scale assessment of the PANSS score is more severe in adolescent-onset schizophrenia. The severity of schizophrenia symptoms is influenced by many factors, one of which is the speed of treatment (Gracianita et al., 2020). Early management of schizophrenia is expected to improve the severity of symptoms and increase remission in the future (Xenaki et al., 2022).

The definition of "unusual thought content" is thoughts that are characterized by the presence of strange, fantastic or bizarre ideas, ranging from the unusual (atypical) to the distorted and illogical (Sinott et al., 2016). In this study, a very significant relationship was obtained between HDL-C levels and PANSS scores with a correlation value of -0.68, $p<0.001$, and n=77. These results are from previous studies which stated that there is a significant relationship between HDL-C levels and PANSS scores with a correlation value of 0.21, $p<0.001$, and n=90 (Bryll et al., 2020). Patients with schizophrenia have a markedly increased prevalence of metabolic abnormalities including dyslipidemia and several meta-analyses have shown hyperglyceridemia and high HDL-C cholesterol in chronic schizophrenia (Li et al., 2020). Recently, high HDL levels have also been reported in first-episode psychosis (FEP), including antipsychotic-naive patients and subjects with only prodromal symptoms, i.e., at high risk for developing psychosis (Sayed et al., 2023). These findings suggest that suboptimal HDL-C levels serve as an unfavorable lipid marker in early psychosis (Armstrong et al., 2021).

CONCLUSION

Demographic characteristics of the subjects of this study were obtained by the group of the high school education level of 38 people (49.4%), unemployed employment status of 63 people (81.8%), unmarried of 59 people (76.6%), with a mean value of maximum minimum of 73.00 (32-90). The median duration of illness was 6 years with a minimum maximum (5-10). The median (min-max) HDL-C level was found to be 73 (32-90). A very significant relationship was found between HDL-C levels and the total PANSS score with a correlation value of -0.68 and $p <0.001$.

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