International Journal of Science and Research (IJSR)
ISSN: 2319-7064
SJIF (2020): 7.803

Association of Serum Lipid Abnormalities with Personality Traits in Remittent Cases of Bipolar Affective Disorder

Dr Ram Sakal Hansdah[1]*, Dr Anukaran Purty[2], Dr Shahnawaz Zafar[3]

[1]First and Corresponding Author, Senior Resident, Department of Psychiatry, Paulo-Jhano Medical College and Hospital, Dumka, Jharkhand, India
Email: unthinkable135[at]gmail.com
Phone: 7004996029
[2]Associate Professor and Head of the Department, Department of Medicine, Paulo-Jhano Medical College and Hospital, Dumka, Jharkhand, India
Email: dr. a. purty[at]gmail.com
Phone: 969343898
[3]Assistant Professor and Head of the Department, Department of Psychiatry, Paulo-Jhano Medical College and Hospital, Dumka, Jharkhand, India
Email: drzafarrinpas[at]gmail.com
Phone: 8051223554

Abstract: ***Lipid abnormalities are well known etiological factors in cardiovascular disorders and other systemic disorders due to atherosclerotic effects. Lifestyle and behavioural factors positively contribute to the modification of lipid profile, which suggests that personality traits might have some association with lipid profile. The study found high Extroversion was associated with a low level of serum High-Density Lipoprotein (HDL). Low Agreeableness was associated with a higher level of Total Cholesterol (TC), Triglycerides (TG), Low-Density Lipoprotein (LDL) and Very Low-Density Lipoprotein (VLDL). Low Conscientiousness was associated with a high level of TC and LDL. Low Neuroticism was associated with a high level of LDL. The findings present an interesting insight into the possible substrate of human behaviour at biochemical levels.***

Keywords: Personality traits, lipid profile, remittent Bipolar Affective Disorder

1.Introduction

Bipolar affective disorder (BAD) is a multi-component illness involving episodes of severe mood disturbance, neuropsychological deficits, physiological changes and disturbances in functioning. It typically consists of both manic and depressive episodes separated by periods of normal mood. Manic episodes involve elevated or irritable mood, over-activity, rapid speech, inflated self-esteem, and a decreased need for sleep. Depressive episodes are not limited to low mood but involve loss of interest and enjoyment, and reduced energy leading to increased fatigability and diminished activity. Cholesterol, a core component of the central nervous system (CNS), is essential for cell membrane stability and the correct functioning of neurotransmission. It is said that the ratio of phospholipids and free cholesterol determines the fluidity of biological membranes. Brain membranes have a very high content of essential poly-unsaturated fatty acids, for which they depend on alimentation. A large number of studies have suggested a relationship between serum cholesterol levels and various psychiatric illnesses, including depression, suicide, bipolar disorder, mood disorders associated with physical violence, schizophrenic violent suicide attempters, and borderline personality disorders and traits.

Personality traits are understood as patterns of thought, feeling, and behaviour that are relatively enduring across an individual's life span. In psychology, a model of an individual's personality that divides into five traits. Below is a description of each trait.

- Extroversion (E) is the personality trait of seeking fulfillment from sources outside the self or in the community. High scorers tend to be very social while low scorers prefer to work on their projects alone. • Agreeableness (A) reflects many individuals adjust their behaviour to suit others. High scorers are typically polite and like people. Low scorers tend to 'tell it like it is '.
- Conscientiousness (C) is the personality trait of being honest and hardworking. High scorers tend to follow rules and prefer clean homes. Low scorers may be messy and cheat others.
- Neuroticism (N) is the personality trait of being emotional.
- Openness to Experience (O) is the personality trait of seeking new experience and intellectual pursuits. High scores may daydream a lot. Low scorers may be very down to earth.

Less work has been addressed whether cholesterol is related to enduring personality traits, such as trait susceptibility to Bipolar Affective Disorder, as opposed to the association with acute symptoms of psychological distress. The one exception is Suarez (1999), who found that trait depression, a component of Neuroticism, and anxiety were both associated with lower total cholesterol and lower triglycerides in a small sample of young women.

2.Material and Methods

This study was conducted in Phulo-Jhano Medical College and Hospital, Dumka, Jharkhand outpatient-department-based cross-sectional case-control study in 30 remittent cases of Bipolar Affective Disorder and 30 healthy controls between July 2021 to December 2021.

We included subjects aged between 18 to 60 years of both sexes of diagnosed BAD according to ICD-10. The remittent phase was defined as a Young Mania Rating Scale (YMRS) score </= 10 and Hamilton Rating Scale for Depression (HRDS or HAM-D) score less than 7 with a symptom-free period of at least six months. Subjects with minimum literacy of 8th standard were included to better conduct the questionnaires of The Big five Personality test for personality traits. Written consent was obtained for participation in the study after thoroughly explaining the aims and procedures of the study.

Exclusion criteria for the cases were: 1. Any condition affecting the ability to fill out the assessment, such as major neurocognitive disorders, 2. Any severe neurological disorders, including an intellectual disability, 3. Refusal of written consent, 4. A history of active substance abuse/dependence, except nicotine and caffeine; during last 6 months, 5. Epilepsy or seizure disorders, 6. Patients with other comorbid psychiatric or medical conditions.

Inclusion criteria for the healthy controls were obtained with a score less than or equal to 3 for the General Health questionnaire-12 (GHQ-12).

Tools for Assessment:

1. Analysis of laboratory findings of serum cholesterol: A sample of 5 ml of venous blood shall be collected in the morning after 12 hours of fasting. The blood sample will be analyzed on the same day within 2 hours of collection, during which the sample will be stored at room temperature. Total cholesterol (TC), high-density lipoproteins (HDL), low-density lipoproteins (LDL), very-low-density lipoproteins (VLDL), and triglycerides (TG) will be assessed by the enzymatic method.
2. Socio-demographic datasheet: The relevant socio-demographic information shall be collected in predesigned semi-structured socio-demographic Performa.
3. The Young Mania Rating Scale (YMRS): The YMRS is an 11-item instrument used to assess the severity of mania. YMRS features operationally defined anchor points and the normal expected score of ≥ 20. Rating is based on patient self-reporting, combined with clinician observation**.**
4. Hamilton Rating Scale for Depression (Hamilton, 1960): The HDRS (also known as HAM-D) is the most widely used clinician-administered depression assessment scale. The original version contains 17 items (HDRS17) about symptoms of depression experienced over the past week. The HDRS was originally developed for hospital inpatients, thus the emphasis on melancholic and physical symptoms of depression. A later 21-item version (HDRS21) included 4 items intended to subtype the depression. Score less than 7 on HDRS were taken for the study.
5. NEO-FFI (The Big Five Personality Test): This is the shorter version of NEO PI-3 developed by Costa and McCrae equally useful to assess the Personality. The test is assessing the balance of the five individual factors with 50 behavioural items that make up the personality of an individual. This test can be performed in paper format and online.
6. General Health Questionnaire (GHQ-12) **(**Goldberg et al., 1978): GHQ is the most common assessment of mental well-being. Developed as a screening tool to detect those likely to have or be at risk of developing psychiatric disorders, it is a measure of the common mental health problems/domains of depression, anxiety, somatic symptoms, and social withdrawal. Available in a variety of versions using 12, 28, 30, or 60 items, the 28-item version is used most widely. This is not only because of time considerations but also because the GHQ 12 has been used most widely in other working populations, allowing for more valid comparisons.

3.Results

Table 1: Comparison of Age and years of Education between Cases (remittent cases of Bipolar Affective Disorders) and Healthy Controls

Variables	BAD (n=30) Mean± SD	HC (n=30) Mean± SD	t (df=58)	p
Age in years	33.13±7.82	34.40±6.58	-0.679	0.202
Education in years	11.13±1.55	15.87±2.15	-9.801	0.113

BAD=Remittent cases of Bipolar Affective Disorder, HC= Healthy Controls, n= sample size, df= degree of freedom

Table 1 shows the comparison of age and education between remittent cases of Bipolar Affective Disorders and Healthy controls using independent samples t-test. The mean age of cases is 33.13±7.82 and that of controls is 34.40±6.58. The mean education of cases is 11.13±1.55 and that of controls is 15.87±2.15. It is found that there is no statistically significant difference between the two groups ($p<0.05$).

Table 2: Socio-demographic characteristics (categorical) between remittent cases of Bipolar Affective Disorder and Healthy Controls

	Variables	Patient (n=30) No. %	HC (n=30) No. %	χ^2	df	p
Sex	Male	22 (36.7%)	25 (41.7%)	0.884	1	0.532
	Female	8 (13.3%)	5 (8.3%)			
Religion	Hindu	23 (38.3%)	24 (40.0%)	0.164	2	1.000
	Muslim	4 (6.7%)	3 (5.0%)			
	Others	3 (5.0%)	3 (5.0%)			
Employment status	Employed	21 (35.0%)	28 (46.6%)	5.455	1	0.042*
	Unemployed	9 (15.0%)	2 (3.3%)			
Marital status	Married	21 (35.0%)	21 (35.0%)	1.059	2	1.000
	Unmarried	8 (13.3%)	9 (15.0%)			
	Others	1 (1.7%)	0 (0.0%)			
Family type	Nuclear	11 (18.3%)	4 (6.7%)	4.356	1	0.072
	Joint/Extended	19 (31.7%)	26 (43.3%)			
Habitat	Rural	7 (11.7%)	11 (18.3%)	1.270	1	0.260
	Urban	23 (38.3%)	19 (31.7%)			
Family history of psychiatric illness	Yes	6 (10.0%)	0 (0.0%)	6.667	1	0.024*
	No	24 (40.0%)	30 (50.0%)			

HC= Healthy Controls, $\chi 2$= chi-square value, n= sample size, df= degree of freedom

Table 2. Shows comparison of sex, religion, employment status, marital status, family type, habitat, and family history of psychiatric between remittent cases of Bipolar Affective Disorders and healthy controls using Chi-square test. The number of male patients was 22 (36.7%), females 8 (13.3%) and that of controls, males were 25 (41.7%) and females 5 (8.3%). Patients following religion Hindu were 23 (38.3%), Muslim 4 (6.7%), others 3 (5.0%) and that of controls, Hindu were 24 (40.0%), Muslim 3 (5.0%) and others 3 (5.0%).21 (35.0%) of the patients were employed, 9 (15.0%) were unemployed as compared to controls, 28 (46.6%) were employed, and 2 (3.3%) were unemployed. Married patients were 21 (35.0%), unmarried 8 (13.3%), and 1 (1.7%) was separated and that of controls, 21 (35.0%) were married and 9 (15.0%) were unmarried.11 (18.3%) patients lived in nuclear families, 19 (31.7%) joint or extended families, and that of controls, most lived in joint families 26 (43.3%) and 4 (6.7%) in nuclear families. Urban habitats were more in numbers 23 (38.3%) in patients' group, while 7 (11.7%) belonged to the rural area and that of controls, 19 (31.7%) belonged to urban, 11 (18.3%) to rural. A family history of psychiatric illnesses was present in 6 (10.0%) of the patients, 24 (40.0%) denied any family history of psychiatric illnesses, while there was no psychiatric history in the control group.

It was found that the majorities of the patients were males, Hindus, employed, married, belonged to urban habitats, lived in joint or extended families, and did not have any family history of psychiatric illness. There were statistically significant differences seen in employment status (p=0.042) and family history of psychiatric illness (p=0.024) between cases and controls. ($p \leq 0.05$).

Table 3: Pearson's Correlation of personality traits, and serum lipid profile in remittent cases of Bipolar Affective Disorder

Variables		TC	TG	HDL	LDL	VLDL
Extraversion	**r**	-0.107	-0.115	-0.536*	-0.154	-0.028
	p	0.704	0.683	0.040	0.584	0.921
Agreeableness	**r**	-0.637*	-0.566*	0.010	-0.658**	-0.647**
	p	0.011	0.028	0.971	0.008	0.009
Conscientiousness	**r**	-0.522*	-0.173	-0.184	-0.584*	-0.235
	p	0.046	0.536	0.512	0.022	0.400
Neuroticism	**r**	-0.477	-0.120	-0.296	-0.514*	-0.196
	p	0.072	0.671	0.284	0.050	0.484
Openness	**r**	-0.336	-0.217	-0.133	-0.511	-0.236
	p	0.220	0.437	0.636	0.052	0.397

**Correlation is significant at ≤0.01, * Correlation is significant at ≤0.05
TC= Serum Total Cholesterol, TG= Serum Triglycerides, HDL= Serum High-Density Lipoprotein, LDL= Serum Low-Density Lipoprotein, VLDL= Serum Very Low-Density Lipoprotein

Table 3: shows correlation of personality traits and serum lipid profile in remittent cases of Bipolar Affective Disorder. The findings suggest that there is statistically significant negative correlation (r=-0.536*, p=0.040) between Extraversion personality trait and serum HDL. Agreeableness personality trait has statistically significant negative correlation with serum TC (r =-0.637*, p= 0.011), serum TG (r=-0.566*, p=0.028) and strongly negative correlation with serum LDL (r=-0.658**, p= 0.008) and serum VLDL (r=-0.647**, p= 0.009). Conscientiousness personality trait has statistically significant negative correlation with serum TC (r=-0.522*, p= 0.046) and serum LDL (r=-0.584*, p= 0.022). Also, there is statistically significant negative correlation (r=-0.514*, p= 0.050) between Neuroticism personality trait and serum LDL.

4.Discussion

In our present study, we found the correlation of personality traits and serum lipid profile in remittent cases of Bipolar Affective Disorder. There was a significant association of serum lipid profile with personality traits. High Extroversion was associated with a low level of serum High-Density Lipoprotein (HDL). Low Agreeableness was associated with a higher level of Total Cholesterol (TC), Triglycerides (TG), Low-Density Lipoprotein (LDL) and Very Low-Density Lipoprotein (VLDL). Low Conscientiousness was associated with a high level of TC and LDL. The finding is not consistent with a previous study that found that higher neuroticism was associated with lower levels of HDL, while we found low Neuroticism was associated with a high level of LDL. Other previous studies also have conflicting results with the present study stating that low Extroversion and Openness were associated with a higher level of serum Triglycerides.

Overall, our study shows that serum lipid profile and personality traits have a significant negative correlation. It would be significant in the sense that the knowledge of lipid profile can be used as a kind of intervention in caring cases of Bipolar Affective disorder and other psychiatric illnesses.

5.Conclusion

The present study adds to the growing literature on a complex relationship between lipid fractions and the personality profile of remittent BAD patients. Understanding the association between lipid abnormalities and personality traits may help manage BAD.

Reference

[1] Lee MH, Kim HC, Ahn SV, et al. Prevalence of Dyslipidemia among Korean Adults: Korea National Health and Nutrition Survey 1998-2005. *Diabetes Metab J*.2012; 36 (1): 43-55. doi: 10.4093/dmj.2012.36.1.43

[2] Yang S, Hwang JS, Park HK, et al. Serum lipid concentrations, prevalence of dyslipidemia, and percentage eligible for pharmacological treatment of Korean children and adolescents; data from the Korea National Health and Nutrition Examination Survey IV (2007-2009). *PLoS One*.2012; 7 (12): e49253. doi: 10.1371/journal. pone.0049253

[3] Sutin AR, Terracciano A, Deiana B, et al. Cholesterol, triglycerides, and the Five-Factor Model of personality. *Biol Psychol*.2010; 84 (2): 186-191. doi: 10.1016/j. biopsycho.2010.01.012

[4] Roh SJ, Kim HN, Shim U, et al. Association between blood lipid levels and personality traits in young Korean women. *PLoS One*.2014; 9 (9): e108406. Published 2014 Sep 30. doi: 10.1371/journal. pone.0108406

[5] Suarez EC. Relations of trait depression and anxiety to low lipid and lipoprotein concentrations in healthy young adult women. *Psychosomatic Medicine.1*999; 61: 273–279.

[6] Terracciano A, Costa PT Jr. Smoking and the Five-Factor Model of personality. *Addiction*.2004; 99 (4): 472-481. doi: 10.1111/j.1360-0443.2004.00687. x

[7] Kaplan JR, Muldoon MF, Manuck SB, Mann JJ. Ann N Y Acad Sci. (1997). Assessing the observed relationship between low cholesterol and violence-related mortality. Implications for suicide risk. Ann N Y Acad Sci.836: 57-80.

[8] Markus CR. (2008). Dietary amino acids and brain serotonin function; implications for stress-related effective changes. Neuromolecular Med.10 (4): 247-58. DOI: 10.1007/s12017-008-8039-9.

[9] Patrick RP, Ames BN. (2015). Vitamin D and the omega-3 fatty acids control serotonin synthesis and action, part 2: relevance for ADHD, bipolar, schizophrenia, and impulsive behavior. FASEB J.14: 268342.

[10] Schwartz JA, Rowland MW, Beaver KM. (2014). A genetically informed test of cholesterol levels and self-control, depressive symptoms, antisocial behaviour, and neuroticism. J Affect Disord.164: 139-47. http://www.ncbi.nlm.nih.gov/pubmed/24856567

[11] Shrivastava S, Pucadyil TJ, Paila YD, Ganguly S, Chattopadhyay A. (2010). Chronic cholesterol depletion using statin impairs the function and dynamics of human serotonin (1A) receptors. Biochemistry.49 (26): 5426-35

[12] Troisi A, D'Argenio A. (2006). Apolipoprotein AI/apolipoprotein B ratio and aggression in violent and non violent young adult males. J Psychiatr Res.40 (5): 466-72.

[13] Wallner B, Machatschke IH. (2009). The evolution of violence in men: the function of central cholesterol and serotonin. Prog Neuropsychopharmacol Biol Psychiatry.33 (3): 391-7

[14] hang Y., Chang Z., Chen J., Ling Y., Liu X., Feng Z., Chen C., Xia M., Zhao X., Ying W., Qing X., Li G., Zhang C. (2015). Methylation of the tryptophan hydroxylase 2 gene is associated with mRNA expression in patients with major depression with suicide attempts. Mol Med Rep.