

# Deranged Serum Cholesterol Levels in First Episode Mania

Dear Editor,

Low cholesterol and triglyceride levels have been reported in patients with affective disorders, both in actively symptomatic and remitted states.<sup>[1,2]</sup> Though the phenomenon is not completely understood, this abnormality is well-established in the Western population.<sup>[1-3]</sup> However, the generalizability of these results to the developing world remains questionable as the two populations differ significantly with respect to their physiology, physical activity, socioeconomic status, lifestyle, and food habits.

As a part of an ongoing study, we recruited 50 consecutive male patients with first episode mania (International Classification of Diseases - 10, Diagnostic Criteria for Research (ICD-10 DCR), World Health Organization, 1993), who attended the outpatient department of a tertiary care psychiatric institute located in the eastern part of India. This institute caters to the needs of a large population from adjoining states of central, northern and north-eastern part of the country in addition to the local populace. All subjects were either “drug-free” (*n* = 21; drug free for at least 4 weeks in patients receiving oral psychotropic medications or 8 weeks in patients receiving depot medications, prior to recruitment) or “drug-naïve” (*n* = 29; patients who never received any psychotropic medication in the past). Neither of the patients suffered from any neurological, medical, or substance-related comorbidity, nor did they have any chronic illness that may have affected their blood lipid levels. The study was approved by the institute’s ethical committee, and all participants gave valid and informed consent for the study.

After a 12-hour fast, morning venous blood samples were drawn. Total cholesterol (TC), high-density lipoprotein (HDL) cholesterol, low-density lipoprotein (LDL) cholesterol, very-low-density lipoprotein (VLDL) cholesterol, and triglycerides were measured. Body mass index (BMI) was calculated as weight in kilograms divided by height in meters squared. The mean age of our study sample was 26.94 ± 6.94 years and mean value of BMI was 18.59 ± 2.35 kg/m<sup>2</sup>. Subjects had a mean TC level of 136.06 ± 35.47 mg/dL, Triglyceride of 87.28 ± 38.73 mg/dL, HDL of 38.50 ± 8.71 mg/dL, LDL of 82.14 ± 30.56 mg/dL, and VLDL of 17.04 ± 7.67 mg/dL [Table 1].

We compared our findings to available normal values of a population belonging to the same age (21-30 years) and sex group (male) described from western part of India.<sup>[4]</sup> The characteristics of control population and our subject group were similar, being free of major medical or substance related comorbidities (including absence of obesity i.e., BMI <30 kg/m<sup>2</sup>). Further, the controls did not suffer from any major psychiatric disorders and belonged to lower and middle income families, also similar to our subjects.<sup>[4]</sup> Finally, both studies used fasting serum samples to measure lipid profile.

Independent sample t-test yielded a significant (*P* < 0.001) difference in the TC, HDL, and LDL levels between the two groups, being lower in patients with mania [Table 1]. There was no statistically significant difference in the triglyceride and VLDL levels between the two groups, although they were lower in the manic group. Hence, present findings corroborate with available literature<sup>[1,2]</sup> and are, to the best of our knowledge, the first report from an Indian study. These findings are of importance because the population these patients represent differs considerably from the Western world (on which past results were primarily based).

Recent research in biological psychiatry suggest that serum cholesterol may be a surrogate marker for impulsivity,<sup>[5]</sup> and lower levels of TG and LDL have been demonstrated to predict significantly increased impulsivity in psychiatric

**Table 1: Comparison of mean lipid and cholesterol values between study sample and control population**

Variables	Groups		t-test for equality of means		
	Mania N = 50 Mean ± SD	Control N = 167 Mean ± SD	t	df	P
Total cholesterol (mg/dL)	136.06±35.47	164.00±30.30	4.998	215	0.0001***
Triglyceride (mg/dL)	87.28±38.73	92.6±30.60	0.883	215	0.377
HDL (mg/dL)	38.50±8.71	43.60±10.60	3.422	215	0.0007***
LDL (mg/dL)	82.14±30.56	100.40±27.00	3.772	215	0.0002***
VLDL (mg/dL)	17.04±7.67	18.80±7.00	1.442	215	0.150

\**P* < 0.05, \*\* *P* < 0.01, \*\*\**P* < 0.001. HDL = High-density lipoproteins, LDL= Low-density lipoproteins, SD= Standard deviation, VLDL= Very-low-density lipoprotein

patients.<sup>[6,7]</sup> Hence, bearing in mind that high scores on measures of impulsivity pose considerable risk for suicide and other self-harming behaviors,<sup>[8]</sup> the finding of reduced baseline cholesterol levels in patients with first episode mania is noteworthy. Patients presenting with low cholesterol and mood symptoms need increased clinical attention and surveillance. It may also warrant increased caution while implementing interventions aimed at lowering serum lipids, using statins and fibrates.

Our findings are, however, preliminary in this regard. The sample consisted only of male patients and lacked an internal control. Furthermore, it may be difficult to generalize the findings to other parts of India since significant variability prevails between the regions with respect to lifestyle, food habit, and so on. Future studies with a larger sample size, with inclusion of female patients and an internal control are suggested.

**Anjana Rao Kavoor, Daya Ram,  
Sayantanava Mitra**

*Department of Psychiatry,  
Central Institute of Psychiatry, Kanke, Ranchi, India  
E-mail: anjanarao31@gmail.com*

## References

1. Atmaca M, Kuloglu M, Tezcan E, Ustundag B, Bayik Y. Serum leptin and cholesterol levels in patients with bipolar disorder. *Neuropsychobiology* 2002;46:176-9.
2. Sagud M, Mihaljevic-Peles A, Pivac N, Jakovljevic M, Muck-Seler D. Platelet serotonin and serum lipids in psychotic mania. *J Affect Disord* 2007;97:247-51.
3. Fagiolini A, Frank E, Scott JA, Turkin S, Kupfer DJ. Metabolic syndrome in bipolar disorder: findings from the Bipolar Disorder Center for Pennsylvanians. *Bipolar Disord* 2005;7:424-30.
4. Durgawale P, Patil S, Shukla PS, Sontakke A, Kakade S, Yadav S. Evaluation of reference intervals of Serum Lipid Profile from Healthy Population in Western Maharashtra. *Indian J Clin Biochem* 2009;24:30-5.
5. Vevera J, Fisar Z, Kvasnicka T, Zdenek H, Starkova L, Ceska R, *et al*. Cholesterol-lowering therapy evokes time-limited changes in serotonergic transmission. *Psychiatry Res* 2005;133:197-203.
6. Conklin SM, Stanford MS. Premeditated aggression is associated with serum cholesterol in abstinent drug and alcohol dependent men. *Psychiatry Res* 2008;157:283-7.
7. Troisi A. Low cholesterol is a risk factor for attentional impulsivity in patients with mood symptoms. *Psychiatry Res* 2011;188:83-7.
8. Swann AC, Lijfijt M, Lane SD, Steinberg JL, Moeller FG. Increased trait-like impulsivity and course of illness in bipolar disorder. *Bipolar Disord* 2009;11:280-8.

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