

Lower LDL cholesterol level during COVID-19 hospitalization is associated with higher mortality: is this a paradox?

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INTRODUCTION BACKGROUND

Hyperlipidemia, other cardiovascular risk factors, and cardiovascular disease have been associated with worse outcomes in patients with COVID-19 [1]. However, decrease in low-density lipoprotein (LDL) cholesterol has been observed in patients with SARS-CoV-2 infection and has been associated with increased severity and mortality

OBJECTIVE/HYPOTHESIS

This study aimed to investigate and compare the associations between pre-COVID-19 and during COVID-19 LDL cholesterol level with in-hospital death in patients with COVID-19.

METHODS

Retrospective observational study
 Inpatient: 03/01/20- 10/31/21(NYCHHC)
 With laboratory-confirmed COVID-19 and available LDL cholesterol level either during the index admission or within 6 months prior.
 Propensity score-matching was employed to match the cohort of patients with pre-COVID-19 LDL with the one with available LDL during COVID-19 admission. Logistic regression analysis was performed

RESULTS

3020 patients were included in the analysis; median age 61 years, female 26.5%. 398 patients had available pre-COVID-19 LDL with a median LDL 75.8 mg/dL and 2622 patients had available LDL during COVID-19 admission with a median LDL 71 mg/dL (p=0.011). The matched cohorts included 796 patients; 398 patients in each subgroup.

TABLES

	Model 1 OR, 95% CI, p-value	Model 2 OR, 95% CI, p-value
Panel A: Overall cohort with LDL during COVID-19 (n=2622)		
LDL	0.98 (0.97 - 0.99), p<0.001	
LDL>70		0.40 (0.32 - 0.50), p<0.001
Panel B: Matched subgroup with LDL prior to COVID-19 (n=398)		
LDL	1.00 (0.99 - 1.01), p=0.833	
LDL>70		0.96 (0.54 - 1.71), p=0.897
Panel C: Matched subgroup with LDL during COVID-19 (n=398)		
LDL	0.98 (0.97 - 0.99), p=0.006	
LDL>70		0.22 (0.12 - 0.42), p<0.001

DISCUSSION

Our findings suggest that lower LDL level during COVID-19 is associated with higher likelihood for in-hospital death. Likely decrease in LDL is related to changes in metabolism induced by cytokines and inflammation causing impairment of lecithin-cholesterol acyltransferase similar to mechanism in sepsis [2]

CONCLUSIONS

LDL during COVID-19 is inversely associated with death. Our findings are likely explained by acute alterations in lipid metabolism due to inflammation. Therefore, while LDL seems to have prognostic value during acute SARS-CoV-2 infection

REFERENCES

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