中文題目：陰電性脂蛋白與慢性C型肝炎病毒感染的關聯性

英文題目：Association between electronegative low-density lipoprotein and chronic hepatitis C infection

作　　者：戴嘉言[1,2,3]，梁博程[1,2]，黃釧峰[1,2,3]，葉明倫[1,2,3]，林子堯[1,2,3]，黃志富[1,2,3]，莊萬龍[1,2,3]，余明隆[1,2,3]

服務單位：[1]高雄醫學大學附設醫院內科部，[2]高雄醫學大學附設醫院肝膽胰內科，[3]高雄醫學大學醫學系

Background*:* Patients with chronic hepatitis C virus (HCV) infection display significantly decreased triglyceride, total cholesterol, high-density lipoprotein-cholesterol (LDL-C) and low-density lipoprotein-cholesterol (LDL-C) levels in plasma. However, chronic HCV infections have shown to have significantly higher mortality such as increased incidence of cancer and cancer-related mortality and extrahepatic diseases such as cardiovascular diseases and cerebral vascular diseases (CVD) than the general population. Plasma LDL has been classified into five charge-defined sub-fractions LDL L1, L2, L3, L4 and L5 by anion-exchange chromatography and L5, the most negatively charged LDL, is more abundant in patients with increased cardiac risks than in the healthy population. We aimed to investigate the relationship between the HCV infection and serum LDL L5 level and the impact of antiviral therapy on the serum LDL L5 level.

Method: Patients with CHC and controls were enrolled in the present study. Laboratory data were collected and plasma was tested for the LDL 5 sub-fractions (L1, L2, L3, L4, and L5) using the increasing negative charge on anion-exchange columns. L5% means the percent of L5 in total LDL. L5 concentration ([L5]) estimated by L5%* LDL-C. Patients treated with direct antiviral agents (DAAs) were enrolled for testing the serial change of the L5 at baseline, end-of-treatment (EOT), and end-of-follow-up (EOF) which is the 12 weeks after cessation of therapy with the definition of the sustained virological response (SVR12).

Result: Total 477 subjects were enrolled in the study. There were 167 (35.0%) with negative anti-HCV and 310 (65.0%) with positive anti-HCV and 73 subjects with the baseline, EOT, and EOF samples after DAA treatment for testing the L5% and [L5]. The L5% was an independent risk factor associated with HCV infection (the risk of L5% >1.8 was approximately ten-fold OR=10.28) and the risk of L5% >5 (OR=8.1) was approximately eight-fold after adjusting the other risk factors. By multivariate analyses, the anti-HCV positivity was the only factor significantly associated with the risk of L5%>1.8. Among patients with HCV infection, L5% was significantly associated with ALT and platelet levels. For patients with DAA therapy, plasma L5 (%) and [L5] significantly decreased by successful anti-viral treatment ($p<0.0001$ for L5% and $p=0.0018$ for [L5]).

Conclusion: LDL L5, showing an increased level compared to controls, indicates that it can be used as a new biomarker for liver-related disease caused by HCV infection. Although the elevated serum lipid profile has been noted after successful DAA therapy, the decreased levels of L5 after the cure of the HCV RNA implicate a role in the decreased risk of CVD.