

Augmentation in LDL-cholesterol with aging leads to oxidative stress and disturb sphingolipid metabolism

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We investigated that increase in circulating levels of low-density lipoprotein cholesterol (LDL-cholesterol) by aging may cause alterations in plasma metabolites. Among 596 healthy, nondiabetic subjects (aged 30-65 years), 390 individuals had normal levels of LDL-cholesterol at baseline, 53 subjects were in high levels of fasting LDL-cholesterol after 3 years. The 337 individuals, who retained normal LDL-cholesterol levels after 3-year follow-up, were matched for age, gender, BMI, and fasting LDL-cholesterol, and the matched group was included as the control group (n = 75). At the 3-year follow-up, total-cholesterol, LDL-cholesterol, oxidized LDL (ox-LDL), lipoprotein-associated phospholipase A2 (Lp-PLA2) activity, and urinary 8-epi-prostaglandin F2a were increased in the high-LDL group than those of the control group. The high-LDL group also showed significant decreases of sphingomyelin (SM) (d18:0/16:1) and phosphatidylcholine (PC) (18:0/20:4), associated with an increases of LDL-cholesterol, and significant increases of palmitic amide and lactosylceramide. Mean changes of SM (d18:0/16:1), C17 sphinganine, PC (18:0/20:4), and lysoPCs (C16:1, C16:0, C17:0, C18:1, C18:0, C20:4, C20:3, and C22:6) were statistically different between the control and the high-LDL groups. Overall, the changes of ox-LDL positively correlated with changes of LDL-cholesterol, Lp-PLA2 activity, palmitic amide, oleamide, lysoPCs, and C17 sphinganine, and negatively correlated with changes of SM (d18:0/16:1). Increase in LDL-cholesterol induced by aging is associated with increased oxidative stress and disturbed sphingolipid metabolism.

Biography

Miso Kang is a PhD student working at Yonsei University Clinical Nutrigenetics/Nutrigenomics Laboratory with Jong Ho Lee. She consulted on a variety of projects, involving qualitative and quantitative analysis to achieve acquisitions, restructurings, and starategic realignments with her team. She has published 1 paper in reputed journal.

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