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Energy intake at different times of the day: Its association with elevated total and LDL cholesterol levels

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Handling Editor: Dr. A. Siani

 PlumX Metrics

DOI: <https://doi.org/10.1016/j.numecd.2019.01.003>

 Article Info

Abstract

Highlights

- Distribution of energy intake (EI) during a day was associated with cholesterol levels.
- Every 100 kcal additional EI at night was associated 1.08 mg/dl higher of LDL-cholesterol.
- Replacing the EI at night by EI during the day was associated with lower total cholesterol.
- Replacing the EI at night by EI during the day was associated with lower LDL-cholesterol.

Abstract

Background and aims

This study aimed to examine the association between macronutrient intake at different times of the day and blood lipid levels.

Methods and results

The study was based on the Nutrition and Health Survey in Taiwan, a cross-sectional study of non-institutionalized and non-pregnant healthy adults (≥ 19 -years-old). A one-day (24 h) dietary recall assessed participants' food intake. Fasting plasma triglycerides, total cholesterol, and high-density lipoprotein (HDL) cholesterol were determined. Low-density lipoprotein (LDL) cholesterol was estimated based on the Friedewald formula. According to the data of eligible subjects ($n = 1283$), the time of energy intake was categorized into three meal times 0500-0929 (morning), 1130-1329 (noon), and 1730-2029 (evening), along with three snack times 0930-1129 (mid-morning), 1330-1729 (afternoon), and 2030-0459 (night). Energy and macronutrient intake were calculated for 6 time periods, based on 24 h recall data. An adjusted regression model showed that by transferring 100 kcal intake at night to the morning or noon, LDL cholesterol would be lower by 1.46 (95% CI: 2.42-0.50) and 1.27 mg/dL (95% CI: 2.24-0.30), respectively. Transferring 100 kcal of fat intake at night to earlier periods was associated with a lower LDL cholesterol level, especially transferring to noontime (significantly lower by 5.21 mg/dL, 95% CI: [7.42-2.99]) and evening (significantly lower by 3.19 mg/dL, 95% CI: [6.29-0.08]).

Conclusions

Total cholesterol and LDL cholesterol had the same pattern of association with the timing of energy intake. The study showed that elevated total and LDL cholesterol were positively associated with nighttime energy and fat intake.

Keywords:

[Meal timing](#), [Cholesterol](#), [Epidemiology](#), [Nutrition surveys](#)

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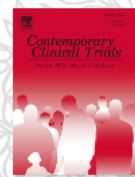
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