

שם: מירית טיין

שם העבודה:

The association of processed meat consumption with serum levels of oxidative stress and pro-inflammatory metabolites and Non-Alcoholic Fatty Liver Disease (NAFLD)

מנחים: פרופ' שירה זלבר-שגיא, פרופ' רויטל קריב, פרופ' אורן תירוש

Abstract

Background:

Non-Alcoholic Fatty Liver Disease (NAFLD) is the most prevalent chronic liver disease that occurs across all age groups, representing a serious and growing clinical problem due to the growing prevalence of obesity and overconsumption of processed foods. Several studies assessed the role of insulin resistance, oxidative stress, and lipid peroxidation in the development and progression of NAFLD. Studies showed that high meat consumption, specifically red and processed meat, are independently associated with NAFLD, insulin resistance, metabolic syndrome, and oxidative stress. The development of these conditions might vary, depending on the level of meat processing and inappropriate cooking methods due to oxidative processes. These oxidative processes affect overall quality of meat by nutrients deterioration and formation of toxic compounds, such as Malondialdehyde (MDA), Trimethylamine N-oxide (TMAO), advanced glycation end products (AGEs) and Nitrites. However, there is lack of knowledge on the association of these compounds with NAFLD and insulin resistance.

Aim:

To evaluate the association of processed meat consumption with chronic and post-prandial serum levels of oxidative stress and pro-inflammatory metabolites and NAFLD among adults.

Methods:

(1) A Cross-sectional study will be conducted on men and women who undergo metabolic screening study at the Tel-Aviv Medical Center. The independent variable, dietary intake, will be measured by using Food frequency questionnaire (FFQ), with specific detail on food processing level. Dependent variables, serum oxidized metabolites, fasting blood samples, liver fibrosis, NAFLD diagnosis and the amount of steatosis will be characterized by analysis of LC-MS (mass spectrometry HPLC), ELISA, blood count, and ultrasonography, respectively. The association between meat processing level and NAFLD will be analyzed using multiple logistic regression models adjusted for potential confounding factors. (2) Randomized cross-over feeding trials on men and women with and without NAFLD. There will be five treatment groups with different test-meals consisting on different types

of meat at different processing levels. The dependent variables; serum oxidized metabolites and fasting blood samples will be measured at several time points post-prandial.

Importance of the study:

This study will be the first to prospectively test potential associations between different kinds of meat processing methods and NAFLD. The design as a randomized clinical trial will enable to evaluate the temporality of associations. This study may help in supporting practical nutritional recommendations for the prevention and treatment of highly prevalent chronic liver disease, which is a significant public health burden.