Effects of Red Meat Consumption With Proton Pump Inhibitors on Cardiovascular Disease Risk Factors in Rats

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Objectives: Cardiovascular disease (CVD) is the leading cause of death in the United States. Many studies showed that high consumption of red meat contributes to the risk of CVDs due to its negative effects on cholesterol and blood pressure. In addition, long-term use of proton pump inhibitors (PPIs) has been reported to have an adverse impact on vascular functions. The purpose of this study was to examine the effects of red meat consumption with PPIs on cardiometabolic risk factors in rats.

Methods: Twenty eight 9-month-old Sprague Dawley male rats were divided into four groups in a 2 diets (white meat powder or red meat powder) × 2 treatments (with or without PPI) factorial design. The diets consisted of 70% rat chow and 30% meat powder while PPI treatment was included in 0.05 g/kg diet. After 8 weeks of feeding, tissues were harvested and blood was collected for analysis of glucose, lipid profiles, total antioxidant capacity, and liver function enzymes.

Results: There were no significant differences in initial weight and final body weight among groups. However, rats fed with red meat powder exhibited lower weight gain ($P = 0.049$) and lower epididymal fat ($P = 0.046$). PPI administration increased aspartate aminotransferase (AST, $P = 0.003$), creatine kinase (CK, $P = 0.049$), and resulted in an increasing trend in alkaline phosphatase (AP, $P = 0.063$) but no significant differences were found between red meat vs. white meat. There were no significant differences in glucose, HbA1C, lipid profiles, total antioxidant capacity, alanine aminotransferase (ALT), lactate dehydrogenase (LDH), and gamma glutamyl transferase (rGT) between meat types or PPI treatments.

Conclusions: The results suggest that red meat consumption might have some positive effects on body composition by lowering weight gain and epididymal fat compared to white meat consumption while not significantly impacting other cardiometabolic risk factors. Nevertheless, increasing trends in some liver function enzymes indicate that the use of PPIs may cause some hepatic damage. Further research is needed to determine the underlying mechanisms of the current findings.

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