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Abstract

Relationships between Meat and Fish Consumption, N-Acetyltransferase 2 Genotypes, and Colorectal Cancer Risk: A Case–Control Study in the Basque Country †

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Background and objective: High consumption of haem iron-rich foods has been associated with colorectal cancer (CRC) risk. However, genetic susceptibility's role remains unclear. Therefore, we studied possible interactions between variants in the N-Acetyltransferase 2 (*NAT2*) gene, involved in carcinogenic metabolism, and meat and fish consumption with CRC risk. Methods: This observational study includes 229 patients diagnosed with CRC and 229 age- and sex-matched controls from a population-based bowel cancer screening program. Intake of fish and red, white, processed, and grilled meat, as well as three slow *NAT2* acetylator variants (rs1801280, rs1799930, and rs1799931), was analyzed. Logistic conditional regression was used to calculate odds ratios (ORs) and 95% confidence intervals (95% CI) for CRC risk. Results: The CT genotype of rs1801280 and AA genotype of rs1799930 may increase CRC risk (adjusted model: OR = 2.91, 95% CI 1.50–5.64, $p = 0.002$; OR = 0.24, 95% CI 0.08–0.74, $p = 0.013$). Moreover, the consumption of processed meat and of red meat were both associated with the risk of CRC (adjusted model, processed meat tertile 2 vs. 1, OR = 3.20, 95% CI 1.37–7.49, $p = 0.007$; red and processed meat, tertile 3 vs. 1, OR = 2.09, 95% CI 1.04–4.21, $p = 0.039$). A significant interaction was observed between white meat intake and the CC + CT genotype of rs1801280 (tertile 3 vs. 1, OR = 4.71, 95% CI 1.56–14.24, p interaction = 0.001). Discussion: Confirming other authors' works [1,2], our data suggest that the "slow" variants *NAT2* 341T>C and 590G>A and the intake of red and processed meat were related to CRC risk. Additionally, the variant *NAT2* 341T>C may modify the association of white meat intake with CRC risk.

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Institutional Review Board Statement: This study was conducted according to the guidelines laid down in the Declaration of Helsinki, and all procedures involving patients were approved by the Clinical Research Ethics Committee of the Basque Country (protocol code PI2011006, data of approval 23 March 2012; and PI2014042, data of approval 28 May 2014).

Informed Consent Statement: Written informed consent was obtained from all the study participants.

Data Availability Statement: Data are to be made available only via a request to the corresponding author. Data will be provided only after the acceptance and signature of a formal data-sharing agreement.

Conflicts of Interest: The authors declare no conflict of interest.

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