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A Case-Control Study on Dietary Heme/Nonheme Iron and Colorectal Cancer Risk

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Abstract : Background and purpose: Although our country is a developing one, it has a typical Western meat-rich dietary style. Based on estimates of heme and nonheme iron contents in representative foods, we carried out the present epidemiologic study, with the aim of accurately analyzing dietary iron and its role on CRC risk. Subjects/methods: Patients (611 CRC incident cases and 2394 controls, all belonging to public hospitals of our capital city) were interviewed through a questionnaire including socio-demographic, reproductive and lifestyle variables, and a food frequency questionnaire of 64 items, which asked about food intake 5 years before the interview. The sample included 1937 men and 1068 women. Controls were matched by sex and age (± 5 years) to cases. Food-derived nutrients were calculated from available databases. Total dietary iron was calculated and classified by heme or nonheme source, following data of specific Dutch and Canadian studies, and additionally adjusted by energy. Odds Ratios (OR) and 95% confidence intervals were calculated through unconditional logistic regression, adjusting for relevant potential confounders (education, body mass index, family history of cancer, energy, infusions, and others). A heme/nonheme (H/NH) ratio was created and the interest variables were categorized into tertiles, for analysis purposes. Results: The following risk estimations correspond to the highest tertiles. Total iron intake showed no association with CRC risk neither among men (OR=0.83, ptrend =.18) nor among women (OR=1.48, ptrend =.09). Heme iron was positively associated among men (OR=1.88, ptrend < .001) and for the overall sample (OR=1.44, ptrend =.002), however, it was not associated among women (OR=0.91, ptrend =.83). Nonheme iron showed an inverse association among men (OR=0.53, ptrend < .001) and the overall sample (OR=0.78, ptrend =.04), but was not associated among women (OR=1.46, ptrend =.14). Regarding H/NH ratio, risks increased only among men (OR=2.12, ptrend < .001) but lacked of association among women (OR=0.81, ptrend =.29). Conclusions. We have observed different types of associations between CRC risk and high dietary heme, nonheme and H/NH iron ratio. Therefore, the source of the available iron might be of importance as a link to colorectal carcinogenesis, perhaps pointing to reconsider the animal/plant proportions of this vital mineral within diet. Nevertheless, the different associations observed for each sex, demand further studies in order to clarify these points.

Keywords : chelation, colorectal cancer, heme, iron, nonheme
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