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Healthy Lifestyle Factors Associated With Lower Risk of Colorectal Cancer Irrespective of Genetic Risk

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Abstract

Abstract

Background & Aims

The combined effects of healthy lifestyle factors on colorectal cancer (CRC) risk are unclear. We aimed to develop a healthy lifestyle score, to investigate the joint effects of modifiable lifestyle factors on reduction of CRC risk and determine whether associations differ with genetic risk.

Methods

We collected data from a large population-based case-control study in Germany and used multiple logistic regression analyses to examine associations between the healthy lifestyle score (derived from 5 modifiable lifestyle factors: smoking, alcohol consumption, diet, physical activity, and body fatness) and CRC risk. We created a genetic risk score, based on 53 risk variants, to investigate the association of the healthy lifestyle score and risk of CRC, stratified by genetic risk.

Results

We included 4092 patients with CRC and 3032 individuals without CRC (controls) in our analysis. In adjusted models, compared to participants with 0 or 1 healthy lifestyle factor, participants with 2 (OR, 0.85; 95% CI, 0.67–1.06), 3 (OR, 0.62; 95% CI, 0.50–0.77), 4 (OR, 0.53; 95% CI, 0.42–0.66), or 5 (OR, 0.33; 95% CI, 0.26–0.43) healthy lifestyle factors had increasingly lower risks of CRC (P trend <.0001). We found no differences among subgroups stratified by genetic risk score, history of colonoscopy, or family history of CRC. Overall, 45% of CRC cases (95% CI, 34%–53%) could be attributed to non-adherence to all 5 healthy lifestyle behaviors.

Conclusions

In a large population-based case-control study, we identified a combination of lifestyle factors that appears to reduce risk of CRC, regardless of the patient's genetic profile. These results reinforce the importance of primary prevention of CRC.

Key words:

[DACHS](#), [colon cancer](#), [chemoprevention](#), [food](#)

Abbreviations:

[BMI](#) (body mass index), [CI](#) (confidence interval), [CRC](#) (colorectal cancer), [DACHS](#) (Darmkrebs: Chancen der Verhütung durch Screening), [EPIC](#) (European Prospective Investigation into Cancer and Nutrition), [FFQ](#) (food frequency questionnaire), [ICD-10](#) (International Classification of Diseases, 10th Revision), [MET](#) (metabolic equivalent of task), [NSAIDs](#) (nonsteroidal anti-inflammatory drugs), [OR](#) (odds ratio), [PAF](#) (population attributable fraction), [SNPs](#) (single nucleotide polymorphisms), [WCRF/AICR](#) (World Cancer Research Fund/American Institute for Cancer Research)

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Conflict of interest: The authors declare that they have no conflict of interest.

Registration: This observational study has been registered in the German Clinical Trials Register (ID DRKS00011793), which is a primary registry in the WHO Registry Network.

Author contributions: Study concept and design: HB, JCC and MH. Acquisition of data: HB, JCC, MH, LJ, VW, and KW. Analysis and interpretation of data: PRC and MH. Drafting of the manuscript: PRC. Critical revision of the manuscript for important intellectual content: MH, HB, JCC, LJ, VW, KW and VE. Obtained funding: HB, JCC and MH. Administrative, technical, or material support: HB, JCC and MH. Study supervision: HB, MH and JCC. All authors read and approved the final manuscript.

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