proceedings

Abstract

Prognostic Role of Polyunsaturated Fatty Acids in the Adipose Tissue of Colorectal Cancer Patients †

Cécile Roux-Levy [1,2], Christine Binquet [1,3,4], Carole Vaysse [5] and Vanessa Cottet [1,2,3,4,*] on behalf of the AGARIC study group

[1] Inserm UMR 1231, Université de Bourgogne, LabEx LipSTIC ANR-11-LABX-0021, 21000 Dijon, France; cecile.roux-levy@u-bourgogne.fr (C.R.-L.)
[2] NACRe Équipe 15, INRAE, 75338 Paris CEDEX 07, France
[3] Inserm CIC 1432, Clinical epidemiology team, Faculté de médecine de Dijon, 21000 Dijon, France
[4] University Hospital of Dijon, 21079 Dijon, France
[5] French Institut for Fats, Oils and Related Products (ITERG), 33610 Bordeaux, France
* Correspondence: vanessa.cottet@u-bourgogne.fr
† Presented at the 14th European Nutrition Conference FENS 2023, Belgrade, Serbia, 14–17 November 2023.

Abstract: Background and objectives: Nutritional intake and dysregulation of fatty acid metabolism play a role in the progression of various tumours. The consumption of different fatty acids is difficult to assess accurately by dietary questionnaires. Biomarkers allow objective assessments of intake, storage, and bioavailability. We studied the association between the polyunsaturated fatty acid (PUFA) composition of abdominal subcutaneous adipose tissue (a good indicator of dietary intake over 2–3 years) and all-cause mortality. Methods: In this multicentre AGARIC study, including 203 patients with colorectal cancer (CRC) undergoing curative surgery, samples were harvested from subcutaneous adipose tissue, which were analysed for PUFA composition. Cox proportional hazards models were used to estimate associations between PUFA levels and mortality. Results: After a median follow-up of 45 months, 76 patients died. These patients were more often men (72.4% vs. 57.5%, $p = 0.04$), diabetic (32.9% vs. 13.4%, $p = 0.001$), older (median: 74.5 vs. 66.6 years, $p = <0.001$), and with high alcohol consumption (47.4% vs. 30.7%, $p = 0.005$) compared to survivors. An increased risk of death was observed with higher levels of eicosadienoic acid (hazard ratio tertile3 vs tertile1 (HRT3vsT1) = 2.12; 95% confidence interval (CI) = 1.01–4.42; p-trend = 0.04), adrenic acid (HRT3vsT1 = 3.52; 95% CI = 1.51–8.17; p-trend = 0.005), and 22:5 n-6 (HRT3vsT1 = 3.50; 95% CI = 1.56–7.87; p-trend = 0.002). Conversely, the risk of death seemed to be lower when higher concentrations of γ-linolenic acid (HRT3vsT1 = 0.52; 95% CI = 0.27–0.99; p-trend = 0.04) and the essential fatty acid α-linolenic acid (HRT3vsT1 = 0.47; 95% CI = 0.24–0.93; p-trend = 0.03) were observed. The estimated δ-6-desaturase & elongase 5 enzyme activity were found to be positively associated with all-cause mortality (HRT3vsT1 = 2.25; 95% CI = 1.03–4.90; p-trend = 0.04). Discussion: The risk of death in CRC patients was increased in those with higher concentrations of certain n-6 PUFAs and lower concentrations of α-linolenic acid in their subcutaneous adipose tissue. These results reflect both dietary habits and altered fatty acid metabolism. Nevertheless, our exploratory results need to be confirmed in larger studies with further exploration of the mechanisms involved. The AGARIC study group: Scherrer Marie-Lorraine (Regional Hospital Centre Metz Thionville), Ayav Ahmet (University hospital of Nancy), Ortega-Deballon Pablo, (University hospital of Dijon), Lakkis Zaher (University hospital of Besançon), Liu David (University hospital Hautepierre of Strasbourg), and Deguelte Sophie (University hospital of Reims).

Keywords: colorectal cancer; polyunsaturated fatty acids; adipose tissue; mortality; prognosis

Citation: Roux-Levy, C.; Binquet, C.; Vaysse, C.; Cottet, V., on behalf of the AGARIC study group. Prognostic Role of Polyunsaturated Fatty Acids in the Adipose Tissue of Colorectal Cancer Patients. *Proceedings* **2023**, *91*, 103. https://doi.org/10.3390/proceedings2023091103

Academic Editors: Sladjana Sobajic and Philip Calder

Published: 5 December 2023

Author Contributions: V.C. and C.B.: AGARIC project concept and design; C.V. and the AGARIC study group: acquisition of data; V.C., C.B. and C.R.-L.: statistical analyses; V.C., C.B. and C.R.-L.: interpretation of data; V.C., C.B. and C.R.-L.: drafting of the manuscript; and all authors: critical revision of the manuscript and reading and approval of the final manuscript. All authors have read and agreed to the published version of the manuscript.

Funding: This work was supported by a French Government grant managed by the French National Research Agency under the program "Investissements d'Avenir", reference ANR-11-LABX-0021. The study obtained financial grants from the National Cancer Institute, the Ligue Contre le Cancer de Bourgogne-Franche-Comté, the "Fondation de France", the Regional Council of Burgundy, the European Regional Development Fund, and the Dijon University Hospital. Grants were also obtained from the "Réseau NACRe" (Réseau Nutrition Activité physique Cancer Recherche) and the "Cancéropôle Est" to participate in the congress.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: All patients provided signed informed consent. The study was carried out in accordance with the principles of the declaration of Helsinki and was approved by the local ethics committee (CPP EST 1, Dijon, France) and the French National Data Protection Authorities. The AGARIC study was registered on clinicaltrials.gov as NCT01966081.

Data Availability Statement: Data will be sent upon request from the corresponding author.

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