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ABSTRACT E-BOOK

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Dietary acrylamide and risk of specific subtypes of cancer: a dose response meta-analysis of epidemiological studies

Tommaso Filippini[1], Thorhallur I. Halldorsson[2], Carolina Capitão[3], Raquel Martins[3], Marco Vincenti[4], Osvaldo Santos[5], Ana Virgolino[3], Federica Laguzzi[6]
[1]Environmental, Genetic and Nutritional Epidemiology Research Center (CREAGEN), Department of Biomedical, Metabolic and Neural Sciences, University of Modena and Reggio Emilia, Modena, Italy
[2]Centre for Fetal Programming, Department of Epidemiology Research, Copenhagen, Denmark; Unit for Nutrition Research, Faculty of Food Science and Nutrition, University of Iceland, Reykjavík, Iceland
[3]EnviHeB Lab, Instituto de Saúde Ambiental, Faculdade de Medicina, Universidade de Lisboa, Lisbon, Portugal
[4]Department of Epidemiology, Boston University School of Public Health, Boston, MA, US; Environmental, Genetic and Nutritional Epidemiology Research Center (CREAGEN), Department of Biomedical, Metabolic and Neural Sciences, University of Modena and Reggio Emilia, Modena, Italy
[5]EnviHeB Lab, Instituto de Saúde Ambiental, Faculdade de Medicina, Universidade de Lisboa, Lisbon, Portugal; Unbreakable Idea Research, Cadaval, Portugal
[6]Unit of Cardiovascular and Nutritional Epidemiology, Institute of Environmental Medicine, Karolinska Institute, Stockholm, Sweden

BACKGROUND AND AIM: Acrylamide is a probable carcinogen in humans. The main source of exposure to acrylamide in the general population is through diet. We performed a systematic literature review and dose-response meta-analysis of epidemiological studies evaluating the associations between dietary intake and specific subtypes of cancers.
METHODS: A systematic literature search following PRISMA guidelines was conducted using Pubmed, Scopus and Web of Science until October 2020. Eligible studies included adults,assessment of dietary acrylamide (µg/day), risk estimates for increasing exposure to acrylamide, and cancer incidence.
Quality of papers was assessed using the NIH's Quality Assessment Tools for Observational Cohort and Case-Control Studies. We employed random-effects models comparing the highest versus the lowest intake of acrylamide and using the one-stage approach for dose-response meta-analysis.
RESULTS: Out of 835 studies screened 28 studies were eligible for this meta-analysis. A total of 1 109 365 (mean age 60 years, range 45-70 years) participants were included, of which 61957 developed cancer. The mean follow-up period was 15.1 years (range 7.3-33.9). Mean estimated dose of acrylamide intake across studies was 22.6 µg/day. Pooled HR showed that high intake of acrylamide (35 µg/day) vs low intake (10 µg/day) was associated with increased risk of hematological malignances (summary HR: 1.4 95%CI:1.03-1.23). Dose-response meta-analysis showed evidence of linear association. No clear associations were noted between high intake of acrylamide (vs low) and esophageal, stomach, pancreatic, lung, renal, bladder-urothelial, and prostate cancers. Similar results were observed in the smoking stratification analysis
CONCLUSIONS: From this dose-response meta-analysis of epidemiological studies investigating the association between dietary intake of acrylamide and specific subtypes of cancer, high intake of acrylamide was noted to be associated with increased risk of hematological malignancies. Further studies based on human biomonitoring data are needed to clarify the relationship of dietary acrylamide and cancers in humans.