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VENERDI 20 DICEMBRE 2019, ORE 12:30-15:40
SECONDA SESSIONE

ALIMENTAZIONE, AMBIENTE E SALUTE

Effect modification of smoking status and menopausal status on the association between dietary intake of acrylamide and risk of breast cancer

ADANI GIORGIA, FILIPPINI TOMMASO, VINCETI MARCO

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INTRODUCTION

Acrylamide is a probable human carcinogen¹ that occurs naturally in starchy foods during cooking processes at high temperatures². Aside from occupational exposures and smoking³, main source of human exposure is diet, particularly consumption of potatoes, grain products, and coffee^{4,5}. High acrylamide intake has been associated with altered sex-steroid hormone concentrations and increased risk of hormone-dependent cancers, such as breast neoplasm with inconsistent findings⁶⁻⁹. Since this cancer type represent a major cause of death among both premenopausal and postmenopausal women¹⁰, investigating its environmental and life-style risk factors, including for instance acrylamide intake, is of key relevance under a public health perspective.

MATERIALS AND METHODS

We performed a systematic review of the association between estimated dietary intake of acrylamide and risk of female breast cancer. Using PubMed, we performed a systematic search for non-experimental studies published through October 20, 2019 and we first performed a meta-analysis of the overall measure of association. Subsequently, we carried out a dose-response meta-analysis of these associations using restricted cubic spline models which allow to estimate the summary relative risk (sRR) across a large exposure range of acrylamide intake alongside with their approximate pointwise 95% confidence interval (CI)^{11,12}.

RESULTS

We identified 10 papers covering 8 different study populations: 9 cohorts and 1 case-control studies, with a total of 18100 cases of breast cancer. Acrylamide dietary intake ranged from 3.6 µg/day to 44 µg/day, with both mean and median values of 21 µg/day (range 6.3 to 29.8 µg/day). In the meta-analysis summarizing the RR in the highest category of exposure versus the lowest, we found no evidence of cancer risk at any levels of acrylamide exposure. After restricting the analysis to never smokers, we found similar results, if not a reverse correlation. In analyses stratified by menopausal status, we found no appreciable association between exposure and risk of breast cancer among premenopausal women, and an inverse association in postmenopausal participants. Results among never-smoking premenopausal women was available only for one study, which reported a positive association between acrylamide intake and breast cancer risk. Conversely, among postmenopausal women, we found no association for breast cancer in never-smokers. In the dose-response meta-analysis, we found evidence of a null or even inverse relation between exposure to dietary acrylamide and breast cancer risk,

particularly in never smokers and in post-menopausal women. Interestingly, in subgroup analysis limited to pre-menopausal women, breast cancer risk linearly increased starting from 20 µg/day of acrylamide intake.

CONCLUSIONS

In conclusion, there was limited evidence for an association between acrylamide intake and breast cancer risk, with the exception of increased risks at the highest levels of acrylamide exposure among premenopausal women, which warrants further investigation.

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