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Is selenium intake important in cancer risk?

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Editorial

The role of micronutrients in the prevention and progression of chronic diseases, particularly cancer, has become a major focus of contemporary biomedical and laboratory medicine research. Among these micronutrients, selenium, as an essential trace element with potent antioxidant properties, has attracted considerable attention in cancer research. Current evidence suggests that the association between selenium and cancer is not linear; rather, it follows a "U-shaped" relationship, indicating that both selenium deficiency and excessive selenium exposure may increase the risk of certain malignancies.

Studies conducted by my colleagues and me have also shown that the interpretation of selenium status should be considered in the context of nutritional factors, environmental exposures, oxidative stress, and individual patient characteristics. Maintaining selenium homeostasis appears to be more important than indiscriminate supplementation in the prevention and modulation of cancer-related processes.

An important concept emphasized in recent studies is the relationship between selenium and ferroptosis, an iron-dependent form of regulated cell death that plays a pivotal role in cancer biology. Emerging evidence indicates that selenoproteins, particularly glutathione peroxidase 4 (GPX4), are critically involved in regulating the susceptibility of cancer cells to ferroptosis. This finding has opened new perspectives for targeted cancer therapies and precision medicine approaches.

Today, medical laboratory sciences play a crucial role in the accurate assessment of trace elements and in providing reliable evidence for clinical decision-making. It is hoped that further evidence-based investigations in this field will contribute to more precise and personalized strategies for cancer prevention and management.

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