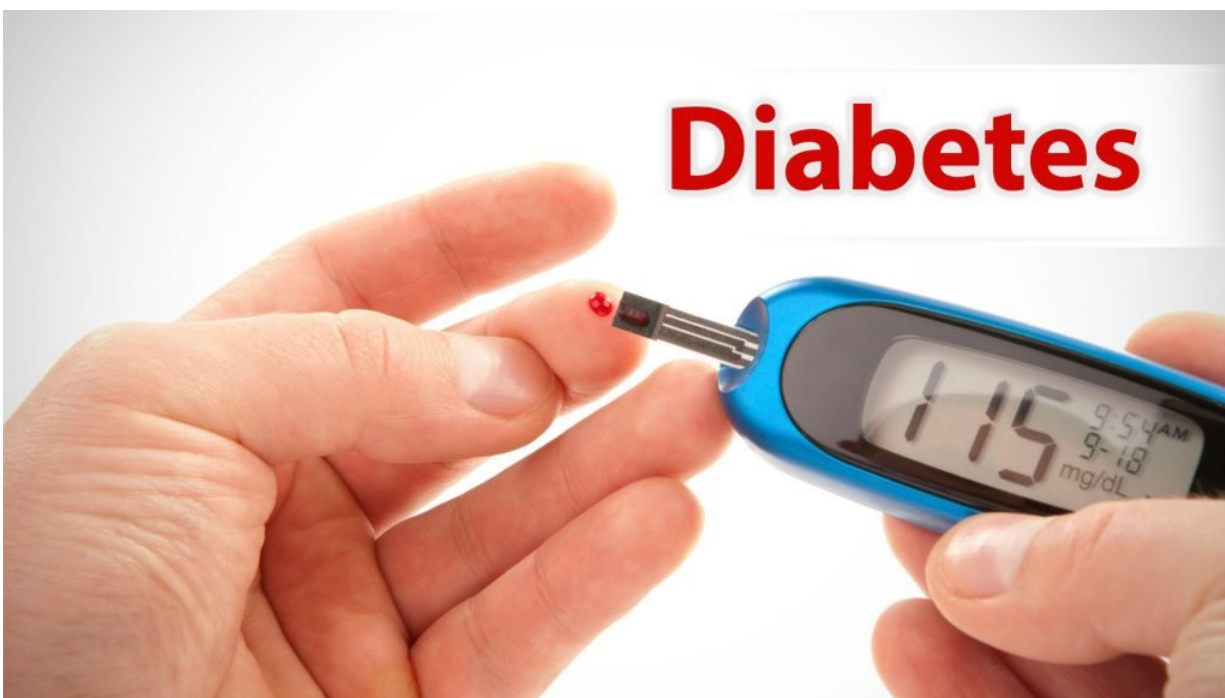


Scientists prove the role of zinc in type 2 diabetes mellitus

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Glucometer for measuring blood sugar. Credit: Alexei Tinkov

Researchers from RUDN University and P. G. Demidov Yaroslavl State University have demonstrated an association between changes in the concentration of trace elements in blood (especially zinc) with prediabetes. The obtained data suggest that zinc metabolism disorders play an important role in the development of diabetes. The results of the study were published in *Journal of Trace Elements in Medicine and*

Biology.

The one of the most important risk factors for the development of type 2 diabetes is age over 45 years. Women are especially vulnerable in postmenopause, the final stage of menopause, due to serious hormonal changes. 180 healthy and pre-diabetic representatives of this group were enrolled in the study.

"The study was based on the existing data on the role of individual trace elements (zinc, chromium, vanadium) in the [insulin](#) signal transduction. At the same time, it is believed that a number of toxic metals (cadmium, mercury) contribute to the development of insulin resistance (insulin resistance of tissues to the insulin signaling) and subsequently diabetes mellitus type 2," says Alexey A. Tinkov, the one of the authors of the article from RUDN University.

Type 2 diabetes mellitus is a chronic metabolic disease, affecting up to 6 percent of the worldwide population. There is an increase in blood glucose because tissues are unable to "grab" and utilize it. The main feature of this type of diabetes is the fact that the pancreas produces enough insulin, the hormone that makes body cells absorb glucose from blood, but the tissues do not respond to its signals.

Whether the disorders of trace element metabolism serve as the cause of [insulin resistance](#) is not yet well understood. New experimental data from RUDN University scientists suggest that a certain connection exists, although not for all elements (molybdenum, boron, strontium, and others) as shown in earlier works. The results of the research demonstrate the absence of significant changes for the majority of the trace elements studied. However, in the case of zinc, there is a 10 percent decrease of serum levels in women with prediabetes. It is well known that this [element](#) plays an important role in insulin synthesis in pancreatic beta cells and also enhances the susceptibility of body tissues

to the hormone.

"The results of the study underline the importance of investigation of zinc metabolism in [diabetes](#) pathogenesis. Moreover, we propose that the assessment of its level in the body may indicate a risk of the disease, as well as demonstrate the potential of [zinc](#)-containing food additives as a preventive measure," concludes Alexey Tinkov.

More information: Margarita G. Skalnaya et al, ICP-DRC-MS analysis of serum essential and toxic element levels in postmenopausal prediabetic women in relation to glycemic control markers, *Journal of Trace Elements in Medicine and Biology* (2017). [DOI: 10.1016/j.jtemb.2017.09.008](#)

Provided by RUDN University

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