

Is nicotinamide overload a trigger for type 2 diabetes?

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Facing the increasing prevalence of type 2 diabetes worldwide in the past few decades, one may ask what is wrong with humans. Geneticists tell us that the human genome has not changed markedly in such a short time. Therefore, something must be happening in our environment or diet. As a matter of fact, dietary pattern is known to be closely linked to the development of type 2 diabetes. The increasing prevalence of type 2 diabetes following worldwide food fortification with niacin suggests that type 2 diabetes may involve excessive niacin intake.

A research article to be published on December 7, 2009 in the [World Journal of Gastroenterology](#) addresses the association between nicotinamide overload and type 2 diabetes. The study revealed that diabetic patients have a slow nicotinamide metabolism and thus require a longer time to clear up excess nicotinamide metabolites within the body. High nicotinamide intake may lead to an increase the generation of reactive oxygen species, and subsequent oxidative stress and insulin resistance, both being the major features of type 2 diabetes.

Liver is the main organ responsible for nicotinamide detoxification. This study found that liver-injury-inducing drugs may reduce nicotinamide detoxification and thus impair [glucose tolerance](#). Most interestingly and importantly, this study demonstrates that sweating is an effective way for expelling excess nicotinamide from the body. The findings from this study may help explain a wide variety of well-documented but poorly understood phenomena in diabetes, such as lifestyle-triggered diabetes, liver-disease-related abnormal [glucose metabolism](#), post-burn insulin

resistance, and seasonal diabetes.

Nowadays, the high prevalence of type 2 diabetes may be due to both too much niacin in our foods and too little excretion through our [sweat glands](#). The so-called gene-environment interaction in type 2 diabetes may actually be the outcome of the association of excess niacin intake and relatively low [detoxification](#) and excretion from the body, says lead author Dr. Shi-Sheng Zhou, Professor of the Institute of Basic Medical Sciences of Dalian University.

Historically, niacin deficiency was restricted mainly to those with poor nutrition who performed heavy industrial labor. Hence, this study gives rise to an important social and public health issue whether foods need to be fortified with niacin any more, when the people in developed countries have already been living in an age of over-nutrition. The authors found that reducing nicotinamide intake and facilitating the excretion of nicotinamide metabolites may be a useful preventive and therapeutic intervention in [type 2 diabetes](#).

The peer reviewers stated that it is an interesting study with human and experimental data, which investigated a clinically relevant issue, and gave an insight into the pathogenic mechanisms involved.

More information: Zhou SS, Li D, Sun WP, Guo M, Lun YZ, Zhou YM, Xiao FC, Jing LX, Sun SX, Zhang LB, Luo N, Bian FN, Zou W, Dong LB, Zhao ZG, Li SF, Gong XJ, Yu ZG, Sun CB, Zheng CL, Jiang DJ, Li ZN. Nicotinamide overload may play a role in the development of type 2 diabetes. World J Gastroenterol 2009; 15(45): 5674-5684, www.wjgnet.com/1007-9327/15/5674.asp

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