TNT-CVD

Trimethylamine as a Nitrogenous Toxin in Cardiovascular Diseases

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Morbidity and mortality due to cardiovascular diseases such as hypertension (high blood pressure) and heart failure and their complications are alarmingly high in Poland and in many other countries.

Wide gaps in the knowledge of physiological and pathological processes that occur in the circulatory system hinder the development of new and more effective preventive and therapeutic measures.

Trimethylamine (TMA) is a small molecule which exerts toxic effects. TMA is manufactured on the order of thousands of tons worldwide. It is used for manufacturing plastics, disinfectants, insect attractants, intense sweeteners, seafood flavor and many other compounds. TMA is also an air pollutant.

My initial research suggests that an important source of TMA in mammals is endogenous production by cells. Specifically, TMA seems to be a waste product of metabolism of several nutrients. Furthermore, TMA concentration is increased in patients with cardiovascular diseases.

The study aims to investigate:
1. The origin of TMA in mammalian tissues in health and in cardiovascular disease.
2. The effect of cardiovascular risk factors such as nicotine, high-salt intake and high-fat intake on plasma TMA levels.
3. To evaluate mechanisms responsible for TMA accumulation and elimination from the organism.

The results of the study may bring new diagnostic, preventive, and pharmacological strategies aimed at the reduction of TMA levels in cardiovascular diseases. Furthermore, since TMA is an air pollutant the results of the study will broaden the knowledge on the impact of air pollution on the circulatory system.