

NEWS in Brief

INCREASED NITROSAMINE AND NITRITE EXPOSURE PARALLEL INCREASED DEATH RATES IN DIABETES AND OTHER DISEASES.

The authors from Brown University and Rhode Island Hospital have found that the increase in mortality rates for diabetes, Alzheimer's disease, and Parkinson's disease in recent decades parallel increased exposure to nitrosamines, nitrate and nitrites in the food supply and environment. The chemicals can induce DNA damage, oxidative stress, cell death, and cancer. They are also associated with insulin resistance.

The authors noted that insulin resistance is a characteristic of normal aging; and is also seen in diabetes, Alzheimer's disease, and Parkinson's disease. They proposed that the rates of these diseases have increased so rapidly in recent decades that exposure to these chemicals might be to blame. The routes of exposure included were through food, smoking, and use of products like fertilisers. Some nitrosamines are deliberately added to food. For example, sodium nitrite, is added to meat and fish to prevent *Clostridium botulinum* toxin production. It is also used to flavour meats. Exposures to these chemicals also occur through the use of rubber and latex products, fertilizers, pesticides, and cosmetics. The authors said a potential solution would be to eliminate the use of nitrites and nitrates in food processing and preservation and in agriculture; prevent formation of nitrosamines; and detoxifying food and water prior to consumption.

To test their hypothesis (of a possible connection between nitrosamine exposure and the diabetes, Alzheimer's disease, and Parkinson's disease), the authors tracked mortality trends from 1968 to 2005.



From 1968 to 2005, mortality rates for Alzheimer's disease increased 150 times in persons aged 75 to 84, and 800 times in those 85 and older. From 1980 to 2005, mortality rates increased 3 times (ages 75 to 84 years) and 6 times (age 85 and older) (data on Parkinson's disease were available only after 1980). Death rates for diabetes reached a low in 1980 and increased until 2005, and reached a plateau in the last few years.

These patterns were compared with indirect measures of exposure to nitrosamines from 1955 to 2005 – use of nitrite-containing fertilisers, consumption of fast food, consumption of grain, and major meat processing company sales.

Nitrogen-containing fertiliser use increased 230% from 1955 to 2005, and doubled from 1960 to 1980, just preceding the insulin-resistance epidemics, according to the authors. Sales

of fast food and of a meat processing company increased over 8 times from 1970 to 2005. Grain consumption increased 5 times.

The authors concluded that there were strong parallels between increases in mortality rates of these diseases, and exposure to nitrites and nitrosamines through food, water, and agriculture. They felt that efforts should be made to significantly reduce exposure to nitrates and nitrites, and that biotechnology should be developed to monitor cellular and tissue injury linked to nitrosamine-mediated insulin resistance. **SMA**

Source: De la Monte S, et al. Epidemiological trends strongly suggest exposures as etiologic agents in the pathogenesis of sporadic Alzheimer's disease, diabetes mellitus, and non-alcoholic steatohepatitis. *J Alzheimer's Dis* 2009; 17:519-29.