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Xenobiotics and Chronic Disease

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Introduction

One of the cell organelles is mitochondria. Mitochondria is the production place of ATP as energy source. Mitochondrial dysfunction plays an important role in the patho physiology of age-related chronic diseases such as metabolic syndrome, diabetes, coronary artery disease, acute coronary syndrome, stroke, Alzheimer's disease, Parkinson's, depression and cancer [1]. Chronic diseases are leading cause of mortality in the World [2].

As ATP production decreases in mitochondrial dysfunction, free oxygen radicals and free nitrogen radicals also increase. Decreased production of ATP causes complaints of fatigue and weakness. Increased production of free oxygen radicals and free nitrogen radicals damages lipid, protein, DNA structure in the cell and causes apoptosis, inflammation and cancer [3,4].

Xenobiotics disrupt mitochondrial function and cause free oxygen radical and free nitrogen radical formation [5]. People are exposed to xenobiocycles in the environment they live. This editorial article will mention some xenobiotics in diesel exhaust, red meat, bread and others that have significant impacts on human and community health.

The National Cancer Institute and the American Cancer Society report that the evidence supports an association between diesel exhaust exposure and increased risk of lung and other cancers including cancers of bladder, larynx (voice box), esophagus, stomach and pancreas. Diesel exhaust was classified as "A Group 1 Carcinogen" [6,7]. Transition metals such as Fe, Zn, Cr, Pb, V, Ni and polycyclic aromatic hydrocarbons (PAHs) amount is high in diesel exposure. These chemicals trigger lung disease and cancer [8].

Epidemiological studies suggesting that small increases in the risk of several cancers may be associated with high consumption of red-meat. Chemicals such as Heterocyclic Amines (HCAs) are formed when meat is cooked well-done at high temperature. HCAs has strong carcinogenic potential in animals. Red-meat was classified as Group 2A, probably carcinogenic to human in October 2015 [9,10]. Another important xenobiotic is acryilamide. When the whole or refined grain is exposed to high temperature during bread production, acryilamide is formed in bread. Acryilamide has been shown to be carcinogenic in animals, and is classified as "Likely to be Carcinogenic to Humans" [11]. Whole grain bread should be consumed to reduce the risk.

Vegetables are an important source of food for human. But pesticide residues were identified in chemical analyzes. The World Health Organization has emphasized that the unsafe food can contain harmful bacteria, viruses, parasites or chemical substances and cause more than 200 diseases ranging from diarrhea to cancers. But still it was stated that the health benefits of consuming vegetables and fruits would be greater than the estimated risk of exposure to pesticides [12,13].

Another common example is food contact materials. Food conctact materials cause food to be exposed to chemicals such as polycarbonate plastics derivatives.One of the chemicals of polycarbonate plastics is Bisphenol A. United States Environmental Protection Agency advised to protect sensitive populations, particularly infants and young children against bisphenol Aexposure [14,15].

Finally, there is intense exposure to xenobiotics in our daily lives. WHO has announced April 7th as World Health Day under the slogan "From farm to plate, make food safe". To keep the subject up to date [13].

References

1. Picard M, Wallace DC, Burelle Y (2016) The rise of mitochondria in medicine.Mitochondrion 30: 105-116.
2. Chronic diseases and health promotion.
3. Hoye AT, Davoren JE, Wipf P, Fink MP, Kagan VE (2008) Targeting Mitochondria. Acc Chem Res 41(1): 87-97.
4. Khansari N, Shakiba Y, Mahmoudi M (2009) Chronic inflammation and oxidative stress as a major cause of age-related diseases and cancer. Recent Pat Inflamm Allergy Drug Discov 3(1): 73-80.
5. Kehrer JP, Klotz LO (2015) Free radicals and related reactive species

as mediators of tissue injury and disease: implications for Health. Crit Rev Toxicol 45(9): 765-798.

6. Diesel Exhaust and Cancer Risk Public Health Impact of DCEG Research.
7. https://www.cancer.org/cancer/cancer-causes/diesel-exhaust-and-cancer.html
8. Longhin E, Gualtieri M, Capasso L, Bengalli R, Mollerup S, et al. (2016) Physico-chemical properties and biological effects of diesel and biomass particles. Environ Pollut 215: 366-375.
9. Gilsing AM, Berndt SI, Ruder EH, Graubard BI, Ferrucci LM, et al. (2012) Meat-related mutagen exposure, xenobiotic metabolizing gene polymorphisms and the risk of advanced colorectal adenoma and cancer. Carcinogenesis 33(7): 1332-1339.
10. Q & A on the carcinogenicity of the consumption of red meat and processed meat. WHO.
11. https://www.cancer.org/content/cancer/en/cancer/cancer-causes/acrylamide/
12. Bach FA, Berry EM, Lairon D, Reguant J, Trichopoulou A, et al. (2011) Mediterranean diet pyramid today. Science and Cultural Updates. Public Health Nutr 14(12A): 2274-2284.
13. World Health Day 2015: From farm to plate, make food safe.
14. Muncke J (2011) Endocrine disrupting chemicals and other substances of concern in food contact materials: an updated review of exposure, effect and risk assessment. J Steroid Biochem Mol Biol 127(1-2): 118-127.
15. https://www.epa.gov/assessing-and-managing-chemicals-under-tsca/risk-management-bisphenol-bpa

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