De Lucaa C., Scordob MG., Cesareoa E., Pastorea S., Mariania S., Maiania G., Stancatoa A., Loretic B., Valacchid G., Lubranoc EC., Raskovicf D., De Padovac L., Genovesic G., Korkina LG., Biological definition of multiple chemical sensitivity from redox state and cytokine profiling and not from polymorphisms of xenobiotic-metabolizing enzymes,

Toxicology and Applied Pharmacology, November 2010.

L'équipe italienne de Lucaa et al parue en avril 2010 dans « toxicology and applied pharmacology » confirme la théorie élaborée par Martin PALL.

Les objectifs de l'étude étaient la recherche de marqueurs génétiques immunologiques et métaboliques du MCS.

L'étude est particulièrement probante quant à la question de la théorie du cycle NO/ONOO car elle démontre que 3 éléments de ce cycle sont présents en quantité plus importante chez les patients atteints de MCS que dans la population générale.

Ces éléments sont : les cytokines inflammatoires, l'oxyde nitrique et le stress oxydadif.

Définition biologique du MCS par l'équipe italienne Chiara de Lucaa et al

Biological definition of multiple chemical sensitivity from redox state and cyto- kine profiling and not from polymorphisms of xenobiotic-metabolizing enzymes

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Abstract

Background

Multiple chemical sensitivity (MCS) is a poorly clinically and biologically defined environ- ment-associated syndrome. Although dysfunctions of phase I/phase II metabolizing enzymes and redox imbalance have been hypothesized, corresponding genetic and metabolic parame- ters in MCS have not been systematically examined.

Objectives

We sought for genetic, immunological, and metabolic markers in MCS.

Methods

We genotyped patients with diagnosis of MCS, suspected MCS and Italian healthy controls for allelic variants of cytochrome P450 isoforms (CYP2C9, CYP2C19, CYP2D6, and CYP3A5), UDP-glucuronosyl transferase (UGT1A1), and glutathione S-transferases (GSTP1, GSTM1, and GSTT1). Erythrocyte membrane fatty acids, antioxidant (catalase, superoxide dismutase (SOD)) and glutathione metabolizing (GST, glutathione peroxidase (Gpx)) en- zymes, whole blood chemiluminescence, total antioxidant capacity, levels of nitrites/nitrates, glutathione, HNE-protein adducts, and a wide spectrum of cytokines in the plasma were determined.

Results

Allele and genotype frequencies of CYPs, UGT, GSTM, GSTT, and GSTP were similar in the Italian MCS patients and in the control populations. The activities of erythrocyte catalase and GST were lower, whereas Gpx was higher than normal. Both reduced and oxidised glutathione were decreased, whereas nitrites/nitrates were increased in the MCS groups. The MCS fatty acid profile was shifted to saturated compartment
and IFNgamma, IL-8, IL-10, MCP-1, PDGFbb, and VEGF were increased.

Conclusions

Altered redox and cytokine patterns suggest inhibition of expression/activity of metabolizing and antioxidant enzymes in MCS. Metabolic parameters indicating accelerated lipid oxidation, increased nitric oxide production and glutathione de- pletion in combination with increased plasma inflammatory cytokines should be considered in biological definition and diagnosis of MCS.