IEH Institute of Environment and Health

Cranfield UNIVERSITY

Manganese Health Research Program: Recent published literature

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Prepared by Lini Ashdown & Ruth Bevan

Institute of Environment and Health
Cranfield University
Vincent Building
Cranfield
Bedfordshire
MK43 0AL
UK
http://www.cranfield.ac.uk/health/ieh

Introduction

This report presents the bibliographic details of papers identified as being first published during the period April 2011 to June 2011.

The papers were selected because they address research areas that are considered of direct relevance to the health effects of manganese (Mn); in order to aid review, the papers are presented under the following categories:

Section 1 - EXPOSURE MEASUREMENT AND MODELLING: Papers relating to the measurements or modelling of environmental and occupational Mn exposure, the development of biomarkers of exposure or effect.

Section 2 - HEALTH EFFECTS: Papers on the influence of Mn on health, disease and dysfunction.

Section 3 - MECHANISM: Papers on the physiological, biochemical and cellular mechanisms underlying the toxic effects of Mn.

Section 4 - HUMAN SUSCEPTIBILITY: Papers relating to assessment of the influence of genetic and epigenetic factors on human susceptibility to the effects of Mn.

Section 5 - TREATMENT AND IMAGING: Papers on the development and implementation of new medical approaches to the treatment of excessive Mn exposure.

Section 6 - MISCELLANEOUS: Other papers considered of interest or potential relevance to the study of the health effects of Mn.

The papers presented herein were identified using a series of structured searches of the following on-line databases: Medline, Toxline, Biological Sciences and Scopus. The paper abstracts were reviewed and categorised by an experience Scientist to confirm their relevance before inclusion in this report.

1. EXPOSURE MEASUREMENT AND MODELLING

Alimonti, A., Bocca, B., Mattei, D.*, et al* (2011) *Programme for Biomonitoring the Italian Population Exposure (PROBE): Internal Dose of Metals.* Rapporti ISTISAN 11/9. Istituto Superiore di Sanità, Rome. Available at: http://www.iss.it/binary/publ/cont/11_9_web.pdf

Barbeau, B., Carriere, A. & Bouchard, M.F. (2011) Spatial and Temporal Variations of Manganese Concentrations in Drinking Water. *Journal of Environmental Science and Health-Part A,* 46(6), 608-616.

Basu, N., Nam, D., Kwansaa-Ansah, E.*, et al.* (2011) Multiple Metals Exposure in a Small-Scale Artisanal Gold Mining Community. *Environmental Research,* 111(3), 463-467.

Batool, A.I., Rehman, F.U., Naveed, N.H.*, et al.* (2011) Hairs as Biomonitors of Hazardous Metals Present in a Work Environment. *African Journal of Biotechnology,* 10(18), 3602-3607. Available at: http://www.academicjournals.org/AJB/PDF/pdf2011/2May/Batool%20et%20al.pdf

Bocca, B., Madeddu, R., Asara, Y.*, et al.* (2011) Assessment of Reference Ranges for Blood Cu, Mn, Se and Zn in a Selected Italian Population. *Journal of Trace Elements in Medicine and Biology,* 25(1), 19-26.

Husaini, S., Zaidi, J., Matiullah*, et al.* (2011) Metal Poisoning and Human Health Hazards due to Contaminated Salad Vegetables. *Journal of Radioanalytical and Nuclear Chemistry,* 287, 543-550.

Schroeter, J.D., Nong, A., Yoon, M.*, et al.* (2011) Analysis of Manganese Tracer Kinetics and Target Tissue Dosimetry in Monkeys and Humans with Multi-Route Physiologically Based Pharmacokinetic Models. *Toxicological Sciences,* 120(2), 481-498.

2. HEALTH EFFECTS

Corradi, M. & Mutti, A. (2011) Metal Ions Affecting the Pulmonary and Cardiovascular Systems. *Metal Ions in Life Sciences,* 8, 81-105.

Criswell, S.R., Perlmutter, J.S., Videen, T.O.*, et al.* (2011) Reduced Uptake of [18F] FDOPA PET in Asymptomatic Welders with Occupational Manganese Exposure. *Neurology,* 76(15), 1296-1301.

Huang, P., Chen, C., Wang, H.*, et al.* (2011) Manganese Effects in the Liver Following Subacute Or Subchronic Manganese Chloride Exposure in Rats. *Ecotoxicology and Environmental Safety,* 74(4), 615-622.

Negga, R., Rudd, D.A., Davis, N.S.*, et al.* (2011) Exposure to Mn/Zn Ethylene-Bis-Dithiocarbamate and Glyphosate Pesticides Leads to Neurodegeneration in Caenorhabditis Elegans. *Neurotoxicology,* 32(3), 331-341.

Pohl, H.R., Roney, N. & Abadin, H.G. (2011) Metal Ions Affecting the Neurological System. *Metal Ions in Life Sciences,* 8, 247-262.

Sen, S., Flynn, M.R., Du, G.*, et al.* (2011) Manganese Accumulation in the Olfactory Bulbs and Other Brain Regions of "Asymptomatic" Welders. *Toxicological Sciences,* 121(1), 160-167.

3. MECHANISM

Ando, M., Ueda, K., Okamoto, Y.*, et al.* (2011) Combined Effects of Manganese, Iron, Copper, and Dopamine on Oxidative DNA Damage. *Journal of Health Science,* 57(2), 204-209.

Hiney, J.K., Srivastava, V.K. & Dees, W.L. (2011) Manganese Induces IGF-1 and Cyclooxygenase-2 Gene Expressions in the Basal Hypothalamus during Prepubertal Female Development. *Toxicological Sciences,* 121(2), 389-396.

Kern, C.H. & Smith, D.R. (2011) Preweaning Mn Exposure Leads to Prolonged Astrocyte Activation and Lasting Effects on the Dopaminergic System in Adult Male Rats. *Synapse,* 65(6), 532-544.

Manfo, F.P., Chao, W.F., Moundipa, P.F.*, et al.* (2011) Effects of Maneb on Testosterone Release in Male Rats. *Drug and Chemical Toxicology,* 34(2), 120-128.

Peneder, T.M., Scholze, P., Berger, M.L.*, et al.* (2011) Chronic Exposure to Manganese Decreases Striatal Dopamine Turnover in Human Alpha-Synuclein Transgenic Mice. *Neuroscience,* 180, 280-292.

4. HUMAN SUSCEPTIBILITY

No relevant papers identified.

5. TREATMENT AND IMAGING

Fernandes, J.L., Storey, P., da Silva, J.A., *et al.* (2011) Preliminary Assessment of Cardiac Short Term Safety and Efficacy of Manganese Chloride for Cardiovascular Magnetic Resonance in Humans. *Journal of Cardiovascular Magnetic Resonance* [Online Journal], 13, 6. Available at: http://www.biomedcentral.com/content/pdf/1532-429X-13-6.pdf

6. MISCELLANEOUS

Hozumi, I., Hasegawa, T., Honda, A.*, et al.* (2011) Patterns of Levels of Biological Metals in CSF Differ among Neurodegenerative Diseases. *Journal of the Neurological Sciences,* 303(1-2), 95-99.

Ljung, K. & Vahter, M. (2011) Time to Re-Evaluate the Guideline Value for Manganese in Drinking Water? *Drug Topics,* 155(1), 1533-1538.

Silver, S. (2011) BioMetals: A Historical and Personal Perspective. *Biometals,* 24(3), 379-390.