

## **International Conference 19 – 21 september, 2016**

### **Work, Age, Health and Employment** **[www.WAHE2016.uni-wuppertal.de](http://www.WAHE2016.uni-wuppertal.de)**

#### **Brown Bag Session 2:**

**Title:** *The Emergents Diseases: multiple chemical sensibility syndrome; chronic fatigue syndrom; fibromyalgia.*

#### **Thematic contribution:**

The relationship between work, environmental conditions and health is becoming better known nowadays. Environmental conditions have great impact on public health, causing new, multiple, organic diseases / syndromes (the so-called environmental diseases), systemic diseases, chronic, disabling and even potentially carcinogenic diseases (as already recognized by the WHO), such as multiple chemical sensitivity syndrome, chronic fatigue syndrome, fibromyalgia syndrome and sensitivity to electromagnetic fields.

Chemical risks are potential hazards in many workplaces, either because we work directly with them, for example in the chemical industry; or because they are applied occasionally externally, for example when fumigating various places. Many of these hazardous products are present in the workplace, and have a toxic potential which directly affects human health, even in non-toxic doses.

Although still not well known by that mechanism. It is believed that an initial exposure, these substances can act as initiators stimuli, leading to a decrease in the response threshold bodies, so in the presence of

other potentially like the same of stimuli responses would be triggered. The consequence of this is that it is accepted that there is a relationship between an exposure and a disease, even without a clear exposure-response relationship (dose response)<sup>1</sup>.

Organophosphates (OPs) are found in a variety of substances, such as metals, various organic solvents and fumes. They are potential endocrine disruptors. Many are already recognized by the WHO in European Chemicals Census, Endocrine Disruptors<sup>2</sup>.

These substances can cause multiple organ and systemic symptoms in the human body, constituting a group of disorders with an environmental/labor relationship, such symptoms as well as "emerging". They give rise to symptoms of chronic fatigue, generalized musculoskeletal pain, puberties and early menopauses; digestive disorders, respiratory, skin and central nervous system, among others. They have been characterized and being named and chemical ranging from multiple sensibility syndrome; chronic fatigue syndrome; fibromyalgia syndrome and sensitivity to electromagnetic fields.

Other occupational factors, such as stress, make the most vulnerable to toxic <sup>3</sup>. There are people, including differences between women and men on the demonstration and the risk to these factors: women are mostly fat soluble than men, when the toxic products stayed accumulators (the women are bio-accumulators), as well as the estrogenic potential by presenting their biology. This is a biologic difference, and it is very important to pay attention on the occupational medicine, for example.

For 20 years, the team of CAPS, Centre d'Analyses i Programes Sanitaris, a non- governmental scientific organization <sup>4</sup>, belong to WECF <sup>5</sup>, analyzed during 30 years one more group of women who had been exposed to organophosphates in their workplace and analyzed as chronic use, and even low doses repeated can cause environmental diseases, as described in "Exploratory study of signs, symptoms and analytical parameters variation in women exposed to organophosphates in Their Workplaces: prospective study of 20 years"<sup>6</sup>.

In the same time, as we can see on the exploratory study, the affectation health of the workers in question, is characterized by chronic, disabling and limiting symptoms that led to 100% from their workplaces, to get in some cases the recognition of occupational diseases, to get absolute disability and life, and in most to change their life habits "normal" and common in industrialized societies.

Still much remains to study these diseases, diagnostic tests, therapeutic management, but every day is more conclusive of the important relationship between working conditions and suffer from these diseases, as well as the importance of prevention. Thus, by gravity, frequency and chronicity of these pathologies is essential to the scientific discussion where explore methods to prevention, recognition of these conditions and are jointly that focus on laws created:

- 1- Create a multidisciplinary team, to address these diseases Pesticides and working conditions;
- 2- Buildings conditions;
- 3- Do a Consensus document on women and chemical exposure, with a multidisciplinary experts<sup>7</sup>;

- 4- Research funding for women, health and environmental;
- 5- Medical Formation: information and news formation of the health professionals and medical attention about the emergent diseases, with more attention on the occupational health;
- 6- Create a women clinical research, and environmental diseases;
- 7- Do to courses of gender, health and environmental;
- 8- Do prevention and care of environmental / working conditions.

### **Bibliography:**

1. NNT 557. Ministerio Salud, España. Obiols.
2. European Chemicals Census, Endocrine Disruptors
3. “El estrés hace más vulnerables la entrada de tóxicos al organismo”, Carme Valls Llobet, La Vanguardia, 05/2016
4. CAPS: Centre d’Anàlisi i Programes Sanitaris: <http://www.mys.matriz.net>
5. [www.wecf.eu/](http://www.wecf.eu/): **Women** in Europe for a **Common Future** (WECF).
- 6 A scientific article to republished
7. [www.medioambiente.ue](http://www.medioambiente.ue); (upgrade 2011, created by the Spanish Ministry of Health that brought together multiple multidisciplinary experts on the subject).

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#### **ABSTRACT:**

**Keywords:** organophosphorates; COPNID; thyroid hormone; liposoluble bioaccumulation; endocrine disruption;

Chemical risks are potential hazards in many workplaces, either because we work directly with them, for example in the chemical industry; or because they are applied occasionally externally, for example when fumigating various places. Many of these hazardous products are present in the workplace, and have a toxic potential which directly affects human health, even in non-toxic doses.

The relationship between work, environmental conditions and health is becoming better known nowadays. Environmental conditions have great impact on public health, causing new, multiple, organic diseases / syndromes (the so-called environmental diseases), systemic diseases, chronic, disabling and even potentially carcinogenic diseases (as already recognized by the WHO), such as multiple chemical sensitivity syndrome, chronic fatigue syndrome, fibromyalgia syndrome and sensitivity to electromagnetic fields.

Organophosphates (OPs) are found in a variety of substances, such as metals, various organic solvents and fumes. They are potential endocrine disruptors. Many are already recognized by the WHO in European Chemicals Census, Endocrine Disruptors<sup>2</sup>.

Organophosphates have been used as insecticides worldwide for more than 50 years. Worldwide, an estimated 3,000,000 people are exposed to OPs each year, with up to 300,000 fatalities. OPs are potent cholinesterase inhibitors capable of causing severe cholinergic toxicity following cutaneous exposure, inhalation, or ingestion. The toxic effects of OPs differ with respect to reversibility and severity. However, neither reported symptoms nor performances after an OP exposure predicted the effects after a subsequent exposure-free interval, and the measurement of the internal exposure is still not easy to assess. Following a study of 20 years (1994-2013), we evaluated 43 women

who were exposed to OPs in their workplaces. Signs and symptoms of exposure were identified, and ferritin (Ft), thyroid stimulating hormone (TSH), acetylcholinesterase (AChE), pyruvic acid (PA) and lactic acid (LA) levels were measured and analysed by multivariate statistical analysis.

The results show that the main signs and symptoms reported were asthenia (98%), muscle aches (78%), menstrual cycle changes (36%), respiratory changes (27%), central nervous system changes (27%) and peripheral nervous system changes (11%). Ft contents revealed an iron deficiency (42.28 mg/dl) on admission that had a significant increase during treatment. A similar trend was also observed for TSH although the contents remained within the normal range. Concerning AChE, the results showed an extremely significant decrease over time especially between the admission (6327.74 U/mL) and last valuation (4658.74 U/mL). Regarding PA and LA, both contents increased significantly over time. These results suggest that OP exposure affects different organic systems, and reveals the need to make embracing studies that enable a better understanding of this subject.