HEALTH SURVEILLANCE ACCORDING TO THE NEW EU DIRECTIVE 2013/35/EU: POSSIBLE CRITERIA

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ABSTRACT

In a discussion on possible criteria for health surveillance (HS) of workers exposed to electromagnetic fields (EMF) it should be stated beforehand that the new EMF Directive 2013/35/EU specifically refers to the protection from the risks associated with known direct biophysical and indirect effects caused by EMF (0 – 300 GHz), while does not address to suggested long-term effects. HS of EMF exposed workers should be performed based on the results of the risk assessment, but until now no international guidelines or authoritative documents on criteria to be applied are available. A further specific problem is HS of workers "at particular risk", as: a) no shared comprehensive definition of these workers is currently available, and b) an adherence to the ELVs of the Directive 2013/35/UE do not necessarily provide an adequate protection workers at particular risk and e.g. interference problems, especially with pacemakers, may occur at lower levels. As a conclusion, at present the problem concerning the HS of workers exposed to EMF is that sound scientific data, especially on groups at higher risk, are largely insufficient, and do not give an adequate support to the occupational physician to face the problem; accordingly, no consensus exists regarding adequate procedures to be applied

Key words: *Directive 2013/35/EU, health surveillance, exposed workers, workers "at particular risk"*

1. INTRODUCTION

The new EU Directive 2013/35/EU provides specific measures for the protection of workers from "the health and safety risks related to exposure to static electric, magnetic and time-varying electric, magnetic and electromagnetic fields with frequencies up to 300 GHz (EMF)" during work (Art. 2). One of the measures is implementation of an "appropriate health surveillance" (HS).

The problem here is that HS of EMF exposed workers is a problem still open in occupational medicine. In fact, while guidelines exist on various other aspects, until now no authoritative guidelines/documents are available on this topic.

An open discussion among occupational physicians and the other involved occupational professionals on the scope and main criteria for the definition and implementation of HS of EMFs exposed workers should be highly suitable. Here some criteria are presented and discussed.

2. METHOD

In a discussion on possible criteria for health surveillance (HS) of workers exposed to electromagnetic fields (EMF) it should be observed that the present EMF Directive 2013/35/EU specifically refers to the protection from the risks associated with known direct biophysical and indirect effects caused by EMF (0 – 300 GHz), while does not address to suggested long-term effects since scientific evidence of a causal relationship is considered not conclusive.

Taking into account this premise, the objective of health surveillance according to the Directive 2013/35/EU is the prevention, or the early diagnosis, of any adverse health effect in workers associated to occupational exposure to EMF.

3. DISCUSSION

An extensive body of research is available on possible effects of EMFs: thousands of scientific studies have been performed, and several hundreds of scientific papers have been published: just to give an idea, in the "EMF Portal", a web-based information platform collecting scientific information regarding the effects of electromagnetic fields on humans and on interaction with biological systems or body aids implemented by the Clinic of Occupational Medicine of Aachen University 19.608 scientific publications are collected (http://www.emf-portal.de/_index.php?l=e, last accessed: July 2, 2014). It is evidently impossible to discuss in details literature, but authoritative reviews as the Environmental Health Criteria of the World Health Organization (WHO) and several other, are available (1-5).

In very general terms, possible adverse health effects related to EMF exposure can be classified in short- and long-term. The former can be further classified as direct biophysical effects including thermal and non-thermal effects, and indirect effects including contact currents, interference, and others. Long-term effects entail several different suspected effects, such as cancer, neurodegenerative diseases, and others (4, 5).

As anticipated, the new European Directive 2013/35/EU specifically refers to the protection from the risks associated with known short-term effects only.

As a consequence, specific objectives of HS performed according to this directive should be considered:

1) The prevention of any thermal and non-thermal established effect, such as the stimulation of muscles, nerves, sensory organs (including temporary annoyance or effects on cognition), and limb currents;

2) The health and safety of workers that can be considered "at particular risk," such as workers with active or passive implanted medical devices (cardiac pacemakers, insulin pumps, cochlear implants, etc.) and pregnant workers; nevertheless, a shared comprehensive definition of the workers, and conditions, that should be considered "at particular risk" is admittedly lacking (1-5).

Medical examinations for HS should be performed based on the results of the completed risk assessment according to the EU Directive 2013/35. Clinical evaluation should be mainly based on the collection of anamnestic data, including clinical symptoms, and on a comprehensive physical examination, while specific laboratory tests are currently not considered required, except on an individual clinical basis.

Furthermore, appropriate medical examinations, or individual health surveillance, must be provided in cases where undesired or unexpected health effects presumably related to EMF are reported by workers, or in any event where an acute overexposure, i.e., an exposure above the Exposure Limit Values (ELVs), is detected. The investigation procedure depends on how well the exposure situation is known, and on the symptoms and signs presented from the subject. The more usual clinical symptoms in case of overexposure to radiofrequency fields are acute skin or eye reactions, but symptoms to the nervous system (both CNS and/or PNS) are also possible depending on the EMF frequency range, level, etc. (6). Accordingly, HS should usually include an accurate overall clinical evaluation (dermatological, ophthalmological, neurological); specialist(s) consultation and appropriate laboratory tests should also be considered on an individual clinical basis.

Regarding subjects who can be considered "at particular risk," the number among active workers is progressively increasing. The more sophisticated technology can, at least in some cases, be vulnerable to adverse effects of the external EMF fields. A relevant aspect to be considered here is the fact that an adherence to the ELVs of the Directive 2013/35/UE should provide an adequate protection with regards to the established adverse health effects, but not necessarily in workers at particular risk, e.g., interference problems, especially with pacemakers, may occur at lower levels (7,8). Procedures for health risk assessment in workers with implanted medical devices are available (9-11). Regarding pregnant workers, the overall evidence for developmental effects and reproductive effects is currently considered inadequate (1-5), but the problem related to concern, and consequently, anxiety, should be taken into account; in such cases, adequate measures, including moving the concerned worker or granting a leave of absence, can be adopted under Directive 92/85/EEC "on the introduction of measures to encourage improvements in the safety and health at work of pregnant workers."

4. CONCLUSIONS

In conclusion, the problem presently concerning the health surveillance of workers exposed to electromagnetic fields (EMF) is that sound scientific data, especially on groups at higher risk, are insufficient and do not give adequate support to occupational physicians to face the problem; accordingly, no consensus exists regarding adequate implementation procedures. The development of shared criteria for health surveillance of EMF exposed workers, medical examinations in case of overexposures, and the definition, approach, and management of the problem of "workers at particular risk" is an evident and urgent need in this field.

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