Electromagnetic hypersensitivity and occupational exposure to electromagnetic fields (EMF)

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BBEMG and the University of Liège

- Unit of Psychoneuroendocrinology of the University of Liège
  - Professor Gabrielle Scantamburlo
  - Professor Marc Ansseau

- Declaration of interest
  Isabelle Demaret is a researcher in the unit and works for the Belgian BioElectroMagnetics Group (BBEMG).
  ELIA (a Belgian Electrical company) funds the BBEMG composed of researchers from three universities (Liège, Gent, Brussels) and a federal health research institute (Brussels). Researchers are employed by the universities and the universities have a contract with ELIA that guarantees researchers' scientific freedom.
First complaints in scientific literature about hypersensitivity to electromagnetic fields (EMF)

- At least since the early 80's
- First related to video display terminals
- Epidemic in Sweden
- No evidence of physiological causes (Liden, 1996)

More heterogeneous complaints now
Example: Questions received between 07/2013 and 03/2014

<table>
<thead>
<tr>
<th>Spontaneous contacts</th>
<th>23 100%</th>
</tr>
</thead>
<tbody>
<tr>
<td>- via email</td>
<td>16 70%</td>
</tr>
<tr>
<td>- via phone</td>
<td>7 30%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Electrosensitivity</th>
<th>20 87%</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Say he/she has symptoms linked to EMF or hypersensitivity</td>
<td></td>
</tr>
<tr>
<td>- No information</td>
<td>2 9%</td>
</tr>
<tr>
<td>- No, only question about potential effect on health</td>
<td>1 4%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Origins of symptoms</th>
<th>8 35%</th>
</tr>
</thead>
<tbody>
<tr>
<td>- EMF in general (&quot;les ondes&quot;, &quot;electromagnetic fields&quot;)</td>
<td></td>
</tr>
<tr>
<td>- Mobile phone</td>
<td>5 22%</td>
</tr>
<tr>
<td>- Mobile phone mast</td>
<td>5 22%</td>
</tr>
<tr>
<td>- WIFI</td>
<td>5 22%</td>
</tr>
<tr>
<td>- Computer</td>
<td>5 22%</td>
</tr>
<tr>
<td>- 50 Hz</td>
<td>3 13%</td>
</tr>
<tr>
<td>- TV (flat screen)</td>
<td>2 9%</td>
</tr>
<tr>
<td>- Overhead power line</td>
<td>2 9%</td>
</tr>
<tr>
<td>- Neuroweapons</td>
<td>1 4%</td>
</tr>
</tbody>
</table>
World Health Organisation reactions

- Complaints were frequent enough to alert WHO
- Reviews of studies but no physiological causes or evidence: “scientific evidence does not support a link between these symptoms and exposure to electromagnetic fields” (WHO 2005-2014)
- Since 1996, WHO defined hypersensitivity to EMF as
  
  Idiopathic Environmental Intolerance attributed to ElectroMagnetic Fields (IEI-EMF)

- No change in the definition since 1996

Idiopathic Environmental Intolerance to ElectroMagnetic Fields (IEI-EMF)

- Characteristics
  - a variety of non-specific symptoms
  - differ from individual to individual
  - symptoms are real
  - no medical diagnostic

- Treatment is difficult
  - Cognitive behavioural therapy can reduce:
    - subjective suffering
    - severity of symptoms
    - number of persons saying that they are hypersensitive
      (Rubin et al., 2006)
Functional somatic syndromes

- IEI-EMF is classified among the functional somatic syndromes (Barsky et al., 1999)

- As other syndromes with no physiological basis
  - irritable bowel syndrome
  - globus syndrome ("lump in one's throat"),
  - multiple chemical sensitivity (hypersensitivity to chemicals)

- In these syndromes
  - symptoms are non specific and common in general population
  - heterogeneous
  - symptoms and pains are real
  - can be invalidating and prevent some persons of going to work.

- In general population
  - 26% have at least one functional somatic symptom (Kingma et al., 2013)

From functional somatic symptoms to syndrome

- Stress and anxiety
- Prone to somatic symptoms
- Somatic symptom(s)
- Functional somatic syndrome IEI-EMF
- Fear of EMF
- Media: danger of EMF and hypersensitivity
- Proximity, invisibility and uncertainty of EMF
IEI-EMF and work

- Fear of EMF at home but also at work

- Attribution of health complaints to environmental factors
  - if more fatigue after work and difficulties to recover
  - more if lower satisfaction at work (Osterberg et al., 2007)

- Health complaints and video terminal display
  - more if lack of social support at work (Eriksson et al., 1997)

Directive 2013/35/EU and IEI-EMF

- Can the new directive increase fears of workers with IEI-EMF?
  - shows less severity than in 2004
  - does not cover long-term effects
  - temporary overexposures are allowed

- But
  - information on overexposure has to be given to workers
  - appropriate medical examination must be provided if undesirable health effects are reported
Example of the consequences of overexposure
(Moen et al., 2013)

- Accidental exposure to EMF from a radar on a Norwegian naval ship
  - an American destroyer passed at 100 m with radar turned ON (by mistake)
  - 7 members of the crew standing outside had heat sensations (face and arm)
  - electronic instruments were disturbed (fire alarm started)

- Official reaction
  - no formal communication, medical examination by inexperienced physician

- Reaction of the crew
  - members of the crew were anxious and developed different symptoms
  - 6 months later 22 persons were examined:
    - all in very good physical and mental health (better than general population)
    - health problems disappeared after examination by experienced physicians

Guidelines when overexposure

- Guidelines from the US navy concerning overexposure to radiofrequency (radars) (Moen et al., 2013)
  - Quick intervention among exposed personnel
  - Confirmation of the exposure
  - Medical examination to verify presence or lack of effects from heating (by experienced physician)
  - Reassurance to reduce anxiety
  - Information about high risk of anxiety and somatisation after such incident

=> quick reaction and information
Thank you for your attention