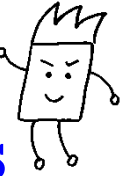


いわゆる電磁場過敏症の現状

福島県立医大神経内科
宇川義一

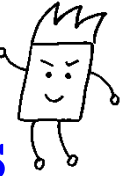




Hypersensitivity to EMF, Mobile phone related symptoms

EHSとは

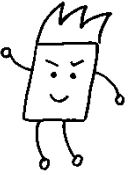
最近の総説での提言



Hypersensitivity to EMF, Mobile phone related symptoms

EHSとは

最近の総説での提言

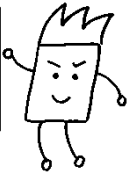


電磁過敏症とは

自ら電磁過敏症と思われる方々とそれ以外の方々を比較検討
過敏症の群がいくつかの点で影響を受けやすかったという先行研究

定義が自分自身の申告によるとなっているため、集団の統一性がなく、結論を出しにくい

Electromagnetic hypersensitivity (EHS)でなく
Idiopathic environmental intolerance attributed to EMF (IEI-EMF)
を使用するように



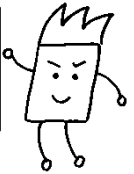
Background:

Idiopathic environmental intolerance attributed to electromagnetic fields (IEI-EMF) remains a complex and unclear phenomenon, often characterized by the report of **various, non-specific physical symptoms (NSPS) when an EMF source is present or perceived by the individual**. The lack of validated criteria for defining and assessing IEI-EMF affects the quality of the relevant research, hindering not only the comparison or integration of study findings, but also the identification and management of patients by health care providers. The objective of this review was **to evaluate and summarize the criteria** that previous studies employed to identify IEI-EMF participants.

Methods:

An extensive literature search was performed for studies published up to June 2011. We searched EMBASE, Medline, Psycinfo, Scopus and Web of Science. Additionally, citation analyses were performed for key papers, reference sections of relevant papers were searched, conference proceedings were examined and a literature database held by the Mobile Phones Research Unit of King's College London was reviewed.

Idiopathic environmental intolerance attributed to EMF (IEI-EMF)



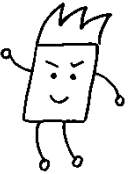
Results:

Sixty-three studies were included. “**Hypersensitivity to EMF**” was the most frequently used descriptive term. Despite heterogeneity, the criteria predominantly used to identify IEI-EMF individuals were: **1. Self-report of being (hyper)sensitive to EMF. 2. Attribution of NSPS to at least one EMF source. 3. Absence of medical or psychiatric/ psychological disorder capable of accounting for these symptoms 4. Symptoms should occur soon (up to 24 hours) after the individual perceives an exposure source or exposed area.**

(Hyper)sensitivity to EMF was either generalized (attribution to various EMF sources) or source-specific. Experimental studies used a larger number of criteria than those of observational design and performed more frequently a medical examination or interview as prerequisite for inclusion.

Conclusions:

Considerable heterogeneity exists in the criteria used by the researchers to identify IEI-EMF, due to explicit differences in their conceptual frameworks. Further work is required to produce consensus criteria not only for research purposes but also for use in clinical practice. This could be achieved by **the development of an international protocol** enabling a clearly defined case definition for IEI-EMF and a validated screening tool, with active involvement of medical practitioners.



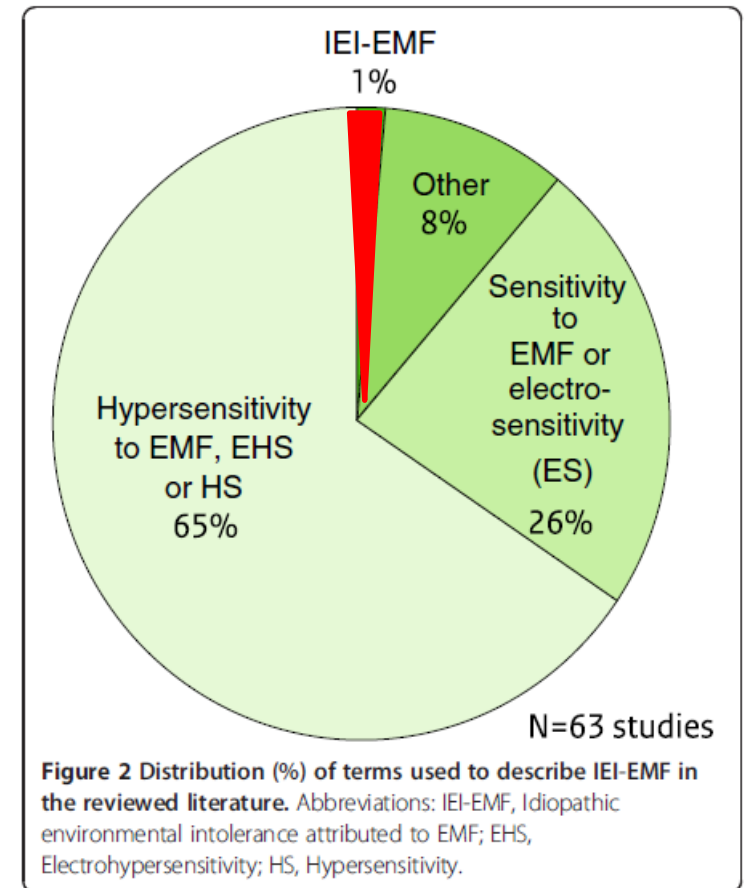
定義がはっきりしないので、発生率の統計がばらばら
スウェーデン1.5%, オーストリア3.5%, スイス5%, 台湾13.4%
レビューが今までないので、今回レビューを試みた

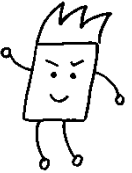
Table 1 Key search terms

| | |
|------------------------|--|
| Sensitivity: | Electrosensitivity, Electromagnetic hypersensitivity, Electrical sensitivity, Electromagnetic sensitivity, Electric hypersensitivity, IEI-EMF, Environmental intolerance, environmental illness. |
| Exposure: | EMF, ELF, Electromagnetic field(s), Electromagnetic exposure, mobile telephones, mobile phone(s), Base stations, Powerlines, Celltowers, Antenna(e), UMTS, GSM, DECT, VDU, cell phones. |
| Health Outcome: | Symptom(s), well-being, attributed symptoms, headache, fatigue. |
| Time period | From inception – 2011. |

上のキーワードで論文を選択

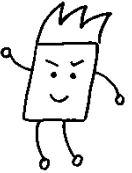
1%の論文でしか、**IEI-EMF**という
タームを使っていない。





- 1 Self-report of being (hyper)sensitive to EMF.**
自分自身の申告による
- 2 Attribution of NSPS to at least one EMF source.**
何らかの電磁場により起きていると考えている
- 3 Absence of medical or psychiatric/ psychological disorder capable of accounting for these symptoms**
他の原因が特定できない
- 4 Symptoms should occur soon (up to 24 hours) after the individual perceives an exposure source or exposed area.**
暴露からすぐに(24時間以内)症状が出る

ほとんどが自己申告により、客観的な検査所見はない

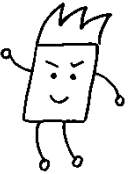


Subgroup に分けられるかもしれない、以下の問題点あり

器質的疾患は除外されるか
不安神経症など
短時間効果と長時間効果を一緒に扱って良いか
電磁場全体に症状を出す人と特定の起源からだけの人を一緒にして良いか

It is a challenge how all the different case definition parameters for IEI-EMF can be concisely embodied in **one international operational tool** which could be used in research and clinical practice, and how this instrument could be adjusted to the possible cultural differences (e.g. in terms of wording/phrasing questions on health outcomes).

この定義が多いので、色々な状態が含まれる
だから、国際的基準が必要



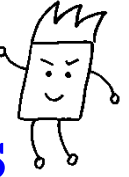
彼らは、以下の二つのステップを提唱している

In the first phase, a **case definition and case selection tool** should be developed, taking into account sources such as the published literature, expert opinions (e.g. based on a Delphi procedure [93]) and information on IEI-EMF patient characteristics from available datasets/ ongoing research.

まず今までのデータを元に**定義を作る**。しかし、暴露実験などはせずとにかく経過を見る事をする。実際に使用して、なるべく短い、使いやすいものを作成していく。

In the second phase, the case definition tool **should be validated** in terms of practical usability and the ability to differentiate between subgroups of IEI-EMF and patients with other conditions (e.g. chronic fatigue) who report similar symptoms.

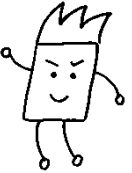
第二段階として、それを使用して他の病気で同じような症状を出す患者と区別できるかの**検証する**。



Hypersensitivity to EMF, Mobile phone related symptoms

EHSとは

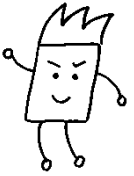
最近の総説での提言



最初に述べた定義に関する提案

Conclusions:

Considerable heterogeneity exists in the criteria used by the researchers to identify IEI-EMF, due to explicit differences in their conceptual frameworks. Further work is required to produce consensus criteria not only for research purposes but also for use in clinical practice. This could be achieved by **the development of an international protocol** enabling a clearly defined case definition for IEI-EMF and a validated screening tool, with active involvement of medical practitioners.



Fact であると言う主張

Some scientists and clinicians acknowledge the phenomenon of hypersensitivity to EMR resulting from common exposures such as wireless systems and electrical devices in the home or workplace; others suggest that electromagnetic hypersensitivity (EHS) is psychosomatic or fictitious.

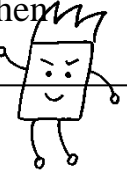
一応レビューをしているが、ポジティブな所見ばかり強調していて、すでに証明されているとしてるが、説得力に欠ける。

対策が述べられている

- (a) Avoid environmental triggers
- (b) Remediate nutritional and biochemical status
- (c) Reduce the toxicant burden

Conclusion: Recent evidence in the scientific literature suggests that various objective physiological alterations are apparent in some EHS persons claiming to suffer after exposure to certain frequencies of EMR (McCarty et al., 2011; Havas et al., 2010). As a result, many scientists now recognize that hypersensitivity to EMR can be a debilitating medical condition that is affecting increasing numbers of people throughout the world.

以上の結論を述べているが、根拠がはっきりしない



客観的に証明出来ない言う主張

Idiopathic environmental intolerance attributed to electromagnetic fields (IEI-EMF)

Double-blind experiments have found no association between the presence of EMF and self-reported outcomes in people with IEI-EMF.

In this article, **we conducted a systematic review of blind or double-blind provocation studies** in order to determine whether exposure to EMF causes changes in any objectively measured endpoints among people who attribute symptoms to EMF.

At present, there is no reliable evidence to suggest that people with IEI-EMF experience unusual physiological reactions as a result of exposure to EMF. This supports suggestions that EMF is not the main cause of their ill health.

This review found no reliable and consistent evidence to suggest that people with IEI-EMF experience any unusual physiological reactions as a result of exposure to EMF.

解釈として

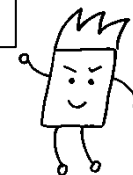
本当に電磁場と症状は関係ない

短期的曝露では再現出来ない

サンプル数が足りない

すぐに症状が出る人を検査

ポジティブな報告も同じ位のサンプル数



35歳の女医さんがEHSと考えた。この一例に関して、曝露実験をした。
曝露のオンオフを正確に判定できた。

TABLE 2. Sequence and characteristics of experiments

| Experiment | Electric field | | Trial | | Response |
|------------|----------------|---------------|----------------|----------|----------|
| | Condition | No. of trials | Duration (sec) | | |
| 1 | Pulsed | 10 | 100 | Symptoms | |
| | Sham | 10 | 100 | | |
| 2 | Pulsed | 5 | 100 | Symptoms | |
| | Continuous | 5 | 100 | | |
| | Sham | 5 | 100 | | |
| 3 | Pulsed | 300 | 1 | Behavior | |
| | Sham | 150 | 1 | | |

The assumption is particularly inapplicable to EMF hypersensitivity because intrasubject and inter-subject variabilities are its salient features

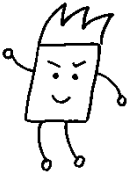
もともとバラバラなので、曝露実験が一定しなくても良いとしている

Letter to the Editor: Electromagnetic Hypersensitivity International Journal of Neuroscience, 122, 401, 2012

In conclusion, while the results of McCarty et al. are intriguing, **more research is necessary** before we should revise the conclusions of the recent systematic review which considered all controlled trials in this literature and failed to find sufficient evidence to support the concept of “electromagnetic hypersensitivity”

Electromagnetic hypersensitivity syndrome revisited again. International Journal of Neuroscience, 2013; 123(8): 593–594

Identification of a case-definition/case-selection tool for subjects with EHS could then be used in connection with test results to permit clinical diagnosis of subjects with EHS.



結局現時点では
すべてが納得出来る結論は出ていない
どちらの主張も決定的な証拠はない

疾患の可能性がないと言い切ることは無理
有意差が少ない有意差を出す事は、非常に
多い対象でないと結論だせない