

New developments in 2013

Submitted by Iris Atzmon

1) Radiofrequency, sperm and oxidative damage: the British Columbia's CDC and the Bioinitiative reports arrive to similar findings

The BCCDC published their report in March 2013. The authors found that "unlike the mixed findings found in occupational health studies of radar EMF exposures, the epidemiological studies of men assessed for infertility were consistent in demonstrating decreased sperm motility associated with increased use of mobile phones".

In contrast to all other formal authoritative reviews so far, the authors of the BCCDC report recognize the non thermal effect from non ionizing radiation, they even related to mechanism: "apart from the known thermal effects of RF, oxidative stress due to increased reactive oxygen species (ROS) or decreased antioxidants is a plausible explanation for non thermal effects of RF on sperm cells".

Moreover, the BCCDC report authors stated that "although RF [radiofrequency radiation] does not appear to have sufficient energy to damage DNA directly (as ionizing radiation may), other mechanisms of damage to DNA may be involved such as through ROS and oxidative stress, as well as up-regulation on gene expression and protein formation, including heat shock and adhesion proteins".

http://www.bccdc.ca/NR/rdonlyres/9AE4404B-67FF-411E-81B1-4DB75846BF2F/0/RadiofrequencyToolkit_v4_06132013.pdf

<http://www.bccdc.ca/healthenv/ElectromagFields/RadioFrequency/default.htm>

The Bioinitiative report presented evidence for damage to sperm and reproduction from several international laboratories, showing replications of sperm damage from cell phones when putting them on the belt, pocket or close to the testes.

According to the Bioinitiative report, human sperm are damaged by cell phone radiation at very low intensities (0.00034 – 0.07 $\mu\text{W}/\text{cm}^2$) on the basis of the available research.

Similarly to the BCCDC, the Bioinitiative group related to oxidative damage: "Animal studies have demonstrated oxidative and DNA damage, pathological changes in the testes of animals, decreased sperm motility and viability, and other measures of deleterious damage to the male germ line"

The full information is in chapter 18 of the Bioinitiative report.

http://www.bioinitiative.org/report/wp-content/uploads/pdfs/sec18_2012_Exposure_Effects_Fertility_Reproduction.pdf

http://www.bioinitiative.org/report/wp-content/uploads/pdfs/sec01_2012_summary_for_public.pdf

2) New Information about Mechanism:

Author Martin Pall PhD writes:

One of the great puzzles about the action of electromagnetic fields is how can they influence the biology of our bodies? The reason that this is such a great puzzle is that these fields are comprised of low energy photons, with energies too low to influence the chemistry of our bodies. So how can they possibly influence our biology? Many have argued that the only thing that they can possibly do is to heat things, and yet it is very clear that levels of exposure that produce only the slightest heating have been repeatedly shown to produce substantial biological effects. Now this puzzle has been solved in a paper with the title of this email, published on line in the Journal of Cellular and Molecular Medicine, freely available on the publisher's web site:

<http://onlinelibrary.wiley.com/doi/10.1111/jcmm.12088/pdf>

That paper reviews 24 different studies in which EMF exposures produce biological effects that can be blocked by using calcium channel blockers, drugs that block the action of voltage-gated calcium channels (VGCCs). Most of these drug studies implicated L-type VGCCs, showing blockage by channel blockers specific for these L-type VGCCs; however three other classes of the voltage gated calcium channels were also implicated in some of these studies. What these and other studies show, is that EMF exposures act by partially depolarizing the electrical charge across the plasma membrane of cells, activating the VGCCs and it is the increased intracellular calcium levels that are responsible for the reaction to EMF exposure. These 24 studies implicate the VGCCs in responses to a variety of EMFs, including extremely low frequency EMFs such as 50 and 60 cycle fields produced by our alternating currents in our wiring, various microwave/radiofrequency EMFs and nanosecond electrical pulses. Static electrical fields also act via VGCCs, not surprisingly because they also influence the electrical charge across plasma membranes.

Perhaps more surprisingly, static magnetic fields also act via VGCCs. This is a bit surprising because static magnetic fields do not produce electrical changes in static objects. However as pointed out in the paper, living cells in the body are rarely static, often moving rapidly in such phenomena as cellular ruffling.

Having resolved this long-standing puzzle, the paper goes on to consider how VGCC activation can produce two well-documented responses to EMF exposure: stimulating of bone growth and the production of single stranded DNA breaks in EMF-exposed cells. EMF exposures have repeatedly been shown to produce increases in nitric oxide levels, in some cases almost instantaneously. These nitric oxide increases are produced through calcium stimulation of the action of the two nitric oxide synthases in the cell, iNOS and eNOS, which are both calcium-dependent enzymes. Nitric oxide in the cell, acts to produce most physiological effects, by stimulating the

production of cycle GMP which stimulates, in turn the G-kinase (this is known as the NO/sGC/cGMP/G-kinase pathway). Most pathophysiological responses to nitric oxide to through another pathway, where nitric oxide acts as a precursor of peroxynitrite, a potent oxidant and reactive free radical precursor. The paper suggests that the EMF stimulation of bone growth, a very promising therapeutic response, goes through the first pathway. It also suggests that induction of single strand breaks in cellular DNA goes through the second pathway. It is possible that possible beneficial effects of EMFs go through the first pathway and adverse, pathophysiological effects go through the second pathway. Clearly we will need a lot of study to test mechanisms of EMF action.

This paper may be viewed in a practical setting as being very important in two ways:

1. There have been many claims that biological effects of EMF exposures cannot possibly exist because no plausible mechanism of action of such exposures could produce such effects. Clearly these claims are now defunct.
2. In studies aimed at understanding the mechanisms of action of EMF exposures we now know where to look. Such studies need to look at roles of VGCCs, intracellular calcium, nitric oxide and possibly cycle GMP or peroxynitrite. It can be argued, therefore, that this paper is very much a game changer, changing a situation where there has been substantial confusion, into one where, specific, targeted questions can be asked and answered experimentally.

Finally, this paper says nothing at all about EMF hypersensitivity (often abbreviated EHS), a condition where previous EMF exposure appears to induce high level sensitivity to some types of EMFs. EHS is similar to multiple chemical sensitivity (MCS), where previous chemical exposures produce high level chemical sensitivity. Chemicals act in MCS by indirectly activating the NMDA receptors and NMDA receptors have many similarities in their properties to those of the L-type VGCCs. You should expect, therefore, a future paper on a detailed proposed mechanism for EHS, with both many similarities and some apparent mechanism of MCS as well as some differences.

You may forward this message as you wish.

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3) The first 4G study: LTE Cell Phone Radiation Affects Brain Activity in Cell Phone Users

New peer-reviewed research finds that 30 minutes' exposure to LTE cellphone radiation affects brain activity on both sides of the brain.

Brain images pre- and post-LTE exposure

PRLog (Press Release) - Sep. 23, 2013 - BERKELEY, Calif. -- The first study on the short-term effects of Long Term Evolution (LTE), the fourth generation cell phone technology, has been published online in the peer-reviewed journal, *Clinical*

Neurophysiology. (1)

In a controlled experiment, researchers exposed the right ear of 18 participants to LTE cellphone radiation for 30 minutes. The source of the radiation was 1 centimeter from the ear, and the absorbed amount of radiation in the brain was well within international (ICNIRP) cell phone legal limits. The researchers employed a double-blind, crossover, randomized and counter-balanced design to eliminate any possible study biases.

The resting state brain activity of each participant was measured by magnetic resonance imaging (fMRI) at two times -- after exposure to LTE microwave radiation, and after a sham exposure.

The results demonstrated that LTE exposure affected brain neural activity not only in the closer brain region but also in the remote region, including the left hemisphere of the brain. The study helps explain the underlying neural mechanism for the remote effects of microwave radiation in the brain.

In 2011, Dr. Nora Volkow, Director of the National Institute on Drug Abuse, published a similar study in the ***Journal of the American Medical Association*** that received worldwide news coverage. Dr. Volkow reported that a 50 minute exposure to CDMA, a second generation cell phone technology, increased brain activity in the region of the brain closest to the cell phone. (2)

The current study establishes that short-term exposure to LTE microwave radiation affects the users' brain activity. Although LTE is too new for the long-term health consequences to have been studied, we have considerable evidence that long-term cell phone use is associated with various health risks including increased risk of head and neck cancers, sperm damage, and reproductive health consequences for offspring (i.e., ADHD).

Cell phone users, especially pregnant women and children, should limit their cell phone use. Moreover, cell phone users should not keep their phones near their head, breasts or reproductive organs when using the phone or whenever the phone is turned on unless it is in airplane mode.

For more information about the health effects of cell phone radiation see my Electromagnetic Radiation Safety Web site at <http://www.saferemr.com/>.

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<http://www.prlog.org/12215083-lte-cell-phone-radiation-affects-brain-activity-in-cell-phone-users.html>

4) Case report: Breast Cancer and Cellular Phones

Volume 2013 (2013), Article ID 354682, 5 pages

<http://dx.doi.org/10.1155/2013/354682>

Case Report: Multifocal Breast Cancer in Young Women with Prolonged Contact between Their Breasts and Their Cellular Phones

Abstract

Breast cancer occurring in women under the age of 40 is uncommon in the absence of family history or genetic predisposition, and prompts the exploration of other possible exposures or environmental risks. We report a case series of four young women—ages from 21 to 39—with multifocal invasive breast cancer that raises the concern of a possible association with nonionizing radiation of electromagnetic field exposures from cellular phones. All patients regularly carried their smartphones directly against their breasts in their brassieres for up to 10 hours a day, for several years, and developed tumors in areas of their breasts immediately underlying the phones. All patients had no family history of breast cancer, tested negative for BRCA1 and BRCA2, and had no other known breast cancer risks. Their breast imaging is reviewed, showing clustering of multiple tumor foci in the breast directly under the area of phone contact. Pathology of all four cases shows striking similarity; all tumors are hormone-positive, low-intermediate grade, having an extensive intraductal component, and all tumors have near identical morphology. These cases raise awareness to the lack of safety data of prolonged direct contact with cellular phones.

5) XII International Congress of Anti Aging Medicine:

"The deterioration of the microbiota and excessive exposure to radiation of technological devices accelerate aging, warned the president of the Spanish Society of Anti-Aging and Longevity (SEMAL), Dr. José Márquez Serres, at the XII International Congress of Anti Aging Medicine, held in Madrid."

Source: "Un exceso de las radiaciones tecnológicas aceleran el envejecimiento" MADRID, 4 Oct. (EUROPA PRESS) - <http://www.europapress.es/salud/salud-bienestar/noticia-deterioro-microbiota-someterse-excesivamente-radiaciones-tecnologicas-aceleran-envejecimiento-20131004171409.html>

6) New report: "Wi-Fi – A Thalidomide in the Making. Who Cares?" By Barrie Trower

From the report: "The level of irradiation incident upon the women was stated, as from, five microwatts per centimetre squared. This level of irradiation may seem meaningless to a non-scientist; however, when I say that it is below what most schoolgirls will receive in a classroom of wi-fi transmitters, from the age of approximately five years upwards, this level becomes more meaningful. A distinction here must be made and a very important one: schoolgirls are not women. Schoolgirls are children and children are both neurologically and physiologically different from adults. A child's brain tissue / bone marrow has different electrical conductivity properties than adults due to the higher water content (this renders the Specific Absorption Rate obsolete). Children's absorption of microwave radiation can be ten times higher than adults. Permanent low-level microwave exposure can induce chronic nitrosative and oxidative 'stress' thence, damage the cellular mitochondria (mitochondropathy). This 'stress' can cause irreversible mitochondrial DNA damage (mitochondrial DNA is ten times more susceptible to oxidative and nitrosative 'stress' than the DNA in the cell nucleus). Mitochondrial DNA is irreparable due to its low histone protein content, therefore any damage (genetic or otherwise) can be transmitted to all successive generations through the maternal line. Hence, we are subjecting each successive female generation to harm."

7) French Health Agency Recommends Children and Vulnerable Groups Reduce Cell Phone Radiation Exposure

In a major public announcement today, the French Agency for Food, Environmental and Occupational Health warned the public to reduce their exposure to cell phone radiation.

PRLog (Press Release) - Oct. 15, 2013 - BERKELEY, Calif. -- The French Agency for Food, Environmental and Occupational Health, ANSES, announced today the results of a two-year review by an expert Working Group of the scientific research on the risks related to exposure to radiofrequency (RF) radiation.

"This update has not brought to light any proven health effect and does not result in any proposed new maximum exposure limits for the population. However, limited levels of evidence do point to different biological effects in humans or animals. In addition, some publications suggest a possible increased risk of brain tumour, over the long term, for heavy users of mobile phones. Given this information, and against a background of rapid development of technologies and practices, ANSES recommends limiting the population's exposure to radiofrequencies – in particular from mobile phones – especially for children and intensive users, and controlling the overall exposure that results from relay antennas."

“The findings of this expert appraisal are therefore consistent with the classification of radiofrequencies proposed by the World Health Organization’s International Agency for Research on Cancer (IARC) as "possibly carcinogenic" for heavy users of mobile phones.

In addition, the expert appraisal nevertheless shows, with limited levels of evidence, different biological effects in humans or animals, some of which had already been reported in 2009: these can affect sleep, male fertility or cognitive performance.”

Due to the health concerns raised by the expert Working Group, ANSES made the following recommendations:

"Therefore, to limit exposure to radiofrequencies, especially in the most vulnerable population groups, the Agency recommends:

- for intensive adult mobile phone users (in talk mode): use of hands-free kits and more generally, for all users, favouring the purchase of phones with the lowest SAR values;
- reducing the exposure of children by encouraging only moderate use of mobile phones;
- continuing to improve characterisation of population exposure in outdoor and indoor environments through the use of measurement campaigns;
- that the development of new mobile phone network infrastructures be subject to prior studies concerning the characterisation of exposures, and an in-depth study be conducted of the consequences of possibly multiplying the number of relay antennas in order to reduce levels of environmental exposure;
- documenting the conditions pertaining at those existing installations causing the highest exposure of the public and investigating in what measure these exposures can be reduced by technical means.
- that all common devices emitting electromagnetic fields intended for use near the body (DECT telephones, tablet computers, baby monitors, etc.) display the maximum level of exposure generated (SAR, for example), as is already the case for mobile phones."

The Agency further recommends that children’s exposure should be reduced “by encouraging only moderate use of mobile phones, ideally with hands-free kits and mobile terminals with the lowest SAR values.”

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<http://www.prlog.org/12226630-french-health-agency-recommends-children-and-vulnerable-groups-reduce-cell-phone-radiation-exposure.html>

The oncologist Dominique Belpomme : The worst is yet to come: Electrosensitive patients are only the tip of the iceberg

Google translation from French:

The oncologist Dominique Belpomme does not share the findings of the French Agency for Food, Environmental and Occupational Health on magnetic waves delivered on Tuesday morning. According to him, a prolonged mobile phone use exacerbates the risk of Alzheimer and brain cancer.

French Safety Authority issued its report on Tuesday morning on the subject of magnetic waves. The Agency estimates that exposure to electromagnetic waves - mobile phones - can cause biological changes in the body, but that the available scientific evidence does not show any proven effect on health.

Dominique Belpomme, he does not beat around the bush. " Internationally, there is a strong and not called into question by scientists working independently idea electromagnetic fields are harmful to health," explains oncologist member ARTAC (Research Association therapeutic anti - cancerous) .

" The magnetic fields are harmful to health " (Dominique Belpomme)

According to him, the report of the French Safety Authority is worthless

"The studies are not contradictory : some are scientifically valid and others are not," he said in a non- veiled attack on the National Safety Authority. " The tragedy today is that we are with the various reports of Franco- French agencies , and we are in a pattern that is not validated in the international scientific ."

"These reports will anyway to enrich the dustbin of history. They have no interest since the first report of the National Safety Authority just said that there was no risk " (Dominique Belpomme)

In a report in 2009, the French Safety Authority asserted, in effect making a synthesis of 226 studies. Inside, 45 % said that the waves had biological effects , 55 % said no.

Dominique Belpomme completely rejects the thesis that there are no proven effect on health. " We know that when used electromagnetic fields to generate prolonged and intensive way of Alzheimer disease in the elderly but also young subjects, including among some teens ," he says . Before moving on brain cancer : "This is the Interphone study that says if you are under 20 years old and you use a cell phone an hour a day for 5 to 10 years, you have a five -fold increased risk of brain tumor . "

The Interphone study on mobile phone use and risk of brain cancer " We, citizens , we will have a bill to pay , but also a humanitarian financial invoice " (Dominique Belpomme)

Electro- sensitive , a "real disease "

For the scientist , it is high time that the government is tackling the problem . " We are facing a real public health problem by the fact that it will one day be globalized as other U.S. citizens we have a bill to pay the company a financial bill but also a humanitarian bill ."

Dominique Belpomme puts particular emphasis on an important point: the electro-sensitive . According to him, it is indeed a disease, contrary to what some may say . "This is real sick with goals that say tests ," he says . And he announced that the worst is yet to come: " These patients are only the tip of the iceberg ."

http://www.robindestoits.org/Belpomme-Les-champs-electromagnetiques-sont-nefastes-pour-la-sante-France-Info-15-10-2013_a2067.html

Professor Belpomme severely critical of the last report on electromagnetic fields ANSES - The Republican Lorrain - 15/10/2013

Professor Dominique Belpomme cancer is the guest of honor at the Organic Fair Gorcy held this weekend.

The 18th International Fair of Organic Gorcy held Saturday 19 (12 am to 20 pm) and Sunday, October 20 (10 am to 18 pm). It will host 120 exhibitors from France and Europe (wine , vegetables, essential oils etc...). More than 3,500 people are expected in this fair reference. Program: many events, shows, exhibitions and conferences, including those of Dominique Belpomme, the guest of honor. The latter is a professor of oncology at the University Paris V and Director of the European Institute for Research on Cancer and the Environment (ECERI) in Brussels. He will talk about food and pesticides, but also the dangers of electromagnetic fields , one of his specialties.

You violently criticize the findings of the National Agency for the Safety of electromagnetic fields (see RL yesterday) .

Professor Dominique Belpomme: "This is a political statement without any scientific value, good to throw in the trash. Many experts who composed the commission told me that their views had not been taken into account in the conclusions. Others with no knowledge of the subject, and no international recognition. These findings go against the World Health Organization (WHO), some of whom have yet confessed being pressured by phone operators to minimize the hazards. In the end it will be a Franco- French opinion which does not exceed our borders, but with disastrous consequences for us, with the population. "

How do you see this report?

"Those responsible for the ANSES were introduced by politicians. They obey them. But policies are interfaces telephony operators. They do not consider the health bill, he will have to pay us. And it will be heavy. This applies to other areas such as pesticides. I fought against the use of chlordecone in Martinique, which now has the world record in the number of prostate cancers . We just changed pesticide there, but

not our ways. We are no longer in a democratic country. The single thought, which passed before any employment growth, industrial reign."

Pollutants are everywhere?

"Yes, it is irreversible when they entered the body. There is an explosion of cancer, autism, Alzheimer's (and international studies linking electromagnetic waves) , allergies, diabetes in France. And as for asbestos, it will take time to respond, so that pollutants are more dangerous."

Hope?

"It is called Call of Paris , I started with 3,000 international scientists, which aims to recognize the use of pollutants as a crime against humanity. And moving in the right direction. "

Interview with Sébastien Bonetti .

<http://www.republicain-lorrain.fr/meurthe-et-moselle/2013/10/17/foire-bio-de-gorcy-en-lutte-contre-le-cancer>

8) New paper: Case-control study of the association between malignant brain tumors diagnosed between 2007 and 2009 and mobile and cordless phone use

- Authors: Lennart Hardell, Michael Carlberg, Fredrik Söderqvist, Kjell Hansson Mild
- Published online on: Tuesday, September 24, 2013
- Pages: 0-0
- DOI: 10.3892/ijo.2013.2111

Abstract

Previous studies have shown a consistent association between long-term use of mobile and cordless phones and glioma and acoustic neuroma, but not for meningioma. When used these phones emit radiofrequency electromagnetic fields (RF-EMFs) and the brain is the main target organ for the handheld phone. The International Agency for Research on Cancer (IARC) classified in May, 2011 RF-EMF as a group 2B, i.e. a 'possible' human carcinogen. The aim of this study was to further explore the relationship between especially long-term (>10 years) use of wireless phones and the development of malignant brain tumours. We conducted a new case-control study of brain tumour cases of both genders aged 18-75 years and diagnosed during 2007-2009. One population-based control matched on gender and age (within 5 years) was used to each case. Here, we report on malignant cases including all available controls. Exposures on e.g. use of mobile phones and cordless phones were assessed by a self-administered questionnaire. Unconditional logistic regression analysis was performed, adjusting for age, gender, year of diagnosis and socio-economic index using the whole control sample. Of the cases with a malignant

brain tumour, 87% (n=593) participated, and 85% (n=1,368) of controls in the whole study answered the questionnaire. The odds ratio (OR) for mobile phone use of the analogue type was 1.8, 95% confidence interval (CI)=1.04-3.3, increasing with >25 years of latency (time since first exposure) to an OR=3.3, 95% CI=1.6-6.9. Digital 2G mobile phone use rendered an OR=1.6, 95% CI=0.996-2.7, increasing with latency >15-20 years to an OR=2.1, 95% CI=1.2-3.6. The results for cordless phone use were OR=1.7, 95% CI=1.1-2.9, and, for latency of 15-20 years, the OR=2.1, 95% CI=1.2-3.8. Few participants had used a cordless phone for >20-25 years. Digital type of wireless phones (2G and 3G mobile phones, cordless phones) gave increased risk with latency >1-5 years, then a lower risk in the following latency groups, but again increasing risk with latency >15-20 years. Ipsilateral use resulted in a higher risk than contralateral mobile and cordless phone use. Higher ORs were calculated for tumours in the temporal and overlapping lobes. Using the meningioma cases in the same study as reference entity gave somewhat higher ORs indicating that the results were unlikely to be explained by recall or observational bias. This study confirmed previous results of an association between mobile and cordless phone use and malignant brain tumours. These findings provide support for the hypothesis that RF-EMFs play a role both in the initiation and promotion stages of carcinogenesis.

<http://www.spandidos-publications.com/10.3892/ijo.2013.2111>

9) New paper: Using the Hill viewpoints from 1965 for evaluating strengths of evidence of the risk for brain tumors associated with use of mobile and cordless phones

Lennart Hardell and Michael Carlberg

Abstract

Background: Wireless phones, i.e., mobile phones and cordless phones, emit radiofrequency electromagnetic fields (RF-EMF) when used. An increased risk of brain tumors is a major concern. The International Agency for Research on Cancer (IARC) at the World Health Organization (WHO) evaluated the carcinogenic effect to humans from RF-EMF in May 2011. It was concluded that RF-EMF is a group 2B, i.e., a “possible”, human carcinogen. Bradford Hill gave a presidential address at the British Royal Society of Medicine in 1965 on the association or causation that provides a helpful framework for evaluation of the brain tumor risk from RF-EMF.

Methods: All nine issues on causation according to Hill were evaluated. Regarding wireless phones, only studies with long-term use were included. In addition, laboratory studies and data on the incidence of brain tumors were considered.

Results: The criteria on strength, consistency, specificity, temporality, and biologic gradient for evidence of increased risk for glioma and acoustic neuroma were fulfilled. Additional evidence came from plausibility and analogy based on laboratory

studies. Regarding coherence, several studies show increasing incidence of brain tumors, especially in the most exposed area. Support for the experiment came from antioxidants that can alleviate the generation of reactive oxygen species involved in biologic effects, although a direct mechanism for brain tumor carcinogenesis has not been shown. In addition, the finding of no increased risk for brain tumors in subjects using the mobile phone only in a car with an external antenna is supportive evidence. Hill did not consider all the needed nine viewpoints to be essential requirements.

Conclusion: Based on the Hill criteria, glioma and acoustic neuroma should be considered to be caused by RF-EMF emissions from wireless phones and regarded as carcinogenic to humans, classifying it as group 1 according to the IARC classification. Current guidelines for exposure need to be urgently revised.

DOI 10.1515/reveh-2013-0006 Rev Environ Health 2013;

Hardell L Carlberg M. Reviews on Environmental Health