ELECTROMAGNETIC FIELDS DISEASE

(RADIOFREQUENCY RADIATION DISEASE)*

In Memoriam, Dr. William J. Rea

Dr. Carlos Sosa M.D.

Dr. Pedro Sierra M.D.

The toxic nature of electromagnetic fields (EMFs) comprising electrical voltages, radiofrequencies and microwaves is a clearly established fact in the international medical literature, that has accumulated over the last 250 years. There is a causal relationship between the exposure to EMFs and a broad spectrum of multisystemic diseases and dysfunctions that complies with the epidemiological postulates of medical causation of Koch-Henle, the Bradford Hill and Susser criteria. For several decades now, the explosion of wireless technologies has been creating a serious medical problem in which Electromagnetic Hypersensitivity (EHS) and Dysautonomia stand out because of their rising incidence. It's urgent that the medical profession becomes aware of the clinical and pathophysiological implications of the irradiation of the child with EMFs and the consequent deleterious effects on pediatric health, the gestational neurological alteration and the cognitive dysfunction during the school age.

I. INTRODUCTION

The medical and scientific history of the effects caused by the irradiation of the human being by EMFs, has a rich international bibliographical tradition of over two centuries (1, 2). The medical problem as such, is not new, and it was broadly studied by the Medicine of the Soviet Union and the socialist countries (3-6). The National Aeronautics and Space Administration (NASA) of the United States studied the problem deeply and demonstrated the intrinsic risk that the exposure of human beings to radiofrequencies and microwaves poses for health, as a fundamental resource for space communications and aeronautics (7-9).

Currently, in the face of the planetary irruption of wireless communication systems including cell phones, wireless internet (Wi-Fi), and smart meters as well as other sources of EMFs, the international alert among specialists in Environmental Medicine and Bioelectromagnetism is at its highest point. Journalistic reports and medical studies proliferate throughout the world concerning injured (25-28) or deceased patients (55) due to the irradiation from EMFs coming from cell phone antennas, Wi-Fi routers, cell phones, cordless telephones, computers, digital tablets, smart meters, radar, power lines, satellites,

*- Translated by the Green Bank (West Virginia, USA) collective of Electromagnetic Hypersensitivity patients for educational purposes only, 2020.

radio and electrical stations, etc. There are multiple and varied sources of electromagnetic pollution or electrosmog throughout the entire planet.

Fortunately, on May the 31st of 2011 the World Health Organization (WHO) through its official agency, the International Agency for Research on Cancer (IARC) with headquarters in Lyon, France, officially declared all radiofrequencies used by cell phone telephony and wireless internet as a type 2B carcinogen or possible carcinogen. The strepitous rise of the international incidence of cancer is congruent with this declaration, that has been openly fought by the physicists, engineers and ex-employees of the industry that make up the Electromagnetic Fields Project of the WHO and by the International Commission for Non-ionising Radiation Protection; this last one, is a self-appointed and self-elected creation of the German cell phone industry.

The official recognition of the existence of EHS as a medical diagnosis which is legitimate, real, logical, coherent, congruent, rational, consequent, clinical and truthful, which was made the governments of Germany, Sweden, United States, Israel, the Canadian Commission of Human Rights and the judicial systems of Spain, France, Australia and the official medical branch of the WHO, the IARC, constitutes a milestone in the medical-scientific history of mankind.

II. HISTORY

Humanity assumed *a priori* in the course of history that its close contact with electromagnetic phenomena was totally innocuous. However, the evidence to the contrary, both historical and medical, is overwhelming in number. This knowledge, the property of humanity, has been systematically concealed.

The first victim documented by the corresponding historiography, Johann Doppelmeyer, professor of mathematics in Nuremberg, wrote in 1744 the first treatise on electricity: "Neu-entdeckte Phaenomena von Bewunder-würdigen Würkungen der Natur" (Recently discovered phenomena on the wonderful functioning of nature). Doppelmeyer, referred to as the first electrical martyr, died of a cerebrovascular disease after one of many electrical experiments (2).

Benjamin Franklin, remembered for his experiments with kites with lightning rods, left established in his epistolary production what today corresponds to a chronic EMFs intoxication. References to dizziness, pain, headache, photopsias, tinnitus and dysesthesias abound in it (2).

In 1749 the British physician William Stukeley reported, after the March 8 earthquake of London, that many patients experienced "pain in their joints, rheumatism, headache, back pain, hysterical and nervous disorders …" *just as they had with electrification*; and for some this proved to be fatal. This was one of the first reports of the geopathies caused by the generation of EMFs during the displacement of tectonic layers during telluric events (2).

Jean Morin, a Physics professor at the Collège Royale of Chartres in France, wrote in 1748 "Nouvelle Dissertation sur l'Électricité" (A new dissertation on electricity) in which he described the deleterious effects of electrical charges: "I placed a big cat on my bed cover, I rubbed it and saw sparks flying in the darkness". He kept on rubbing it for over half an hour and wrote: "A thousand little fires flew here and there and by continuing the friction, the sparks increased until they resembled spheres or fireballs of the size of a hazelnut … I approached my eyes close to one fireball and I immediately felt an intense and painful sting in my eyes; there was no impact in the rest of my body, but the pain was followed by weakness which made me fall sideways, my strength failed and I struggled, so to speak, against the faint, I struggled against my own weakness, of which I did not recover for several minutes."(2)

The introduction of the telegraph in Europe and later on in the rest of the world during the XIX century, brought an illness known in France as the *mal télégraphique* which was only present in close proximity to the electrified cables used by the system. Originally described by Ernst Onimus around 1870, this illness was only manifested in the telegraph operators and in people who lived close to the distribution network. Patients presented with dizziness, insomnia, palpitations, visual problems and a tightness sensation like a claw in the occipital area. The patients referred symptoms of memory loss, tiredness and depression (2).

In 1869, George Miller Beard, a physician with a professional Neurology practice in New York city, described in the Boston Medical and Surgical Journal what seemed to be a new disease caused by stress. He called it *neurasthenia* (etymologically, lack of strength) and it was characterized by weakness, tiredness, nausea, vomiting, insomnia, irritability, dizziness, vasomotor disorders such as coldness and erythema, tremors, diaphoresis, dyspnea, palpitations, chest pain, paresthesia, polyuria, diarrhea, dysesthesia and arthralgias. Beard never linked it to exposure to electromagnetism, but it would be the German doctor Rudolf Arndt who would finally elucidate the relationship between neurasthenia and EMFs: "Even the weakest galvanic current, so weak that it hardly caused the deflection of a galvanometer needle and was not noticeable in the slightest by other people, annoyed them to the greatest degree". In 1885 he wrote that: "Electrosensitivity is a high-grade feature of neurasthenia"(2).

In 1897, Guglielmo Marconi occupied the westernmost tip of the Isle of Wight in the UK, where he erected a 12-story tower that would house the antenna for the world's first permanent radio station. Marconi, totally ignorant of the work of the director of the Laboratory of Biological Physics of the Collège de France in Paris, Dr. Jacques-Arsène d'Arsonval, who had elucidated an important part of the effects of high-frequency electricity, never suspected that the deterioration of his health from this exposure to non-ionizing radiation would affect his health for the rest of his life. Marconi suffered from fevers throughout his life, delusions and depression. Finally, between 1934 and 1937 he had nine acute myocardial infarctions. (2)

On February 24, 2011, the Italian Supreme Court upheld a conviction of criminal charges against Vatican Cardinal Roberto Tucci, president of the steering committee of Vatican

Radio. The accusation invoked harmful health effects due to the pollution of the environment with radio waves transmitting the Vatican's signal in 40 languages by means of 58 towers in an area of 1000 acres, surrounded by urban dwellings in an eminently residential sector of Rome. Since 1931 the inhabitants of the adjoining residential areas had been publicly complaining that the EMF irradiation they were suffering from the Vatican antennas was destroying their health and causing an epidemic of childhood leukemia. Between 1997 and 2003, children between the ages of 1 and 14 who lived within 6 to 12 kilometers of the area where the Vatican Radio antennas were located developed myelomas, leukemias and lymphomas with an incidence 8 times higher than the pediatric population outside this irradiation area (2).

In 2008, we revealed to the world a highly classified U.S. federal government document, known internationally in expert circles as the Glaser List (10). This document, although declassified in 1971, remained hidden from the eyes of the American public until the 21st century. Dr. Zorach Glaser documented for several decades the worldwide medical literature on the medical effects of radiofrequency and microwave EMFs. The Glaser list is an international milestone because it definitively disproved the supposed absence of evidence and medical studies on the harm caused by EMFs used by cellular telephony and wireless internet, a position held by the cellular telephone industry and by governments that, with full knowledge, allow the physical integrity of millions of children around the world to be jeopardized.

The Central Intelligence Agency (CIA) released in 2000 part of its secret files on the medical effects of EMFs, which showed that the U.S. federal government was in possession of and had translated the Soviet equivalent of the Glaser list, with over 7000 international medical studies on the subject (11). If Dr. Kholodov's bibliographic sources are analyzed in this study, it is easy to understand that the total number of international medical publications shows a geometric progression on the subject, a progression that persisted in subsequent years and continues to increase to the present day.

Before the creation of one of the first radiofrequency based wireless telephones (Altai) by Soviet engineer Leonid Kupriyanovich (12), the Soviet Union had clear medical evidence of the harm caused to humans by these EMFs. This is the reason why there are differences of an order of magnitude of 1000 times between the exposure standards to microwaves and radiofrequencies of the civilian population adopted by the Soviet Union and other socialist countries, and the American and European standards.

According to Dr. Olle Johansson (retired; previously heading The Experimental Dermatology Unit, Department of Neuroscience, The Karolinska Institute, Stockholm, Sweden) the allowed current EMF radiation levels for 3G on the planet are 10^{18} times higher, or more, than the near-corresponding natural radiation was before the generalized introduction of wireless technologies (14).

The great debate about the medical effects of EMFs has historically revolved around whether EMF exposure that produces temperature elevation in the human body is the only one that is harmful or, conversely, whether there are athermal effects that affect human health. This

artificial limit, introduced by the military industry without any prior *medical* study, maintains that as long as radiofrequencies or microwaves do not produce heat in the irradiated tissue, no harm is possible.

Medical studies not related to the industry (civilian and military) have demonstrated the presence of damage and physiological alterations at athermal levels (15,16). This great dichotomy between athermal levels (advocated by independent researchers) and thermal irradiation levels (generally advocated by physicists and engineers with very clear business or military ties) underlies the whole controversy. The vested interests of the industry are evident.

In 1932 Schliephake (17) rediscovered some of the fundamental components of what is known as EHS (Electromagnetic Hypersensitivity), electrosensitivity, microwave syndrome, radiofrequency disease, smart meter disease, environmental intolerance to EMFs, the Swedish disease (in honor of the sick engineers of Ericsson), membrane sensitivity syndrome, central sensitivity syndrome, radar technicians' disease, electromagnetic dysautonomia, electromagnetic disease, neurasthenia, telegraphers' illness, electromagnetic intoxication, asthenic syndrome, electrohypersensitivity, climate sensibility, radio wave disease, etc.

III. PATHOPHYSIOLOGY

The complex mechanisms of electromagnetic interaction governing the electrochemistry of cellular organelles, mitochondrial energy balance, the electron transport chain, ion channels, cell membrane physiology, translation, transcription and replication allow the dysfunctions of these to be expressed clinically in organs and tissues spanning the entire human body. It is no wonder that the normal electrochemistry of human cells is affected by the environmental changes of the planet's electromagnetic density, caused by artificial sources of microwaves and radiofrequencies.

It is extremely dangerous that private companies around the world are being allowed to experiment with the electromagnetic signals emitted by two vital organs whose nature is electrical *par excellence*, such as the human brain and heart.

Multiple mechanisms have been proposed to explain the damage produced in cells and tissues caused by their irradiation with electromagnetic sources of microwaves, radiofrequencies and voltage: increased reactive oxygen species, impaired mitochondrial function, impaired intracellular calcium homeostasis, impaired heat shock proteins, impaired neuronal gene expression, impaired cell proliferation, apoptosis, actin filament depolymerization, increased blood-brain barrier permeability, cell membrane proteins impairment, activation of the adenylate kinase pathway, increased acetylcholine, increased synthesis and activation of stress proteins, immune dysregulation, decreased melatonin synthesis, activation of peroxidation, deoxyribonucleic acid (DNA) oxidative damage changes in the activity of antioxidant enzymes, alterations of neurotransmitters, stimulation of central magnetosomes,

stimulation of electric force sensitive ion channels, and phosphorylation of protein kinases among others (10, 20 - 24, 50, 54).

The proinflammatory nature of non-natural EMFs, with all their complex ultrastructural mechanisms, is a source for creating a fertile breeding ground for various multisystemic clinical manifestations. Chronic inflammation has been associated for example, with cancer and neurodegenerative diseases. International medical studies conducted around cell phone antennas have shown an exceedingly high incidence and mortality due to cancer and serious neurological disorders in people living near them (23, 25 – 28).

Given the irradiation on the eyeball during each period of cell phone use, it is important to keep in mind that the appearance of cataracts is directly related to the deformation of the glutathione peroxidase molecule that protects the cellular proteins of the ocular lens and the lipids of the cell membranes from the oxidative stress generated by the EMFs (29, 30).

The Russian National Committee for Non-Ionizing Radiation Protection (RNCNIRP) has noted that the health risk of the child exposed to EMF is much higher than that of the adult because the absorption of electromagnetic energy is much greater in the child's head since the child's brain has a higher electrical conductivity, is smaller, has thinner cranial bones, there is a greater sensitivity of the body to EMFs than in the adult, the infant brain is still in a process of formation and development, and today's children are more exposed to EMFs (31). These EMFs decrease the indexes of voluntary attention and semantic memory, in addition to causing changes in the audio motor response. Cell phone use by children affects the brain and autonomic nervous system (48). By virtue of the Precautionary Principle, the official advice emanating from Public Health England states that "Excessive use of mobile phones by children should be discouraged."

IV. DIAGNOSIS AND CLINICAL PICTURE

EMFs disease or EHS is a syndromic diagnosis of exclusion, whose central axis is related to the appearance of interoceptive and exteroceptive signs and symptoms, with the exposure to electric and magnetic fields at various frequencies and intensities. The dysesthesia and dysautonomia component (32, 33) thereof is marked. The distances to the EMF irradiation source at which clinical manifestations occur range from centimeters to thousands of kilometers, just as happens in patients with hypersensitivity to the frequencies used in satellites, a widely known case by world specialists and scientific authorities in environmental medicine. This phenomenon of hypersensitivity to EMFs is due to the phosphorylation of protein kinases of afferent autonomic, spinal and peripheral sensitive nerves that causes an increase in sensitivity of approximately 1,000 times in the patient (52).

These clinical manifestations are mediated both centrally and peripherally and, very often, the patient's symptoms are referred to the nervous, cardiovascular, immune and endocrine systems, as pathophysiological amplification systems to electromagnetic and chemical pollution (50).

EHS is a non-linear and athermal phenomenon (34, 46) that occurs around the world even within, above and below international exposure standards of the civilian population to EMFs. The clinical picture is constant all over the planet and coincides with the historical manifestations of it.

The patient's clinical presentation is essential. He (or she) refers that he “cannot stand”, “does not resist” cell phone antennas, computers, neon lights, landlines, cell phones, electrical transformers, Wi-Fi and its routers, powerlines, cradle monitors, cordless phones, loose cables or electrical extensions, electronic tablets, washing machines, refrigerators, blenders, television sets, electric motors, printers, laptops, photocopiers, nuclear magnetic resonance scanners and countless devices and gadgets that operate on electric voltage, microwaves, radiofrequencies or magnetic fields. Also, some patients have intolerance to specific colors within the electromagnetic spectrum that reaches the point of causing allergic reactions and loss of consciousness. An extremely helpful measure in the patient who manifests intolerance to EMFs is to ask if he has a cell phone or wireless internet antennas (signal amplifier) in the vicinity of the place of residence or at school, or if he has a Wi-Fi router at home.

A significant percentage of patients with EHS have a history of exposure or poisoning by pesticides or agrochemicals. Many of them come to the consultation with a diagnosis of multiple chemical sensitivity that, over time, transforms into EHS (35) or is added to the previous diagnosis.

The autonomic nervous system is particularly sensitive to radiofrequencies and microwaves. More than ninety percent (90%) of patients with environmental diseases of electromagnetic and/or chemical origin have objective alterations of the autonomic nervous system with clear multisystem compromise resulting from the dysautonomia (50). Currently, there's a great worldwide explosion of cases of dysautonomia, a phenomenon that was quite rare or scarce before 1983, when cell phone telephony began in the United States. It is important to check the hemodynamic parameters by means of the tilt test in the pertinent cases.

The phenomenon of involvement of neurotransmitters in the central nervous system (CNS) at very low levels of exposure to electromagnetic fields(54) requires a well-performed mental examination since the concomitant diagnoses of depression, anxiety, panic disorders and other psychiatric pathologies is common.

It is crucial at the time of making the diagnosis to measure the levels of heavy metals in blood, urine, hair and nails when appropriate. The following should be measured: aluminum, antimony, arsenic, beryllium, bismuth, cadmium, lead, mercury, platinum, thallium, thorium, uranium, nickel, silver, tin and titanium (among others, according to the clinical presentations).

Allergy immunological tests are essential. It should be borne in mind that in industrialized societies, normal cellular homeostasis is threatened by about five million (5,000,000) chemical compounds that have been synthesized in the world (51). In addition, thousands of new chemical compounds in the world are being introduced annually for consumption, as well as for grooming, food preservation, beauty, textile coloring, etc., which have a direct

impact on the presentation of multiple chemical sensitivity and that of its sister, EHS. According to the patient's clinical picture, the following should be measured and ordered:

- Bronchial inhalation challenge to measure phenol, formaldehyde, ethanol, chlorine and insecticides, with monitoring of vital signs and cognitive function.
- Heart variability test in order to evaluate the functioning of the sympathetic and parasympathetic systems
- Pupillography
- Thermography
- Single photon emission computed tomography (SPECT), in order to evaluate cerebral perfusion with radionuclide markers
- Allergy skin tests
- Incitant testing to measure substances that can, under certain circumstances, stimulate the production of antibodies, histamine and serotonin (as EMFs)
- Inhalant testing (dust, mites, fungi, pollen, molds and scales)
- Food allergy testing
- Chemical allergy tests, in addition to the aforementioned substances, parfums, cigarette smoke and diesel fuel should be measured
- Hormones
- Intestinal peptides
- Viruses and bacteria
- Intradermal testing
- Sublingual provocation neutralization
- Ultrasound of brain blood flow

Diagnostic images of the CNS are necessary, not only in their computed versions of nuclear magnetic resonance (if the patient tolerates it) and X-rays, but also the images of cerebral metabolic activity (SPECT) because due to the decrease in blood flow (22), the cerebral metabolism is noticeably reduced in patients with EHS.

Some common clinical manifestations of the patient attending the consultation are headache, dizziness, nausea, vomiting, insomnia, dyspnea, anxiety, diaphoresis, irritability, amnesia, hypoprosexia, dysarthria, disorientation, unsteady gait, hypotension or hypertension (depending on the phase in which it is in and the time of exposure), myalgias, arthralgias, weakness, malaise, asthenia, adynamia, tinnitus, photopsia, convulsions, tremors, vertigo, mental confusion, tachycardia or bradycardia, palpitations, erythema, motor restlessness, dysesthesias, edema, syncope and cardiac arrhythmias. These symptoms worsen up when the patient is exposed to EMFs and decrease (in number and intensity) when moving away from the sources of emission.

One should bear in mind that, due to the involvement of all organs and tissues by EMFs, the symptoms and signs may be related to any organic system (35).

It is noteworthy that the involvement of the autonomic nervous system triggers a number of early warning signs and symptoms that include coldness in hands and feet, the presence of livedo reticularis, fatigue, anxiety, motor restlessness and insomnia (50).

V. EPIDEMIOLOGY

The worldwide incidence of patients with EHS, coronary heart disease, cancer, diabetes, obesity, neurodegenerative diseases and depression has been on the rise since the beginning of the twentieth century, when the United States began the great national electrification program of the 50 states of the American Union (2, 37-39). Although at first the cases of EHS that were aired in the medical literature and the world press were scarce (for example, the EHS with acoustic and visual hypersensitivity of the father of electrical engineering, Nikola Tesla), currently every day a report of a person affected by EMFs intolerance is published in the world.

Concurrently, these patients have their lives destroyed because on many occasions they cannot work or live in society due to the severe neurological and cardiovascular dysfunctions (among others) that they present due to the exposure to cell phones, Wi-Fi routers, neon lights, computers, tablets, cell phone telephony antennas, household appliances, etc.

The global prevalence of EHS has exhibited variable numbers according to latitude where the corresponding study was done:

- Leitgeb et. al. found a prevalence of 1.5% in Austria in 1995 (40)
- Hillert et. al. found an equal number in Sweden in 1997 (41)
- Levallois found a prevalence of 3.2% in California in 1998 (42)
- Schroeder found a 6% prevalence in Germany in 2002 (43)
- Fox found a prevalence of 11% in England in 2004 (44)

The gigantic global epidemic of children with autism has been associated with the irradiation of the pediatric population with EMFs (20).

Prenatal exposure to cell phones has been associated with behavioral problems such as hyperactivity and emotional crises in the school age (47).

The medical-scientific analysis that must be carried out from the epidemiological and medical-legal point of view in order to establish whether there is a causal link between exposure to EMFs and the commencement of brain tumors is openly positive in all components of the epidemiological templates used for this purpose, such as the Bradford Hill (45), Susser and Koch Henle's criteria. Evidently, it is not the engineers or the physicists of the industry, of the municipality, of the ministry, of the ICNIRP or of WHO's Electromagnetic Fields Project, the logically chosen ones to carry out this very delicate work that is not free of vested interests.

The epidemiological pattern of cancer in the world in relation to exposure to EMFs from wireless technologies has led different research groups to demand the urgent reclassification

of radiofrequencies as a type 1 carcinogen or confirmed carcinogen (49). This international outcry of medical associations and common citizens is due to the unusual incidence of diagnoses of glioma , acoustic neuroma, vestibular schwannoma and meningioma in patients irradiated with cell phone radiofrequencies, both adults and children.

Recent official reports from the CDC (Centers for Disease Control and Prevention) of the United States government, show that in the 196,200 pediatric cancer cases that occurred in the period 2001-2014, there was an increase in the incidence of brain, kidney, liver and thyroid cancer. The global cancer incidence rate was 173 per million and the highest incidence rates were for leukemia (45.6), brain tumors (30. 8) and lymphoma (26.0) (56).

VI. TREATMENT

The treatment of patients with EMFs or EHS disease requires an individual analytical approach according to the target organ involved, cotoxicities (heavy metal poisoning, pesticide poisoning, immunological sensitivities, among others) and comorbidities (dysautonomia, adrenal failure, hypothyroidism, cancer, among others). Given the multiple levels of action, both biochemical and biophysical, at which EMFs act on humans, the treatment of these patients becomes a truly major medical exercise of intellect.

As indicated by environmental toxicology, the first and most important step in patients irradiated with electromagnetic sources is to immediately remove them from the aggressor noxa. Intuitively, many patients around the world are moving away from urban centers to go into forests, jungles, caves and remote places where wireless technologies do not exist (if possible at all). The time away from urban centers depends on the clinical evolution of the patient.

A treatment scheme with antioxidants such as vitamin C and glutathione that temporarily relieve the patient's neurological symptoms has been tried. Vitamins and minerals have been added to these in order to improve the enzymatic and cellular functions (cofactors) that mediate the human antioxidant system given by superoxide dismutase, coenzyme Q10, glutathione and catalase.

Given the possibility that the clinical picture migrates to (or is added to) a multiple chemical sensitivity, steroids should not be used, except in exceptional cases. The patient should not be exposed to chemicals (chlorine from swimming pools, lotions, perfumes, varnish, paints, deodorants, tinctures, among others) since many of them worsen immune dysregulation and aggravate the clinical presentation. In addition, attempts have been made to block electromagnetic waves with Faraday cages.

Although there are reports of definitive cure in specialized centers (EHC-D, Environmental Health Center, Dallas, Texas, United States), many patients persist with intermediate symptoms that allow them a moderately acceptable social functioning and others remain in the most dysfunctional ostracism possible, regardless of what is done.

Twenty years ago, Dr. William Rea developed a revolutionary immunological procedure at the EHC-D called autogenous lymphocytic factor (ALF), which by means of lymphocytes culture, attempts to stimulate the immune system of the EHS patient, frequently affected by a severe dysregulation (53). Eighty-five percent of patients treated at the EHC-D with ALF have shown improvement (50).

BIBLIOGRAPHY

1. d'Arsonval JA. Sur les effets physiologiques de l'électricité. Paris: Vve Ch. Dunod;1898.
2. Firstenberg A. The invisible rainbow: a history of electricity and life. New Mexico: AGB Press;2017.
3. Kholodov YA. Influence of magnetic fields on biological objects. JPRS;1974.
4. Glotova KU, Sadchikova MN. Development and clinical course of cardiovascular changes after chronic exposure to microwave irradiation. JPRS51238;1970.
5. Effects of non-ionizing electromagnetic radiation, JPRS L/6135;1976.
6. Letavet AA, Gordon AV. The biological action of ultrahigh frequencies. Washington D.C.: JPRS 12471; 1962.
7. Kholodov YA. The effect of electromagnetic and magnetic fields on the central nervous system. Philadelphia: NASA; 1967.
8. Gordon ZV. Biological effect of microwaves in occupational hygiene. Jerusalem: Israel Program for Scientific Translations, NASA; 1970.
9. Novitskiy YI, Gordon ZV, Presman AS, et al. Radiofrequencies and microwaves. Magnetic and electrical fields. NASA; 1971.
10. Glaser ZR. Bibliography of reported biological phenomena ('effects') and clinical manifestations attributed to microwave and radiofrequency radiation. Naval Medical Research Institute, National Naval Medical Center; 1971. (Downloadable at: https://www.scribd.com/document/235319480/10955212-Evidence-Against-Cell-Phones-the-Glaser-List [internet] 2015 [accessed: January 18, 2019])
11. US government. The effects of electromagnetic radiation on biological systems: current status in the former Soviet Union. USA: SAIC; 1993.
12.http://www.elespiadigital.com/index.php/noticias/empresas/12985-en-la-urss-se-invento-en-el-primer-telefono-movil-del-mundo-el-9-de-abril-de-1957[internet] 2017 (accesso: January 17, 2019)
13. Steneck NH, Cook HJ, Vander AJ, Kane GL. The origins of U.S. safety standards for microwave radiation. Science. 1980;208(4449):1230-7.
14. Generation Zapped. Zapped Productions [internet] 2017 [accessed]: January 16, 2019]. Available at: http://www.generationzapped.com.
15. Williams JM. Biological effects of microwaves: thermal and nonthermal mechanisms. A report by an independent investigator. Wilsonville: John Michael Williams; 2016.
16. Giuliani L, Soffritti M. Non-thermal effects and mechanisms of interaction between electromagnetic fields and living matter: a selected summary. Eur. J. Oncol. 2010:5.
17. Cook HJ, Steneck NH, Vander AJ, et al. Early research on the biological effects of microwave radiation: 1940-1960. Ann Sci. 1980;37(3):323-51.
18. Censi F, Calcagnini G, Triventi M, et al. Interference between mobile phones and pacemakers: a look inside. Ann Ist Super Sanita.2007;43(3):254-9.

19. Roggeveen S, van Os J, Viechtbauer W, LousbergR. EEG Changes Due to Experimentally Induced 3G Mobile Phone Radiation. PLOS ONE. 2015; 10(6):113.

20. Kane RC. A Possible Association between fetal/neonatal exposure to radiofrequency electromagnetic radiation and the increased incidence of autism spectrum disorder (ASD). Medical Hypotheses (2004) 62, 195-198.

21. Pall ML. Microwave electromagnetic fields act by activating voltage-gated calcium channels: why the current international safety standards do not predict biological hazard. Recent Res Devel Mol Cell Biol. 2014;7:1-15.

22. 28th annual international symposium on man and his environment in health and disease. The chemical mechanisms leading to EMF sensitivity. Texas: University of North Texas, the American Environmental Health Foundation; 2010.

23. Zothansiama, Zosangzuali M, Lalramdinpuii M, et al. Impact of radiofrequency radiation on DNA damage and antioxidants in peripheral blood lymphocytes of humans residing in the vicinity of mobile phone base stations. Electromagn Biol Med. 2017; 36(3):295-305.

24. Marino A, McCarty DE, Carrubba S, Chesson AL, et al. Electromagnetic hypersensitivity: evidence for a novel neurological syndrome. Int J Neurosci. 2011;121(12):670-6.

25. Eger H, Hagen KU, Lucas B, et al. The influence of being physically near to a cell phone transmission mast on the incidence of cancer. Umwelt Medizin Gesellschaft 2004;17(4):326-32.

26. Dode AC, Leão MM, Tejo F de A, et al. Mortality by neoplasia and cellular telephone base stations in the Belo Horizonte municipality, Minas Gerais state, Brazil. Sci Total Environ. 2011;409(19):3649-65.

27. Abdel-Rassoul G, El-Fateh OA, Salem MA, et al. Neurobehavioral effects among inhabitants around mobile phone base stations. Neurotoxicology. 2007;28(2):434-40.

28. Hutter HP, Moshammer H, Wallner P, et al. Subjective symptoms, sleeping problems, and cognitive performance in subjects living near mobile phone base stations. Occup Environ Med. 2006;63(5):307-13.

29. An experimental study of the cataractogenic effects of microwave radiation. Rome Air Development Center;1964.

30. Zaret MM, Snyder WZ, Birenbaum L. Cataract after exposure to non-ionizing radiant energy. Br J Ophthalmol. 1976;60(9):632-7.

31. Russian national committee of non-ionizing radiation protection-2008 report. Moscow: RNCNIRP; 2008.

32. Bergman W. The effect of microwaves on the central nervous system. Ford Motor Company;1965.

33. Havas M. Radiation from wireless technology affects the blood, the heart, and the autonomic nervous system. Rev Environ Health. 2013;28(2-3):75-84.

34. Carrubba S, Frilot C, Chesson A, et al. Detection of nonlinear event-related potentials. J Neurosci Methods. 2006;157(1):39-47.

35. Bevington, M. Electromagnetic sensitivity and electromagnetic hypersensitivity: a summary. Capability Books;2013.

36. Rezk AY, Abdulqawi K, Mustafa RM, et al. Fetal and neonatal responses following maternal exposure to mobile phones. Saudi Med J.2008;29(2):218-23.

37. Milham S. Historical evidence that electrification caused the 20th century epidemic of ‘‘diseases of civilization”. Med Hypotheses. 2010;74(2):337-45.

38. Milham S. Historical evidence that residential electrification caused the emergence of the childhood leukemia peak. Med Hypotheses. 2001;56(3):290-5.

39. Milham S. Evidence that dirty electricity is causing the worldwide epidemics of obesity and diabetes. Electromagn Biol Med 2014;33(1):75-8.
40. Leitgeb, N. (1998). Electromagnetic hypersensitivity. En: Leitgeb N (editor). International workshop on electromagnetic fields and non-specific health symptoms. Graz, Austria: COST 244bis; 1998. pp. 11-20.
41. Hillert L, Berglind N, Arnetz BB, et al. Prevalence of self-reported hypersensitivity to electric or magnetic fields in a population-based questionnaire survey. Scand J Work Environ Health. 2002;28(1):33-41.
42. Levallois P, Neutra R, Lee G, et al. Study of self-reported hypersensitivity to electromagnetic fields in California. Environ Health Perspect. 2002;110 Suppl 4:619-23.
43. Schroeder, E. Stakeholder-Perspektiven zur Novellierung der 26.BlmSchV. Ergebnisse der bundesweiten Telefonumfrage im Auftrag des Bundesamtes für Strahlenschutz. München: I+G Gesundheitsforschung; 2002.
44. Fox E. Rapporteurs Report. WHO Workshop on Electrical Hypersensitivity. 2004:25-7.
45. Hardell L, Carlberg M. 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. Rev Environ Health. 2013;28(2-3):97-106.
46. Sage C. The implications of non-linear biological oscillations on human electrophysiology for electrohypersensitivity (EHS) and multiple chemical sensitivity (MCS). Rev Environ Health. 2015;30(4):293-303.
47. Divan HA, Kheifets L, Obel C, Olsen J. Prenatal and Postnatal Exposure to Cell Phone Use and Behavioral Problems in Children. Epidemiology. Volume 19, Number 4, July 2008.
48. Kamal A, The effect of using cell telephone on autonomic system in children. Journal of Systems and Integrative Neuroscience.2016; 2(4): 1-4.
49. Miller A, Morgan L, Udasin I, Davis D. Cancer epidemiology update, following the 2011 IARC evaluation of radiofrequency electromagnetic fields(Monograph 102). Environmental Research. 2018; 167: 673-683.
50. Rea WJ, Patel K. Reversibility of Chronic Degenerative Disease and Hypersensitivity. Regulating Mechanisms of Chemical Sensitivity. Volume 1.CRC Press. 2010. p. 185-505.
51. Rea WJ, Patel K. Reversibility of Chronic Degenerative Disease and Hypersensitivity. The Effects of Environmental Pollutants on the Organ System. Volume 2. CRC Press. 2015. p.41.
52. Rea WJ, Patel K. Reversibility of Chronic Degenerative Disease and Hypersensitivity. Clinical Environmental Manifestations of the Neurocardiovascular Systems. Volume 3. CRC Press.2015. p.46.
53. Griffiths, B.B., Rea W.J., Pan Y. The role of the T lymphocytic cell cycle and an autogenous lymphocytic factor in clinical medicine. 1998. Cytobios 93(372):49-66.
54. The Bioinitiative Report. [internet] 2012 [accessed: January 18, 2019]. Available at: https://www.bioinitiative.org/
55.https://www.scribd.com/document/397649606/Clusters-of-Cancer-and-Dead-in-the-Spanish-Press-Around-Cell-Phone-Antennas-and-Base-Stations [internet] 2019 [accessed: January 17, 2019].
56. 2018 American Society of Pediatric Hematology Oncology Conference “INCIDENCE RATES AND TRENDS OF PEDIATRIC CANCER —UNITED STATES, 2001–2014”.David Siegel, Jun Li, S. Jane Henley, Reda Wilson, Natasha Buchanan Lunsford, Eric Tai, Elizabeth Van Dyne. Centers for Disease Control and Prevention, Atlanta, Georgia, United States.