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Comment:

Autism cases have increased almost six-fold since the 1970s, and most dramatically in the last decade, accompanying the largest increase in use of cell phones and other mobile devices. Over the last decade, there has been a significant amount of research on the health risks of electromagnetic radiation exposure. One suggested mechanism for how EMR effect human cells involves cell membrane protective responses being triggered that disrupt microtubule functions in intercellular communication, and close active transport channels. This leads to a number of symptoms, including a decrease in cellular energy and cell membrane permeability. Decreased cell membrane permeability causes a build up of waste products within cells. If the cells were exposed to heavy metals such as mercury, the molecules would become trapped due to the closed active transport channels. Based on this hypothesis, an EMR free environment should allow active-transport channels to re-open, leading to heavy metal clearance. Various methods of metal detoxification have been used to treat autism. This study aims to assess if eliminating EMR exposure leads to heavy metal excretion, which could link EMR to causing autism symptoms.

In this study, data was collected from clinical records on Autism patients who were treated by reducing EMR exposure. The treatment regimen was made up of 40 intervention sessions two to three times a week in the EMR-free environment, each lasting 4 hours. Samples of urine, hair, and feces were taken from the subjects at that beginning of the study, after 20 sessions, and after 40. One set of subjects, who had kidney weakness, showed an increase in mercury, lead, and uranium over time while undergoing the treatment. A second set of subjects, whose primary issue had been liver clearance, showed consistent increases in antimony, mercury, lead, and uranium excretion.

These results show that when EMR exposure was reduced, heavy metal clearance occurred over time, with lighter molecules being cleared first., followed by the heavier molecules. This indicates that EMR exposure may play a role in causing Autism symptoms. It likely acts in conjunction with environmental and genetic factors in bringing about the onset of the disease.

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Wireless Radiation in the Etiology and Treatment of Autism: Clinical Observations and Mechanisms

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Abstract

Background

Autism is an enigmatic, disabling neuro-developmental disorder that has increased in incidence almost sixty-fold since the late 1970s, but with the most dramatic increase occurring over the past decade. There is no consensus on the cause of Autism, and thus there are few reliable approaches to either preventive or therapeutic intervention.

Objective

This study was conducted to assess mechanistically the role of wireless device-associated EMR in the etiology and treatment of Autism. Specifically, the relationship between molecular weight-specific heavy metal clearance in children receiving detoxification intervention including energetic nutrition for Autism and the length of time the children were treated in an electro-magnetic radiation (EMR) free environment was evaluated.

Design

Data were recorded from clinical records and arrayed according to the intervention regimen followed by each subject. The pattern of heavy metal clearance was assessed through the three distinct excretion pathways of urine, skin and feces. The first child subjected to the EMR-sensitive protocol was the sentinel indicator. Data from this subject were analyzed as a pilot to assess whether or not any clinical indications were present supporting the working hypothesis that time and molecular weight dependent heavy metal clearance was associated with symptom amelioration. Records were gathered from 20 other subjects in the clinic following the same intervention protocol in subsequent months.

Results

The sentinel subject's history suggested that the efficiency of heavy metal detoxification was dramatically increased when EMR was eliminated. For the larger groups, data indicated that heavy metals were cleared in a time and molecular weight-dependent manner after EMR was eliminated from the treatment environment.

Conclusions

The findings suggest a significant role of EMR in both the etiology of Autism and the efficacy of therapeutic interventions. The mechanism of EMR impact could be direct by facilitating early clinical onset of symptoms or indirect, including trapping heavy metals in cells and both accelerating the onset of symptoms caused by heavy metal toxicity as well as impeding therapeutic clearance. These data also suggest that wireless device EMR is a synergen in the etiology of Autism, acting in conjunction with environmental and genetic factors, and offer a mechanistic explanation for the correlation between concurrent increases in the incidence of Autism and the use of wireless technology.

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Introduction

Autism is an enigmatic, disabling neuro-developmental disorder that has increased in incidence almost sixty-fold since the late 1970s, but with the most dramatic increase occurring over the past decade [1, 2]. The condition most commonly presents in early childhood and occurs in males four times more frequently than in females [3, 4]. Etiologic hypotheses include: genetic predisposition to Autism including impaired methylation capacity with resultant inability to clear heavy metals, increased vulnerability to oxidative stress, and impaired neurological adaptability function; environmental exposures including mercury preservatives in vaccines, trans-generational accumulation of heavy metals and biological conditions including Lyme Disease[5]. There is no consensus on the cause of Autism, and thus there are few reliable approaches to either preventive or therapeutic intervention. As the incidence of Autism continues to increase, the urgency of identifying means of controlling the disease becomes more acute.

Symptoms in Autistic patients include: diminished language skills and deficits in social interactive ability; liver and kidney function deficits; gastro-intestinal disease; autoimmune disease; and mental retardation[6-16]. The constellation of behavioral symptoms is consistent with pathology that involves disruption of normal inter-cellular communication [17].

Heavy metal toxicity has emerged as a primary etiologic focus, with most emphasis on mercury exposure derivative of vaccines, dental amalgams and environmental load from ingestion of contaminated seafood. It is believed that the physiological effects of heavy metals are mediated through interference with protein synthesis and subsequent structure and function of enzymes. From a pathological mechanism perspective, mercury vapor has been shown to inhibit tubulin polymerization into microtubules; mercury ions, uniquely among metals, inhibit the growth of neuronal

somata making it a strong causal factor in neuronal degeneration. Microtubules are important functionaries in intercellular communication and disruption of this primary communication route is a viable mechanism consistent with a number of the etiologic hypotheses for Autism including increased vulnerability to oxidative stress, impaired neurological adaptability and heavy metal accumulation[18-24].

Concurrent with the increased incidence of Autism and its quixotic clinical challenges, have been the dramatic increase in general population usage of mobile telephones and wireless communication devices. Between 1998 and 2007, wireless technology usage has increased from 200 million worldwide to more than 3 billion. Recent environmental impact data regarding migratory birds and honey bee colony collapses suggest that the background concentrations of wireless technology related electro-magnetic radiation (EMR) are reaching saturation points where exposures can not be avoided in most populated areas. The concern here is that increasingly high ambient exposures to EMR over the past decade portend in utero, post-natal and early childhood exposures that are unabated or for which normal physiologic compensatory mechanisms are inadequate [25-30].

The controversy about wireless technology health risks is now well into its second decade, but there is an emerging consensus that electro-magnetic radiation (EMR) emissions from these devices are biologically active. It is noteworthy that the pathology mechanisms reportedly underlying wireless device-related health effects include disruption of microtubule-based intercellular communication mediated through inappropriately triggered cell membrane protective responses that compromise cellular energy. Also included among the cell membrane responses is closing down of active transport channels resulting in decreased cell membrane permeability, further deficits in cellular energy, intra-cellular free radical build-up, disruption of normal DNA repair and a wide range of consequent symptoms[31-48].

Both EMR induced disruption of intercellular communication and lowered cell membrane permeability would be clinically relevant to the etiology and the treatment of Autistic patients with respect to symptom severity (intercellular communication) and diminished ability to clear metals (decreased permeability would result in higher intracellular concentrations of heavy metals).

There is a general consensus emerging among clinicians that first level treatment regimens for Autistic patients should include heavy metal detoxification. Various protocols have been utilized, including aggressive chelation with agents including dimercaptosuccinic acid (DMPS), ethylene diamine tetraacetric acid (EDTA) and dimeracptopropane-1-sulfonic acid (DMSA). These approaches yield varying efficacy and are sometimes accompanied by serious side effects. Nonetheless, the value of metal clearance is underscored by symptom amelioration when significant metal concentrations can be removed[5].

A primary challenge, therefore in managing Autism cases is determining detoxification protocols and methods that effectuate efficient metal clearance without harmful sequelae. During 2005, clinical protocols were adapted in the Internal Balance clinic to address the possible link between wireless device emissions and interference with both intercellular communication and heavy metal clearance capacity. Changes were implemented to create an EMR free treatment regimen, including both a 'clean' clinical environment as an adjuvant treatment and 'take-home' interventions as maintenance.

The implementation of the EMR sensitive treatment protocols provided a unique natural experiment regarding the possible link between EMR and Autism. Following from the epidemiological Koch-Henle postulates for cause and effect, a specific observational study was defined using the unique clinical data gathered to monitor heavy metal detoxification. The working concept was 'dose-response down' with respect to cell membrane kinetics [48]. If it is true that exposure to EMR decreases cell membrane permeability by closing active transport channels, then it would follow that eliminating EMR exposure would open active transport channels and result in heavy metal clearance according to molecular weight – with light metals clearing throughout, but with the heavier metals not clearing until later in the treatment regimen. These same findings would indicate a synergistic role of EMR in the etiology of Autism and would offer a mechanistic explanation for the strong correlation between the rising incidence of Autism and the dramatic increase in the use of wireless technology over the past half decade.

Methods

Objective

The objective of this study was to assess the role of EMR in the etiology and treatment of Autism mechanistically by evaluating the relationship between molecular weight-specific heavy metal clearance in children being treated for Autism and the length of time the subjects were being treated in an EMR-free environment. If heavier metals clear later in the treatment process, that evidences a time-dependent opening of the cell membrane active transport channels following elimination of EMR in the subject's environment. Such a finding would also support the hypothesis that EMR was a factor in closing the active transport channels at the outset in these patients.

Design

The study followed a post-hoc clinical observation design. Data were gathered for clinical purposes and no manipulations of data in terms of definition or gathering were followed to enhance the precision of the measurements. Data were recorded from clinical records and arrayed according to the intervention regimen followed for each subject. The pattern of heavy metal clearance was assessed through the three distinct excretion pathways of urine, skin (estimated through hair) and feces. Analysis of metallic elements in urine provides diagnostic information on toxic elements including lead, mercury, beryllium, arsenic and aluminum, as well as the efficiency of renal resorption of essential metabolic elements including magnesium, calcium, sodium and potassium. Scalp hair element levels indicative of dermal clearance were monitored to provide quantification of systemic metal loads. Fecal metal levels provide insight into the depth of toxic metal burden. For many heavy metals, fecal excretion indicates biliary involvement with feces becoming the primary natural route of elimination from the body.

The first child subjected to the EMR-sensitive protocol was viewed as the sentinel indicator because this subject had a long history of difficulty in clearing metals along with years-long persistence with seriously debilitating Autism related symptoms. This subject had a comprehensive medical records history of metal burden toxicity prior to the implementation of the EMR-free environment intervention, and the longest experience with the new intervention protocol. Data from this subject were first analyzed as a pilot to assess whether or not any clinical indications were present supporting the working hypothesis of time dependent heavy metal clearance and symptom amelioration. Based on the sentinel data, records were gathered from the other subjects in the clinic following the same intervention protocol over subsequent months. Data from the sentinel subject were also included in the summary data of the larger study group.

The general clinical protocol regimen included forty intervention sessions of four hours in duration, two to three times weekly in the EMR-free clinic environment. Subjects were given intervention in a sequential protocol that included a series of non-chelation provocations and nutritional formularies focused on mitochondrial resuscitation depending on the clinical profile of the client. Two general categories of subjects were defined for clinical purposes: those with liver clearance as an indicated vulnerability and those with kidney function weakness. These determinations are critical for precision in intervention for each subject and were based on a priori laboratory analyses, acupuncture meridian tests, medical history, consultations with subject's parents and clinician observations.

The EMR-free clinical environment was constructed by eliminating all wireless communication devices from the building, requiring that cell phones be turned off on the

premises, and installing various EMR filters to electrical circuits and appliances in the clinic. Applications of body worn sympathetic resonance technology, energy resonance technology and molecular resonance effect technology were introduced as appropriate. The premises were tested with appropriate EMR detection devices including gauss meters and radio frequency radiation detection equipment to ensure that the clinic was indeed EMR-free. Further EMR protection was recommended to each subject's parents so that the home environment was also without EMR interference.

Main Outcome Measures

Urine, hair and fecal samples were taken at three points in the course of each subject's treatment: at baseline, following 20 treatments and following 40 treatments. Sampling protocols were implemented according to those recommended by the laboratory contracted for conducting the analyses. It is noteworthy that provocation doses of chelating agents were not utilized. The clinical goal was to assess the subject's capacity to detoxify and clear heavy metals on their own. The clinical assessment did not include provoking outcomes with chelating procedures that were not part of the regular program. The following metals were included for subjects determined to have kidney function as a primary concern: beryllium (Be), aluminum (Al), arsenic (As), antimony (Sb), mercury (Hg), lead (Pb) and uranium (U). For those subjects with liver function as a primary concern, copper (Cu) and tin (Sn) were added. Statistical tests for trend were conducted using Chi-Square procedures. Even though the data were not gathered contemplating statistical trend analyses, it was judged that inclusion of such analyses would be useful for context. However, the primary evaluative tool was qualitative assessment of consistent trend and clinical significance.

Results

Sentinel Indicator

Clinical Presentation Summary. The sentinel subject was a male diagnosed with severe Autism in 1998 at the age of 3. His condition was judged as remaining severe when he presented to the Internal Balance clinic in 2004, despite having worked with many top notch practitioners in the field of Autism. He could not talk; had many urination accidents; did not hold utensils to feed himself very well; and he would repetitively clang his utensil on the plate that held his meal. The only words he could utter were 'yes' and 'no'. His anxiety level was extremely high. He would freeze while transitioning from indoors to outdoors, holding his head (as if he were having a brain freeze from a cold drink) and at the same time he would close his eyes and wait until he had a sense of where he was spatially. He continually had strong histamine reactions to foods, and would crave the foods that gave him the reactions. He would tap repeatedly with his fork on the side of his plate and peer at others while at the dinner table from an angle, not straight on. After eating certain food items he would immediately turn red, begin to have stray arm movements and quickly become giddy and uncontrollable. He was not cooperative in the clinic at all and his father had to coax him and sometimes physically move him into each intervention session for four hours everyday for two weeks. Prior to presentation at the clinic, he had been chelated, virally provocated, detoxed with far-infrared sauna therapy, been given Secretin and IVIG, but still had made only modest progress with his symptoms. No appreciable levels of heavy metals had been cleared despite several years of attempts with various procedures. Although there were times when heavy metals were cleared, it was usually related to spiking the sample with a provocation agent and there was no prolonged successful clearing. In September, 2004, a modified nutritional supplement regime was introduced to him, yet no significant metal clearance changes occurred. In March, 2005, an onsite, intensive detoxification regimen was implemented, with controls for chemicals in the home and in the environment that he would be treated in. Specifically addressed were electrical, water, and air pollution, use of cleaning chemicals, laundering criteria, and controls for scents and bedding. He was classified as both a kidney and liver focused subject. He was treated with two 40-session intervention cycles that included the EMR-free environment. While metals began to clear immediately during the first intervention series, his symptoms remained severe until near the 35th session. During the second intervention series, metals continued to clear significantly and his symptoms began to subside as observed by both his parents and validated by the clinicians attending to him. Clinically, the EMR-free environment was an important facilitator of heavy metal clearance, including mercury. There also appeared to be a direct correlation between significant heavy metal clearance and amelioration of his symptoms.

Metal Excretion Profiles

Table 1 presents the urine, hair and fecal excretion data for the first 40 intervention series, with metals arrayed according to increasing molecular weight. Hair levels of arsenic and mercury decreased over time, while hair antimony levels increased. Fecal arsenic increased along with mercury, lead and uranium. Table 2 presents similar data for the second series.

In the second intervention series, urine arsenic and lead increased significantly while urine mercury decreased. Hair levels of aluminum, arsenic, antimony, mercury, lead and uranium appeared to trend upward. Fecal arsenic decreased, while antimony and mercury trended upward. The concentration of mercury cleared in the second series was higher than in the first.

Kidney and Liver Subject Series

Tables 3 and 4 present urine, hair and fecal excretion profiles for the kidney and liver subject series. Most significant is that among the kidney subjects, heavier metals mercury, lead and uranium show consistent upward excretion trends over time. For liver subjects, the same trend is evident for antimony, mercury, lead and uranium.

These data indicate that heavy metals were cleared in these subjects in a time-dependent and molecular weight-dependent manner after EMR was eliminated from the clinic and home environment. The finding suggests a significant role of EMR in the etiology of Autism as well as in the efficacy of therapeutic interventions to control the disease. The impact of the EMR exposure could be direct in facilitating earlier clinical onset of symptoms related to genetic predispositions or indirect, the result of trapping heavy metals in cells and thus accelerating the onset of symptoms mediated by those metals. These two mechanisms of early onset and acceleration could interact synergistically, leading to the suggestion that wireless device EMR is a synergen in the etiology of Autism, acting in conjunction with environmental and genetic factors.

Clinical Addenda

The sentinel indicator subject showed no appreciable change or improvement in heavy metal clearance for seven years prior to the implementation of the EMR-free intervention protocols. After the implementation of the new protocols, his condition steadily improved clinically during the end of the first intervention series and into the second. Supplemental to the laboratory evaluations, was monitoring for EMR related toxicity through kinesiology and energy system protocols. The qualitative measures scored toxicity on a scale from 0 to 100, with his initial readings at 90. At the conclusion of the second series, his EMR toxicity score was 10. It is clear that the EMR

Table 1

Sentinel Indicator Metal Excretion Data: Urine, Hair, Feces, In EMR Controlled Environment throughout Course of Intervention – First Three-Month Course*

Metal:	Be	Al	As	Sb	Hg	Pb	U	
Molecular Wt:	9.0	26.9	74.9	121.8	200.6	207.2	238.0	
Urine (ug/g creat)								
Baseline	0.0	0.0	130.0	0.00	2.1	1.1	0.0	
Twenty Rx	0.0	0.0	1350.0		0.10	0.0	0.0	0.0
Forty Rx	0.0	67.0	83.0	0.00	2.0	0.0	0.0	
Hair (ug/g)								
Baseline	0.0	9.5	**0.14**	**.035**	**3.9**	1.3	0.005	
Twenty Rx	0.0	8.0	**0.11**	**.071**	**3.5**	1.1	0.001	
Forty Rx	0.0	8.1	**0.08**	**.170****	**2.7**	1.6	0.015	
Feces (mg/kg)								
Baseline	0.003		**0.76**	.094	**0.00**	**0.22**	**.049**	
Twenty Rx	0.000		**1.95**	.068	**0.02**	**0.45**	**.060**	
Forty Rx	0.023		**3.31****	.170	**0.19****	**1.39****	**.253****	

*Readings in bold indicate consistent trend ** Trend significance: p< .05

Table 2

Sentinel Indicator Subject Excretion Data: Urine, Hair, Feces, In EMR-Controlled Environment throughout Course of Intervention – Second Three-Month Course*

Metal:	Be	Al	As	Sb	Hg	Pb	U
Molecular Wt:		9.0	26.9	74.9	121.8	200.6	207.2 238.0
Urine (ug/g creat)							
Baseline	0.0	25.0	**190.0**	0.10	**4.80**	**0.70**	0.00
Twenty Rx	0.0	17.0	**410.0**	0.30	**3.70**	**0.90**	0.00
Forty Rx	0.0	120.0	**830.0****		0.00	**2.00**	**2.60**** 0.00
Hair (ug/g)							
Baseline	0.0	**5.9**	**0.10**	**0.11**	**3.00**	**0.62**	**0.003**
Twenty Rx	0.0	**76.4**	**0.89**	**0.82**	**7.34**	**4.10**	**0.467**
Feces (mg/kg)							
Baseline	0.048		**3.54**	**0.102**	**0.044**	0.92	0.094
Twenty Rx	0.017		**0.61**	**0.126**	**0.116**	0.46	0.067
Forty Rx	0.019		**0.45****	**0.298**	**0.222****		0.80 0.266

*Readings in bold indicate consistent trend ** Trend significance: p< .05

toxicity was concurrent with his inability to excrete cellular toxins and to heal his central nervous system. This subject's father is convinced that the key to unlocking his child's recovery was the link to EMR toxicity and its role in why mercury was being stored in his system and not cleared. The subject presented with severe impairment to brain and hormonal communication networks to the point where he was significantly debilitated. Cortisol levels were elevated prior to the implementation of the EMR-free intervention regimen but were stabilized afterwards. Clinically, he began to speak and told of such occurrences as "the noise was gone from his head". While the satellite radio, halogen and fluorescent lights continued to bother him, the computers, DVD's, and wireless devices no longer seemed to be problematic. Both halogen and fluorescent lights contain mercury and titanium and those could be the source of the adverse reaction.

In the larger series, it is noteworthy that the hepato-toxicity of aluminum and the nephrotoxicity of beryllium were apparent. Liver-focused subjects tended to clear more aluminum while kidney-focused subjects cleared more beryllium. This suggests that there are possibly two categories of injured children: those exposed as a result of trans-generational accumulation and those exposed as a result of trans-gestational accumulation during embryonic and fetal development. Thus, the familial pre-disposition might indeed be the result of combined susceptibility due to insufficient methylation genetics and excessive environmental loading.

The Role of EMR

Current science defines two distinct types of EMR plume capable of contributing to the development of Autism in children exposed to wireless technology related exposures in utero and in early childhood. The near-field plume has been studied most extensively relative to mobile phones, base stations and other EMR generators, because this plume – usually within six to eight inches from the center of the antenna generating a radio frequency signal from a cell phone and several hundred feet for a base station antenna – contains the most intense energy and is therefore able to penetrate more deeply into biological tissue. The far-field or ambient exposure plume that derives from the enormous numbers of simultaneously switched-on wireless devices, has less energy associated with it, although studies indicate that energy intensity is not the primary determinant of adverse biological impact. At least one series of studies has suggested that genetic effects can indeed result from far-field exposures[39-41]. Every person who uses a mobile phone or uses wireless connections to access the Internet is exposed to both the near-field and far-field radiation. Those living or working in the vicinity of base-stations or masts are exposed also to ambient far-field EMR, and that includes children who may subsequently develop Autism.

Given exposure to EMR, studies further show that coherence, or form, of the information carrying wave is the determining factor in biological effects[43, 44]. The likelihood that biological responses associated with both near-field and ambient exposures to wireless device related EMR derives from recognition that a series of events are triggered by biological cell membrane recognition that a coherent, invading radio wave is present. It is noteworthy that the carrier wave in the radiofrequecy bands of the EMR spectrum – ranging from around 837 megahertz to around 1900 megahertz – is not easily recognized by the biological cell membrane. The oscillation is too fast to be picked up by cell membrane ciliary sensor proteins that respond to compatible vibration [44]. Membrane recognition occurs when the information carrying wave – a secondary wave oscillating in the hertz range – is present. For example, there is a 2 hertz signal identifying presence of a cell phone in range of a base station; and hertz frequency waves carry packeted information whenever talking, music, games, etc are transmitted [48-50].

Once membrane recognition occurs, a series of protective biochemical reactions are initiated inside the cell[46]. Included are stress protein responses that serve to effectively "harden" the cell membrane and disrupt active transport. The "membrane hardening" effect causes a build-up of intracellular waste products; including highly reactive free radicals. Where heavy metal exposure including mercury has occurred, it is likely that these large molecules would become trapped intracellularly because the active transport channels would not be opened enough to accomodate their excretion.

These reactive molecules are involved in at least three mechanistic pathways associated with disease induction. The first occurs when mitochondria are attacked resulting in cellular dysfunction – for example, evidenced by studies showing leakage in the blood-brain barrier following EMR exposure. The second is interference with normal DNA repair processes as evidenced by studies showing the presence of micronuclei in cells following EMR exposure. The third involves alterations in mRNA folding and consequent transciption of 'under stress' messages to mitochondrial and nuclear DNA, causing the structure of mitotic daughter cells to be altered. This third mechanism represents an environmentally induced genetic change that could explain the self-replicating pathology present in Autistic patients[51-53].

Table 3

Kidney Subjects Average Excretion Data: Urine, Hair, Feces, In EMR-Controlled Environment throughout Course of Intervention – 3 months average*

Metal:	Be	Al	As	Sb	Hg	Pb	U
Molecular Wt:	9.0	26.9	74.9	121.8	200.6	207.2	238.0
Urine (ug/g creat)							
Baseline (n=13)	18.2	57.1	57.9	0.2	1.6	11.2	**0.00**
Twenty Rx (n=10)	8.7	92.8	179.5	17.1	1.9	1.6	**0.01**
Forty Rx (n=8)	17.5	27.8	168.0	0.1	1.2	3.1	**0.06****
Hair (ug/g)							
Baseline (n=11)	0.008	12.38	0.22	0.07	0.51	2.58	0.04
Twenty Rx (n=9)	0.032	16.78	0.18	0.06	0.91	2.58	0.03
Forty Rx (n=10)	0.025	12.46	0.05	0.08	0.46	0.78	0.09
Feces (mg/kg)							
Baseline (n=13)	**0.053**		0.58	**0.16**	**0.02**	**0.4**	**0.08**
Twenty Rx (n=13)	**0.112**		0.49	**0.12**	**0.06**	**1.1**	**0.12**
Forty Rx (n=9)	**0.312****		0.88	**0.12**	**0.07****	**3.3****	**0.17**

*Readings in bold indicate consistent trend ** Trend significance: p< .05

From a clinical disease perspective, these mechanistic pathways impact all critical levels of neuro-behavioral functioning. DNA repair interference and disruption of normal apoptosis can lead to self-replicating genetic mutational changes – consistent with the familial predisposition to diminished neuro-adaptation. General impairment of normal cellular function, especially mechanisms that are meant to stop aberrant cell growth and compensate for environmental insult, is a mechanism that can explain increased susceptibility to oxidative stress.

The composite effect of cellular dysfunction caused by exposure to EMR is disruption of intercellular communication in both the gap-junction and microtubule systems[42, 47, 52]. When cells are not able to communicate, functional requirements between cells, tissues and organs are not met and physiologic processes become compromised. For example, when intercellular communication is disrupted, messages from local cell groups or tissues are not carried to the immune, nervous or endocrine systems. The effects of this break in communication are felt at the organ and organism level resulting frequently in clinical symptoms consistent with the presentation of Autism.

With respect to synergies between radio wave related EMR and heavy metal burden, mechanisms other than intracellular trapping are likely operating as well. Studies show that electro-magnetic fields (EMFs) produce current in metals and increase the effects of galvanism. The close relationship between antimony and mercury in the clearance profiles could evidence this relationship. Antimony and other heavy metals have a profound impact on whether or not mercury exists in a gaseous or solid state within the cell, with the balance shifted toward vapor in the presence of other metals. Mercury clears only when in the solid state, and it therefore follows that mercury clearance in these patients occurred most profoundly after antimony had also begun to clear, leaving more mercury in a solid state and primed for excretion. EMFs are present in the environment surrounding every biological cell, and it has been shown that these fields are capable of passing through the cell membrane reaching intracellular metals and causing intracellular heating[54-65]. Irrespective of which mechanism or combination of mechanisms is operating, it is clear that each provides biological plausibility to the hypothesis that EMR is a synergen in the etiology of Autism.

Table 4

Liver Subjects Average Excretion Data: Urine, Hair, Feces, In EMR-Controlled Environment throughout Course of Intervention – 3 months average*

Metal:	Be	Al	Cu	As	Sn	Sb	Hg	Pb	U
Molecular Wt:	9.0	26.9	63.5	74.9	118.7	121.8	200.6	207.2	238.0
Urine (ug/g creat)									
Baseline (n=11)	0.0	**4.6**		61.8		0.09	1.69	1.6	0.00
Twenty Rx (n=9)	0.0	**6.4**		220.4		0.54	0.83	17.1	0.01
Forty Rx (n=8)	0.0	**25.3****		138.9		20.2	1.61	3.4	0.01
Hair (ug/g)									
Baseline (n=12)	0.0	**11.1**	**43.3**	**0.11**	0.38	0.14	**1.31**	0.98	0.10
Twenty Rx (n=6)	0.7	**12.7**	**44.0**	**0.15**	0.59	0.14	**1.22**	1.37	0.11
Forty Rx (n=7)	0.0	**17.4**	**198.3****	**0.19**	0.34	0.07	**0.81**	0.86	0.11
Feces (mg/kg)									
Baseline (n=11)	0.0			0.83		**0.11**	**0.03**	**0.47**	0.21
Twenty Rx (n=10)	0.0			0.77		**0.13**	**0.07**	**0.56**	0.26
Forty Rx (n=7)	0.0			0.81		**0.14**	**0.11****	**0.71**	0.29

*Readings in bold indicate consistent trend ** Trend significance: p< .05 Discussion

Strengths and Weaknesses of Study

This study presents the first clinical data to link wireless technology-related EMR in the environment to Autism and thus presents an important trigger for other clinicians with similar databases to assess whether or not these data can be corroborated. It is noteworthy that every important public health threat was first discovered through clinical observations and thus it is important to take these data seriously. The identification of several mechanistic pathways for the concurrence of Autism's increased incidence and the increase in wireless technology usage adds strong evidence of biological plausibility for the relationship. Although statistical significance tests were not the main evaluative tool, there was a consistent qualitative trend evident in the data that would have been unlikely to occur by chance.

Nonetheless, the study was a retrospective observation based on subjects with severe Autism whose parents chose to pursue alternative metal detoxification methods after other traditional approaches had failed. There is a likelihood that the parents and the subjects alike were vested in a positive outcome and it is possible that those strong desires had an impact on the favorable metal clearance through placebo mechanisms. However, the working hypothesis that metal clearance would be time and molecular weight dependent based on measurements of the length of time in an EMR-free treatment environment and the sequence of heavy metal clearance was determined post hoc so there was no operational knowledge of the intent of the study by the subjects, parents or the clinicians.

Clinical Significance

It is important to note that the clinic where this work was completed is not a medical facility and the interventions used are intended to evaluate whether removal of metals would improve the child's life and provide hope for the families involved. All parents signed consent forms understanding that these protocols were not intended to treat a medical condition but to improve the wellness and livelihoods of their children.

While the purpose of the study was to test a working EMR-free protocol implementation, the seemingly dramatic trends observed can not be trivialized. From a clinical perspective, it is clear that heavy metal detoxification was greatly facilitated by the elimination of EMR from the treatment environment. It would be important that other clinicians with similar intervention protocols in place attempt corroboration analyses and publish those as well.

1. Tamara J Mariea, Internal Balance Inc, Nashville TN and Safe Wireless Initiative, Washington, DC

2. George L Carlo, Science and Public Policy Institute, Safe Wireless Initiative and The George Washington University School of Medicine and Health Sciences, Washington, DC

References supplied on request and available on <www.acnem.org>