Life Science Journal

Websites:
http://www.lifesciencesite.com
http://www.sciencepub.net

Emails:
editor@sciencepub.net
sciencepub@gmail.com

MARSLAND PRESS
Multidisciplinary Academic Journal Publisher

Mobile Phone Radiation and Human Serum Components: A Short Literature Review on Recent Findings

Hamid Nasri[1]*, Parto Nasri[2], Milad Baradaran-Ghahfarokhi[3], Daryoush Shahbazi-Gahrouei[3], Jafar Fattahi-asl[4]

1. Department of Internal Medicine, Isfahan University of Medical Sciences, Isfahan, Iran
2. School of Medicine, Isfahan University of Medical Sciences, Isfahan, Iran
3. Department of Medical Physics and Medical Engineering, School of Medicine, Isfahan University of Medical Sciences, Isfahan, Iran
4. Medical Physics Department, School of Medicine, Ahvaz Jundishapour University of Medical Sciences, Khuzestan, Iran

hamidnasri@yahoo.com

Abstract: In recent years, a growing concern about the possible health hazards of mobile phones radiofrequency radiation has increased considerably among almost everyone in the world, even on those who do not have such phones. Moreover, new technologies, which use the spectrum of high frequency emissions, are incorporated in many aspects of telecommunications. As a consequence, there is a lot of interest about the possible effects of the radiation emitted from the cell phones which are engaged in the telephony. This paper presents a review on recent findings of our research team on the effects of cell phones radiation on human serum chorionic gonadotropin (hCG), ferritin and triiodothronine (T3) levels.

[Nasri H, Nasri P, Baradaran-Ghahfarokhi M, Shahbazi-Gahrouei D, Fattahi-asl J. **Mobile Phone Radiation and Human Serum Components: A Short Literature Review on Recent Findings**. *Life Sci J* 2021;18(4):50-55] (ISSN:1097-8135). http://www.lifesciencesite.com. 8.doi:10.7537/marslsj180421.08.

Keywords: Mobile phone, human serum, chorionic gonadotropin, ferritin, triiodothronine, immunoassay technique

1. Introduction

In recent years, various and profound investigations have been carried out in order to investigate the possible biological effects of mobile phones radiofrequency (RF) radiation on mammals, including the human population [1, 2]. Herein, a growing concern about the possible health hazards has increased considerably among almost everyone in the world, even on those who do not have such phone [3-5].

The mobile phone technology is consist of RF radiation with transmission of microwaves carrying frequencies between 880 and 1800 Mega Hertz (MHz) [6]. There is an increasing number of cell phone users all over the world and the question is whether Micro Wave (MW) of these instruments could cause health hazards [7-11]. Moreover, new technologies, which use the spectrum of high frequency emissions, are incorporated in many aspects of telecommunications. As a consequence, there is a lot of interest about the possible effects of the radiation emitted from the cell phones which are engaged in the telephony [12-14].

Many studies have been performed with the aim of setting up suitable "in vitro" or "in vivo" tests capable of assessing biological effects induced by cell phones radiation [9, 10, 15-21]. From another point of view, many studies have been carried out or are in progress about the various effects of radiation emissions in regarding to the behavior, cancer, central nervous system, sleep, children, cardiovascular system, immune function, reproduction and development [9-11, 19-22]. Nittby et al. have investigated that mobile phone exposure affects the mammalian blood–brain barrier permeability 7 days after exposure to the radiation from a 900 MHz global systems for mobile (GSM) communications [23, 24]. Hinrikus et al. have shown that, the human brain EEG beta rhythms energies were increased by exposure to 450 MHz MW [25]. Lai et al. investigated the effects of microwave exposure on cholinergic systems in rat brain showing that, it is possible to establish a dose–response relationship for each brain region when different microwave power densities are used [26, 27]. Recent experimental studies in mice have shown that exposure to EMF led to significant testicular germ cell apoptosis and morphological changes [28-30]. Lu et al, have found that household use of air conditioners, which generate significant amounts of EMF, has been associated with low semen quality [31].

This paper presents a review on recent findings of our research team on the effects of cell phones radiation on human serum chorionic gonadotropin (hCG), ferritin and triiodothronine (T3) levels.

1.1. Human Chorionic Gonadotropin (hCG)

Human chorionic Gonadotropin (hCG) is a glycoprotein with approximately 9% of sialic acid and 30% carbohydrate. Serum hCG appears early during pregnancy and its concentrations increases gradually by reaching a peak at the end of the first trimester, after which it progressively decreases until delivery. It is secreted during pregnancy by syncytiotrophoblast cells of the placenta. Chorionic Gonadotropin testing constitutes an important tool for monitoring pregnancy, especially during the first trimester. In fact, during this period it is important to perform serial determinations to find out if there is a threatened abortion [32-37].

Human chorionic Gonadotropin level can easily be tested in "in vitro" preparations using a spectrophotometer, and thus, it provides a suitable model system to study the influence of RF emission on chorionic Gonadotropin [38-43].

Shahbazi et al, investigated the effects of cell phones radiation on hCG hormone levels in assays in laboratory [13]. They found that radiation exposure from mobile phones altered the measured serum levels especially in the wells with 100, 250, 500 mIU/mL hormone concentrations. Moreover, their results showed that exposure at 1.09 W/kg SAR caused a significant loss compared to 0.69 W/kg SAR exposure. They concluded that, the microwave exposures may require attention in laboratories using immunoassays.

1.2. Human Ferritin

Iron (Fe) is an essential micronutrient in biological systems and plays an important role in several cellular processes, such as adenosine triphosphate (ATP), deoxyribonucleic acid (DNA), and neurotransmitter synthesis [44]. Tissue iron is stored inside a porous protein capsule called ferritin [45-47]. Ferritin is a macromolecule and is responsible for the long term iron storage function mainly in the liver, spleen, and bone marrow [37, 48-52]. Many diseases are associated with iron overload or iron deficiency. Determination of ferritin is a suitable method for ascertaining the iron metabolism situation which provides a representative measure of body's iron reserves [53]. For determination of ferritin, human serum is labeled with ruthenium to form a sandwich complex based on an immunoassay technique [53, 54].

Fattahi et al, showed that human serum ferritin level could be interfered by the exposure to the cell phones [55, 56]. Their results demonstrated that, human serum wells in the exposed batch showed a significant decrease in serum ferritin relative to the control batch ($P = 0.029$). The average ± SD ferritin level in the exposed batch was 84.94 ± 1.04 µg/L while it was 87.25 ± 0.83 µg/L for the unexposed batch. They stated, "radiofrequency electromagnetic waves emitted from cell phones may lead to oxidative stress and rapid diffusion of the human ferritin level in an *in vitro* enzymun assay. Also, the enzyme activity can be affected."

1.3. Human Triiodothronine (T3)

Thyroid activity is regulated by the TSH secreted by pituitary. Elevated TSH levels induce the thyroid to elaborate T3 and thyroxin T4, a hormone which functions in at least 20 enzyme systems; one of its major influences involves the acceleration of protein synthesis. T3 is the hormone principally responsible for the development of the effects of the thyroid hormones on the various target organs [32, 33, 57-60]. Accordingly, the T3 concentration in serum is more a reflection of the functional state of the peripheral tissue than the secretory performance of the thyroid gland [61]. A reduction in the conversion of T3 results in a decrease in the T3 concentration. The determination of T3 is utilized in the diagnosis of T3-hyperthyrodism and for the detection of early stages of hyperthyroidism [61].

Fattahi et al, showed that mobile phone radiation did not affect the T3 levels in human serum. In other words, radiation exposure from mobile phone did not alter the serum T3 levels in the exposed wells [62]. In their experiment, the final average ± SD of T3 level in the control and exposed group was 4.93 ± 0.34 and 4.55 ± 0.53 µg/L, respectively. Fattahi et al, concluded that, although there was no significant difference in serum T3 in the exposed group compared to the control, but, more accurate follow up studies are needed for the evaluation of the effects of the mobile phone use.

2. Discussion

Recent findings showed that, human serum hCG and ferritin levels labeled with ruthenium were affected following mobile phones exposure [63-67]. The reason could be due to oxidative stress and rapid diffusion at high electromagnetic irradiation and field caused by mobile phone. Moreover, the enzyme activity can be affected [68-70].

Microwaves can affect the serum components by a MW specific, non-thermal action, and a thermal molecular effect, or a combination of these mechanisms [22, 41-43, 71, 72]. However, it is

commonly accepted that MW emitted by mobile phones is at a non-thermal power density level [47-53].

It has been shown that RF fields at 300 MHz to several GHz, at which significant local and non-uniform absorption occurs, induce torques on molecules that can result in displacement of ions from unperturbed positions, vibrations in bound charges (both electrons and ions), and rotation and reorientation of dipolar molecules such as water [3].

The recent findings presented here were in a good agreement with previously published literature [31-33]. Diem et al, reported DNA single- and double-strand induced breaks due to 1800 MHz RF-EMF exposure at 1.2 W/kg SAR [73]. Ammari et al. investigated the effects of a chronic GSM 900 MHz exposure on glia in the rat brain. They have concluded that chronic exposure to 900 MHz MW may induce persistent astroglia activation in the rat [74]. Barteri et al. studied the in-vitro interaction between RF radiation and proteins of different species. They have demonstrated that mobile phone exposure affects the structural and biochemical characteristics of an important CNS enzyme [75]. Nittby et al. have investigated that albumin extravasation enhanced in the rats which were exposed to mobile phones at 12 mW/kg SAR [23].

Recently, it is stated that, mobile phone radiation exposure does not alter the serum T3 levels in human serum. This result is in agreement with some previous studies that have found no significant EMF effects. Gurisik et al. showed no significant differences between sham-exposed and RF-exposed cells in any of the assays or conditions examined [76]. Lee et al. reported that 1763 MHz RF radiation alone did not elicit any stress response [77]. Lantow et al. demonstrated that RF-EMF exposure of human monocytes and lymphocytes did not have any activating capacity to induce hsp70 expression [78].

It should be noted that since each laboratory has its own conditions and instruments, results obtained in individual laboratories may differ from each other [38, 40, 50, 52, 79]. Considering immunoenzymometric assay in studies presented above, it has been reported that repeatability and precision of the results by using different test methods and analyzers may varied from 1.9% and 2.7% to 3.0% and 4.4%, respectively [39].

More accurate follow up studies are needed for the evaluation of the effects of the mobile phone use. The effects of mobile phones radiation should be confirmed in in-vivo situation and in larger series, employing repeated exposure-dose related effect design and providing a detailed assessment of RF radiation produced by the phones. However, still many of the related studies, in the field of mobile phone biological effects, are flawed by inconsistencies in exposure models, cell types used and the independent reproducibility of the findings.

3. Conclusions

Mobile phone radiation causes profound changes in the measured hCG and ferritin levels in immunoassays in laboratory. However, it does not affect T3 hormone in an in-vitro immunoassay under the conditions used. Further in-vivo studies on mammalians are suggested, in order to evaluate the possible effects of mobile phones radiation.

Corresponding Author:
Prof. Hamid Nasri
Professor of Clinical Nephropathology
Department of Nephrology
Division of Nephropathology
Isfahan University of Medical Sciences
Isfahan, Iran
hamidnasri@yahoo.com

References

1. Roosli M, Hug K. Wireless communication fields and non-specific symptoms of ill health: a literature review. Wiener medizinische Wochenschrift. 2011;161(9-10):240-50.
2. Fattahi-asl J, Baradaran-Ghahfarokhi M, Mojtaba Karbalae, Baradaran-Ghahfarokhi M, Baradaran-Ghahfarokhi HR. Effects of Radiofrequency Radiation on Human Ferritin: An In-Vitro Enzymun Assay. J Med Signals Sens. 2012;2(4):102-17.
3. Repacholi MH. Health risks from the use of mobile phones. Toxicol Lett. 2001;120(1-3):323-31.
4. Shahbazi-Gahrouei D, Baradaran-Ghahfarokhi M. Assessment of entrance surface dose and health risk from common radiology examinations in Iran. Radiat Prot Dosimetry. 2013;154(3):308-13.
5. Shahbazi-Gahrouei D, Karbalae M, Moradi HA, Baradaran-Ghahfarokhi M. Health effects of living near mobile phone base transceiver station (BTS) antennae: a report from Isfahan, Iran. Electromagn Biol Med. 2013. (DOI:10.3109/15368378.2013.801352).
6. Valberg PA, van Deventer TE, Repacholi MH. Workgroup report: base stations and wireless networks-radiofrequency (RF) exposures and health consequences. Environ Health Perspect. 2007;115(3):416-24.
7. Dasdag S, Zulkuf Akdag M, Aksen F, Yilmaz F, Bashan M, Mutlu Dasdag M, et al. Whole body exposure of rats to microwaves emitted from a

cell phone does not affect the testes. Bioelectromagnetics. 2003;24(3):182-8.
8. Akdag M, Elik M, Ketani A, Nergiz Y, Deniz M, Dasdag S. Effect of chronic low-intensity microwave radiation on sperm count, sperm morphology, and testicular and epididymal tissues of rats. Electromagnetobiology. 1999;18:133-45.
9. Baradaran A. Primary hyperparathyroidism and kidney; recent findings. J Parathyr Dis. 2014;2(1):5-6.
10. Hajivandi A, Amiri M. World Kidney Day 2014: Kidney disease and elderly. J Parathyr Dis. 2014;2(1):3-4.
11. Nasri H. The awareness of chronic kidney disease and aging; the focus of world kidney day in 2014. J Nephropharmacol. 2014;3(1):1-2.
12. Pourlis AF. Reproductive and developmental effects of EMF in vertebrate animal models. Pathophysiology. 2009;16(2-3):179-89.
13. Shahbazi-Gahrouei D, Mortazavi SM, Nasri H, Baradaran A, Baradaran-Ghahfarokhi M, Baradaran-Ghahfarokhi HR. Mobile phone radiation interferes laboratory immunoenzymometric assays: Example chorionic gonadotropin assays. Pathophysiology. 2012;19(1):43-7.
14. Shokrani P, Baradaran-Ghahfarokhi M, Zadeh MK. A novel approach in electron beam radiation therapy of lips carcinoma: a Monte Carlo study. Med Phys. 2013;40(4):041720.
15. Saunders RD, Kowalczuc CI, Sienkiewicz ZJ. Biological effects of exposure to non-ionizing electromagnetic fields and radiation, Radiofrequency and microwave radiation. National Radiological Protection Board, Chilton, NRPB-R240, HMSO, London. 1991.
16. Mosleh-Shirazi MA, Hadad K, Faghihi R, Baradaran-Ghahfarokhi M, Naghshnezhad Z, Meigooni AS. EchoSeed Model 6733 Iodine-125 brachytherapy source: improved dosimetric characterization using the MCNP5 Monte Carlo code. Med Phys. 2012;39(8):4653-9.
17. Ali Alavian-Ghavanini, Aminollah Bahaodini, Ehsan Salimi. The effect of whole body gamma irradiation on nitric oxide pathway of rat's aorta. J Radiobiol. 2014;1(1):9-13 (doi: 10.15171/jrb.2014.03).
18. Baradaran-Ghahfarokhi M. Normal tissue complication probability modeling of radiation-induced bladder complications. J Radiobiol. 2014;1(1):19-20 (doi: 10.15171/jrb.2014.06).
19. Asgari A. Herbal medicines and kidney; friends or foes? J Nephropharmacol. 2014;3(1):5-6.
20. Rafieian-Kopaei M, Nasri H. Vitamin D therapy in diabetic kidney disease. J Nephropharmacol. 2014;3(1):3-4.
21. Tavakoli M. Kidney protective effects of melatonin. J Nephropharmacol. 2014;3(1):7-8.
22. Ardalan MR, Sanadgol H, Nasri H, Baradaran A, Tamadon MR, Rafieian-Kopaei R. Vitamin D therapy in diabetic kidney disease; current knowledge on a public health problem. J Parathyr Dis. 2014;2(1):15-17.
23. Nittby H, Brun A, Eberhardt J, Malmgren L, Persson BR, Salford LG. Increased blood-brain barrier permeability in mammalian brain 7 days after exposure to the radiation from a GSM-900 mobile phone. Pathophysiology. 2009;16(2-3):103-12.
24. Nasri H. Journal of Radiobiology: A need of the hour. J Radiobiol. 2014;1(1):1-2 (DOI: 10.15171/jrb.2014.01).
25. Hinrikus H, Bachmann M, Lass J, Karai D, Tuulik V. Effect of low frequency modulated microwave exposure on human EEG: individual sensitivity. Bioelectromagnetics. 2008;29(7):527-38.
26. Lai H, Horita A, Chou CK, Guy AW. Low-level microwave irradiations affect central cholinergic activity in the rat. J Neurochem. 1987;48(1):40-5.
27. Lai H, Carino MA, Horita A, Guy AW. Low-level microwave irradiation and central cholinergic activity: a dose-response study. Bioelectromagnetics. 1989;10(2):203-8.
28. Lee JS, Ahn SS, Jung KC, Kim YW, Lee SK. Effects of 60 Hz electromagnetic field exposure on testicular germ cell apoptosis in mice. Asian J Androl. 2004;6(1):29-34.
29. Hong R, Liu Y, Yu YM, Hu K, Weng EQ. [Effects of extremely low frequency electromagnetic fields on male reproduction in mice]. Zhonghua Lao Dong Wei Sheng Zhi Ye Bing Za Zhi. 2003;21(5):342-5.
30. Hong R, Zhang Y, Liu Y, Weng EQ. Effects of extremely low frequency electromagnetic fields on DNA of testicular cells and sperm chromatin structure in mice. Zhonghua Lao Dong Wei Sheng Zhi Ye Bing Za Zhi. 2005;23(6):414-7.
31. Lu M, Wu J, Yang Q, Zhou W, Gao E. The effect of air-conditioner exposure on semen quality. Reprod Contracept. 2004;24(5):279-84.
32. Karimifar M. Thrombotic thrombocytopenic purpura treated with rituximab in systemic lupus erythematosus. J Renal Inj Prev. 2012;1(2):53-54.
33. Nasri H, Rafieian-Kopaei M. Association of serum vitamin D level with age in individuals

with normal renal function. J Nephropharmacol. 2012;1(1):7-9.
34. Nematbakhsh M, Ashrafi F, Safari T, Talebi A, Nasri H, Mortazavi M, et al. Administration of vitamin E and losartan as prophylaxes in cisplatin-induced nephrotoxicity model in rats. J Nephrol. 2012;25(3):410-17.
35. Nematbakhsh M, Pezeshki Z, Eshraghi-Jazi F, Ashrafi F, Nasri H, Talebi A, et al. Vitamin E, vitamin C, or losartan is not nephroprotectant against cisplatin-induced nephrotoxicity in presence of estrogen in ovariectomized rat model. Int J Nephrol. 2012;284896.
36. Nematbakhsh M, Talebi A, Nasri H, Safari T, Dolatkhah S, Ashrafi F, et al. Some evidence for sex-based differences in cisplatininduced nephrotoxicity in rats. Clinical and Experimental Medical Letters. 2012;53(1-2):29-32.
37. Ardalan MR. Parathyroid carcinoma in hemodialysis patients; it should not be diagnosed as a thyroid nodule. J Parathyr Dis. 2013;1(2):25-26.
38. Hajian S. Renoprotective effects of green tea. . J Nephropharmacol. 2013;2(2):21-22.
39. Najarian T, Rowsemitt CN. Methods and compositions for facilitating weight loss by administration of thyroid hormones. US Patent 20,130,005,814; 2013.
40. Nasri H, Mubarak M. Renal injury due to vitamin D intoxication; a case of dispensing error. J Renal Inj Prev. 2013;2:85-87.
41. Nasri H, Nematbakhsh M, Ghobadi S, Ansari R, Shahinfard N, Rafieian-Kopaei M. Preventive and curative effects of ginger extract against histopathologic changes of gentamicin-induced tubular toxicity in rats. Int J Prev Med. 2013;4(3):316-21.
42. Nematbakhsh M, Pezeshki Z, Moaeidi B-A, Eshraghi-Jazi F, Talebi A, Nasri H, et al. Protective role of silymarin and deferoxamine against iron dextran-induced renal iron deposition in male rats. Int J Prev Med. 2013;4(3):286-92.
43. Shirani M, Davoudian A, Sharifi A. Retroperitoneal fibrosis associated with propranolol: a case report; is corticosteroid administration necessary after ureterolysis? J Renal Inj Prev. 2013;2(2):67-69.
44. Kauppi B, Nielsen BB, Ramaswamy S, Larsen IK, Thelander M, Thelander L, et al. The three-dimensional structure of mammalian ribonucleotide reductase protein R2 reveals a more-accessible iron-radical site than Escherichia coli R2. J Mol Biol. 1996;262(5):706-20.
45. Clegg GA, Fitton JE, Harrison PM, Treffry A. Ferritin: molecular structure and iron-storage mechanisms. Prog Biophys Mol Biol. 1980;36(2-3):56-86.
46. Alavian-Ghavanini A, Baradaran-Ghahfarokhi M. Comment on: MTT assay instead of the clonogenic assay in measuring the response of cells to ionizing radiation. J Radiobiol. 2014;1(1):15-16 (doi: 10.15171/jrb.2014.04).
47. Safora Nikzad, Bijan Hashemi. MTT assay instead of the clonogenic assay in measuring the response of cells to ionizing radiation. J Radiobiol. 2014;1(1):3-8 (doi: 10.15171/jrb.2014.02).
48. Nasri H. Atypical presentations of the sarcoidosis with kidney involvement. J Renal Inj Prev. 2012;1(2):51-52.
49. Ardalan MR, Nasri H. Acute kidney injury; the focus of world kidney day in 2013. J Nephropharmacol. 2013;2(2):15-16.
50. Gheissari A. Acute kidney injury and renal angina. J Renal Inj Prev. 2013;2(2):33-34.
51. Hajivandi A, Amiri M. World diabetes day: diabetes mellitus and nephrology. J Nephropharmacol. 2013;2(2):31-32.
52. Nasri H. Cisplatin therapy and the problem of gender-related nephrotoxicity. J Nephropharmacol. 2013;2(2):13-14.
53. Jacobs A, Hodgetts J, Hoy T. Ferritins and isoferritins as biochemical markers. Elsevier, Amsterdam 1984:113-27.
54. Shahbazi-Gahrouei D. Radiobiological modeling in radiation oncology. J Radiobiol. 2014;1(1):17-18 (doi: 10.15171/jrb.2014.05).
55. Fattahi-Asl J, Baradaran-Ghahfarokhi M, Karbalae M, Baradaran-Ghahfarokhi HR, Haghighizadeh MH. Diagnostic performance of the human serum ferritin level decreased due to mobile phone exposure. J Res Med Sci. 2013;18(1):84.
56. Fattahi-Asl J, Baradaran-Ghahfarokhi M, Karbalae M, Baradaran-Ghahfarokhi M, Baradaran-Ghahfarokhi HR. Effects of radiofrequency radiation on human ferritin: an in vitro enzymun assay. J Med Signals Sens. 2012;2(4):235-40.
57. Ashrafi F, Haghshenas S, Nematbakhsh M, Nasri H, Talebi A, Eshraghi-Jazi F, et al. The role of magnesium supplementation in cisplatin-induced nephrotoxicity in a rat model: No nephroprotectant effect. Int J Prev Med. 2012;3(9):637-43.
58. Baradaran A. Antiphospholipid syndrome-associated nephropathy; a nephropathy needs classification. J Nephropharmacol. 2012;1(1):9-11.

59. Baradaran-Ghahfarokhi M. Radiation-induced kidney injury. J Renal Inj Prev. 2012;1(2):49-50.
60. Gheshlaghi F. Toxic renal injury at a glance. J Renal Inj Prev. 2012;1(1):15-16.
61. Klee G. Clinical usage recommendations and analytic performance goals for total and free triiodothronine measurements. Clinical Chemistry 1996;42:155-59.
62. Jafar Fattahi-asl, Mojtaba Karbalae, Molood Baradaran-Ghahfarokhi, Hamidreza Baradaran-Ghahfarokhi, Rasha Khajoei-Fard, Mitra Karbalae, et al. Radiofrequency Radiation and Human Triiodothronine Hormone: Immunoenzymometric Assay. Recent Patents on Biomarkers. 2013;3(3):213-18.
63. Al-Murrani S, Gao X. Compositions and methods for diagnosing and monitoring hyperthyroidism in a feline. WO Patent App. PCT/US2012/042,534; 2012.
64. Nasri H, Baradaran A. Correlation of serum magnesium with dyslipidemia in maintenance hemodialysis patients. Acta medica (Hradec Kralove) / Universitas Carolina, Facultas Medica Hradec Kralove. 2004;47 (4):263-65.
65. Nasri H. Serum C-reactive protein (CRP) in association with various nutritional parameters in maintenance hemodialysis patients. Bratislavské lekárske listy. 2005;106(12):390-95.
66. Baradaran A, Nasri H. Correlation of serum magnesium with serum parathormone levels in patients on regular hemodialysis. Saudi journal of kidney diseases and transplantation. 2006;17(3):344-50.
67. Nasri H, Yazdani M. The relationship between serum LDL-cholesterol, HDL-cholesterol and systolic blood pressure in patients with type 2 diabetes. Kardiologia Polska. 2006;64(12):1364-68.
68. Rouhi H, Ganji F, Nasri H. Effects of ginger on the improvement of asthma [The evaluation of its' treatmental effects]. Pakistan Journal of Nutrition. 2006;5(4):373-76.
69. Nasri H, Baradaran A. The influence of serum 25-hydroxy vitamin D levels on Helicobacter Pylori Infections in patients with end-stage renal failure on regular hemodialysis. Saudi journal of kidney diseases and transplantation. 2007;18 (2):215-19.
70. Nasri H, Baradaran H-R. Lipids in association with serum magnesium in diabetes mellitus patients. Bratislava Medical Journal. 2008;109(7):302-06.
71. Spasovski D. Renal markers for assessment of renal tubular and glomerular dysfunction. J Nephropharmacol. 2013;2(2):23-25.
72. Tamadon MR, Ardalan MR, Nasri H. World Kidney Day 2013; acute renal injury; a global health warning. J Parathyr Dis. 2013;1(2):27-28.
73. Diem E, Schwarz C, Adlkofer F, Jahn O, Rudiger H. Non-thermal DNA breakage by mobile-phone radiation (1800 MHz) in human fibroblasts and in transformed GFSH-R17 rat granulosa cells in vitro. Mutat Res. 2005;583(2):178-83.
74. Ammari M, Brillaud E, Gamez C, Lecomte A, Sakly M, Abdelmelek H, et al. Effect of a chronic GSM 900 MHz exposure on glia in the rat brain. Biomed Pharmacother. 2008;62(4):273-81.
75. Barteri M, Pala A, Rotella S. Structural and kinetic effects of mobile phone microwaves on acetylcholinesterase activity. Biophys Chem. 2005;113(3):245-53.
76. Gurisik E, Warton K, Martin DK, Valenzuela SM. An in vitro study of the effects of exposure to a GSM signal in two human cell lines: monocytic U937 and neuroblastoma SK-N-SH. Cell Biol Int. 2006;30(10):793-9.
77. Lee JS, Huang TQ, Kim TH, Kim JY, Kim HJ, Pack JK, et al. Radiofrequency radiation does not induce stress response in human T-lymphocytes and rat primary astrocytes. Bioelectromagnetics. 2006;27(7):578-88.
78. Lantow M, Lupke M, Frahm J, Mattsson M, Kuster N, Simko M. ROS release and Hsp70 expression after exposure to 1,800 MHz radiofrequency electromagnetic fields in primary human monocytes and lymphocytes. Radiat Environ Biophys. 2006;45:55-62.
79. Mardani S, Nasri P, Tavakoli M. Contrast induced nephropathy; recent findings. J Nephropharmacol. 2013;2(2):27-30.

3/21/2021