The Impact Of Electromagnetic Radiation (EMR) On The Human's Health.

[1]Mr.Waghamare. A.D, [2]Mr. Dr. Kolhe S. D [3]Pawar Sarika, . [4]Pawar Daiwashala,
Designation: *[1]Assistant professor (Department of pharmaceutical Analysis) Anand charitable Sanstha's college of pharmaceutical Science and Research Centre, Ashti, India
[2]Principle, Anand Charitable Sanstha's College of Pharmaceutical Science and Research [3,4]Student of Bachelor Of Pharmacy, ACS'S College Of Pharmaceutical Science And Research Center, Ashti ,India.
Name of Organization: [*1] Anand charitable Sanstha's college of pharmaceutical Science and Research Centre, Ashti, Dist. Beed, Maharashtra, India

ABSTRACT: Electromagnetic radiation is a type of energy that arises when electrical and magnetic waves interact, resulting in energy packets referred to as pictures. The potential of electromagnetic radiation can be enhanced through transference lines that are extremely close to human life. Electromagnetic waves can be divided into two types: ionizing and non-ionizing. It has the same effect on human health as ratio waves, micro waves, infrared visible light, ultra violet, X-rays, and gamma rays electromagnetic radiation. Is one of the world's finest treats? The current paper recognizes that the exhibition of electromagnetic radiation may pose a health risk to humans. This is the primary consequence of the radio frequency electromagnetic field stored with extremely bodily tissue. The spectrum is an array of frequency, wavelength, and photon ranges. Spectrum is a ranges of frequency, wavelength and photons energies caused frequency from the below 1 Hz to above 10^{25}Hz.

Key words: Electromagnetic Radiation, Ionization, Non- ionization, X-rays, Gamma rays, Human health

INTRODUCTION

The Complete world is near by the electromagnetic radiation. From 1888 the electromagnetic fields (EMFs) are present in connecting the human region. Electromagnetic radiation Consist of two types depending on there are efficient of ionizing molecule and breaking ionic bonds. The electromagnetic fields are potential and dangerous effects on the human body these electromagnetic radiation are a make reference to the waves. Radiation is consisting of the electrical field on the various magnitude directions and perpendicular direction radiation is traveling by a magnetic field and electrical field[1]. In electromagnetic radiation is used in the range of electromagnetic spectrum and to study the Earth, and Solar system the electromagnetic radiation Consist of following two types.

IONIZING RADIATION:

Ionizing radiation is from of energy this is removing of electrons from of the atoms and molecules. The material is including air, water and living tissue is known as ionizing radiation example of ionizing radiation is high energy ultraviolet radiation[2]. X-rays and Gamma rays such as particular include in Alpha particular ultraviolet and Beta particles of electron. Ionizing radiation including nuclear radiation consists of subatomic particles they are sufficient energy to ionizing radiation[3].

NON- IONIZING RADIATION:

Non - ionizing radiation is described as a energy of waves of composed oscillating electric and magnetic fields. Non- ionizing radiation effects of human body it does cause atoms to vibrate, which causes to heat up. Type of non - ionizing radiation is included in (UV), visible light, infrared (IR), microwave ratio frequency (RF) and extremely low frequency (ELF) there are microwave and radio frequency discharge in the wireless

telecommunications devices such as wireless and telephone. The ionizing radiation is originated from sources such as sunlight, lightning discharge[4].

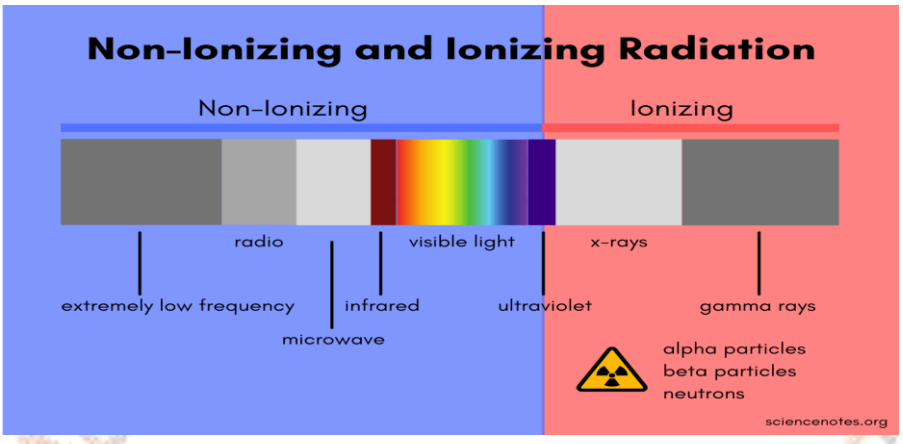

Figure No. 1: Ionization and Non- Ionization Radiation

ELECTROMAGNETIC SPECTRUM:

These are electromagnetic spectrum is Consist of all frequency is a electromagnetic radiation that is pass on energy to be transmitted l through the extent of the waves the electromagnetic waves consist of is electric and magnetic fields. The electromagnetic spectrum Consist of the radio waves, microwave, infrared waves, ultraviolet waves, Visible light waves, X-rays waves and Gamma rays[5].

Radio Waves: Radio waves are the type of electromagnetic radiation with the longest wavelength is electromagnetic spectrum frequency of the 300 (GHZ) and below at 300 GHZ. Used in many devices such as the Remote control, cell phones, wireless devices[6].

Microwave: these are microwaves which is similar to the radio waves. Used for Communication radio astronomy, remote sensing, radar and the course to their heating of the application[7].

Infrared waves: Infrared light is a part of the Electromagnetic spectrum. People come into contact with infrared light every day. The human eyes cannot see it, but humans can expose it as heat. Infrared (IR) has wavelength \between 780nm and 1mm, which is the corresponding of frequency ranges from the 300 GHz to 400 THz[8]. Example of infrared light remote control, optical fibers, thermal Imaging cameras, infrared cookers, electrical heaters, infrared Lamps.

Ultraviolet light: Has a wavelength between 10 and 400 nm that is shorter than the visible light other than longer than. The X-rays and is a types of electromagnetic radiation[9].

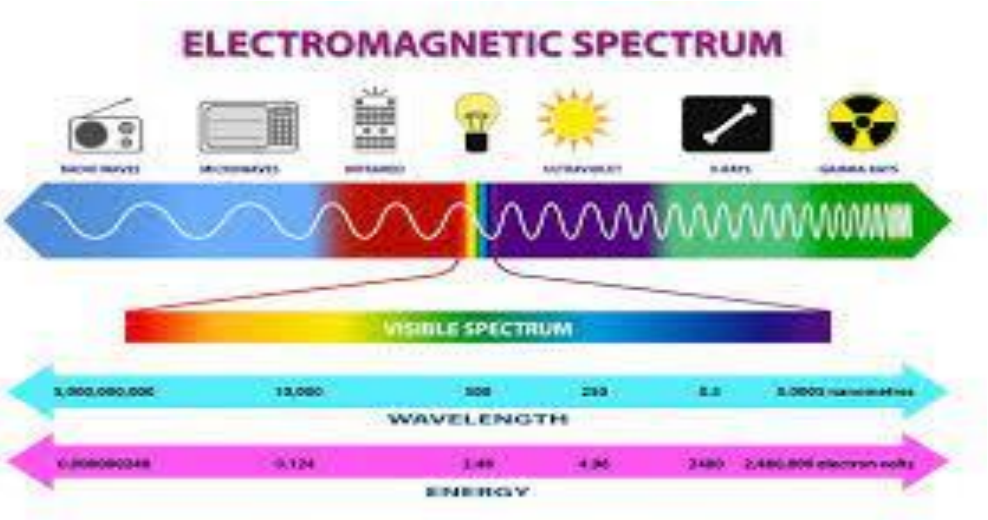

Figure No 2. Electromagnetic Spectrum

Effect of the electromagnetic radiation on the human health -

Cancer: cancer was first associated with exposure to electromagnetic fields (EMF) in 1979 when Wertheimer and leaper noticed that children death from cancer resided more found in homes believed to be exposed to more (EMF) than did healthy children.

Data are of two types of cancer (1) Epidemiologic observation concerning the occurrence of children's and adult cancers under different residential and occupational exposure conditions. (2) Experimental study's seeking reproducible event of carcinogenic effect from (EMF) in cells tissue and animals.

Treatment of cancer by electromagnetic Radiation:

1) X-rays

2) Gamma rays

3) Ultraviolet rays

1) X- rays: X-rays are a type of light that cannot be seen by human the way blue and red light can. Due to their high energy x-rays can is penetrated deeply into or even go right through human bodies. Are transparent to visible light, most parts of the human body are transparent to X- rays[10].

Figure No 3: X-rays

2) Gamma rays: gamma rays also known as gamma radiation is a penetrating form a electromagnetic radiation, arising from the radioactive decay of atomic nucleic[11]

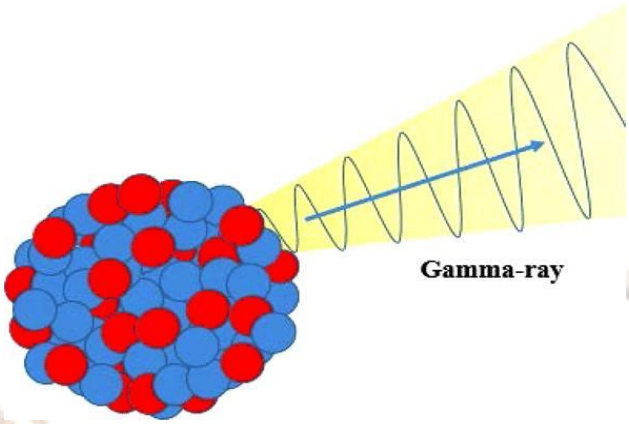

Figure No 4: Gamma rays

l2) Ultraviolet rays: Ultraviolet radiation is a form of non-ionizing radiation that is emitted by the sun and artificial sources such as [12]

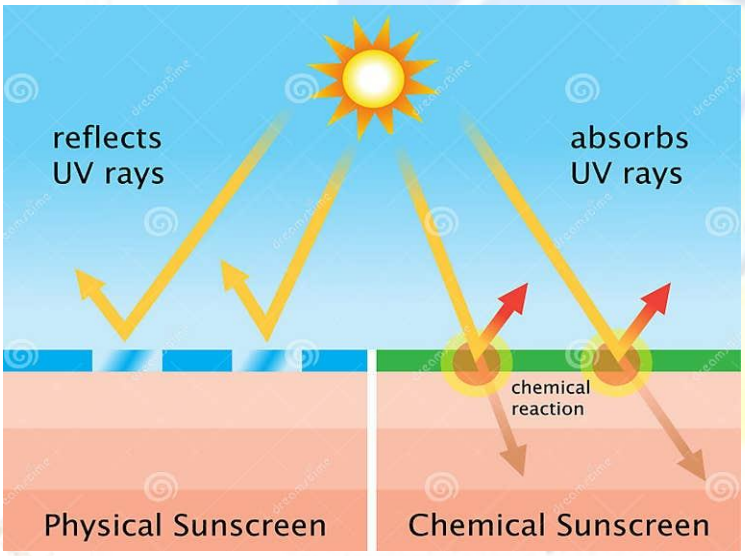

Figure No. 5: Ultraviolet Rays

Dangerous results of EMF sources:

Due to the common use of cell telephones, they have got a unique area in EMF studies. The results of mobile phones on the human body can be categorized as thermal and non-thermal effect Computer video display units generate EMF between the frequencies of zero and 1015 Hz. current findings indicate that cathode ray tube (CRT) video display units have high hazard, even as Liquid crystal show (liquid crystal display) video display units has less EMF technology. Measurements imply that with distance from the display EMF loses its energy[13].one of the critical sources for the EMF generation that raises attention is microwave ovens. They're completely normally encountered home equipment, due to the fact that they're very realistic. Even though they've internal safety mechanism they still present a hazard aspect.

The places which can be in touch with the system maximum of the time are the top and the neck areas. consequently the gap of the mobile smart phone from the eye and the ear has a amazing important one of the most important hearing issues that is precipitated by cell telephones is the acoustic neurinomal[14].

EMF and testis: Inside the human frame there are organs which have low thermoregulation this type of organs is the testes of fellows. The initial outcomes of the research conducted thus far have shown signs of oligospermia in guys. In a recent study via dasdag and his colleagues 1999, confirmed that the rats that are exposed to mobile phones that are in use display histological changes in their testis's and their rectal temperatures are statistically higher in comparison to ordinary rats[15].

EMF and kidney:

The studies regarding the effects of cellular phones on kidneys show that cortical renal tubular epithelium is affected more than the medullar tubules.

EMF and skin:

Human pores and skin, alternatively, emerges as a shielding barrier towards the dangerous outcomes of the cellular phones. However, there are studies that file there is probably adjustments even on the pores and skin due to the outcomes of the mobile telephones.

EMF and brain:

Human mind is a shape that features with strength consequently an electromagnetic area can immediately affect the function of the brain. it can also be assumed that the electromagnetic discipline as a result of wi-fi verbal exchange along with cell phones may have an effect on many mind features. Mechanism can be associated with the increase of chemical substances, known as the free radicals, inside the mind within the presence of electromagnetic area over ordinary tiers[16].

EMF and neurological illnesses:

DNA harm can purpose diseases that affect the fearful machine or result in the development of those diseases. One of the distinctive functions of neuron cells that separate them from the opposite cells is the reality that they cannot divide. DNA harm in cells that perform mobile division can motive the occurrence of cancerous cells. But since the neuron cells cannot divide the harm in the neuron mobile DNA broadly speaking affects the characteristic of the cells or reasons deaths of the cells. On the opposite hand glial cells which can be the guide tissue of nervous systems can divide therefore DNA damage in these regions can reasons Cancer.

ELECTROMAGNETIC RADIATION SOURCES:

The subsequent electrical appliances are the main drivers of electromagnetic radiation.

1. Electrical home equipment

2. Digital system

3. Computer systems and associated gadget

4. Cellular phone masts

5. Microwave ovens

6. Residence-wiring

7. Cell (cell) telephones

8. Information networks

9. Different voltage level power lines.

Materials AND method

A. Electromagnetic Field:

Electromagnetic fields arise whilst electric and magnetic fields that are various with recognize to time come collectively. as the frequency will increase, the wavelength decreases and the power emitted in the subject increases. Electric and magnetic fields which can be static are certainly arise in nature. The natural magnetic subject is located inside the north-south course across the earth's sphere and consists of undulating waves that help birds and fish to navigate. The herbal electric field is come by means of lightning in neighborhood part of the environment Electromagnetic fields that are emitted from man-made assets in addition to natural electric and magnetic fields[17].

B. Electromagnetic Radiation:

EM radiation is specially divided into two elements as ionizing and non-ionizing radiation. Ionizing Radiation is EM wave with high frequency (better than 1014 Hz) which Have capability to ionize atomic bonds in cellular molecules. For example, X-ray and gamma rays and some resources of ultraviolet (UV) rays are assessed on this class. Immoderate publicity to this impact can result in hazardous situations which include damage to living cells and also DNA chain.

C. Electromagnetic Spectrum:

The electromagnetic spectrum is a chain containing all recognized electromagnetic waves from gamma rays to radio waves. It's far shown within the electromagnetic waves vary with wave duration or frequency within the spectrum. The very best frequency waves have the greatest power[18].

D. Electromagnetic area sources:

Some EM resources that seem in every day existence are as follows;

 Terrestrial television and radio pronounce AM, FM, television

 Communique Announces: Telecom, satellite, GPS, radar

 Energy distribution: electricity transmission lines, electric trains

 High voltage lines

 Excessive frequency commercial, medical and studies device: X-Ray, heaters

Electrically operated gadgets create electromagnetic fields in their environment. Microwave ovens, washing machines, vacuum cleaners, hair dryers, water warmers and all electrical family appliances create electromagnetic fields.

CONCLUSION: Electromagnetic radiation (EMR) is exposure at the highest frequency (x-rays, gamma rays, ultraviolet rays) is a source of serious biological damage Electromagnetic field radiation and their effects on human health Especially electromagnetic field impact of high voltage that is exposure from high voltage transmission. The purpose of current study was to give more knowledge about electromagnetic radiation effects on our life. Already discuss about some fatal problems there are two categories ionizing radiation and non-ionizing radiation Most of the negative impacts are especially in the spectrum of radio frequency band which is wireless communications.

REFERENCE:

1. Clouded, Shane (1995). An Introduction to Electromagnetic Wave Propagation and Antennas. Springer Science and Business Media. pp. 28–33. ISBN 978-0387915012.
2. "Ionizing radiation, health effects and protective measures" world Health Organization. 29 April 2016. Archived from the original on 29 March 2020. Retrieved 22 January 2020.
3. S.Mukhopadhyay and A. Sanyal, "A review of the effects of non-ionizing electromagnetic radiation on human body and exposure standards," 1997, pp. 279-288.
4. Feyyaz Ozdemir and Aysegul Kargi Submitted: October 9th 2010Reviewed: May 10th 2011Published: June 21st 2011DOI: 10.5772/16343.
5. D. A. Larrabee, "Teaching Electromagnetic Radiation effects on Humans," 2006, pp. 52-56.
6. “Opinion on Possible Effects of Electromagnetic Fields (EMF)Radio Frequency Fields (RF) and Microwave Radiation on Human Health,” Scientific Committee on Toxicity,Ecotoxicity and the Environment (CSTEE).
7. J. Zhu, Q. Zhao, Y. Yao, S. Luo, X. Guo, X. Zhang, Y. Zeng, and K. Yan, "Effects of high-voltage power sources on fine particle collection efficiency with an industrial electrostatic precipitator," Journal of Electrostatics, 2011.
8. Arnetz BB, Berg MJ. 1996. Melatonin and adrenocorticotropic hormone levels in video display unit workers during work and leisure. Occup Environ Med. 38: 1108-1110.
9. Hao, Q., Wenfang, C., Xia, A., Qiang, W., Ying, L., Kun, Z., & Runguang, S. (2011). Effects of a moderate-intensity static magnetic field and adriamycin on K562 cells. Bioelectromagnetics, Vol. 32, No. 3 (April 2011), pp. 191-199, ISSN 1521-186X
10. Mats-of Mattsson, Anders Ahlbom, Karolinska Institutet, Possible effects of Electromagnetic Fields (EMF) on Human Health. Scientific Committee On Emerging And Newly Identified Health Risks (SCENIHR) 19 July 2006 MRI: Magnetic Resonance Imaging
11. Khan ARI Zaman NI juzafar SK Health hazards linked to using mobile cellular phones. J Infor Com Tech 2008; 2: 101-108.
12. Azizi MS, Mohamad NR, Salleh A, Othman A, Aris Asane, as N. Ultra-Wideband (UWB) antenna radiation on action potentials in human nerve fibers. J Telecom Elec Comp Eng 2017; 9: 59-64.
13. Cameron IW, Hardman WE, Winters WD, Zimmerman S, Zimmerman AM. 1993. Environmental Magnetic Fields: Influences on Early Embryogenesis. J.Cell Biochem. 51: 417-425.
14. Salahaldin AH, Bener A. 2006. Long-term and frequent cellular phone use and risk of acoustic neuroma. Int Tinnitus J. 12(2): 145-148.
15. Deepinder F, Makker K, Agarwal A. 2007. Cell phones and male infertility: dissecting the relationship. Reprod Biomed Online. 15: 266-270.
16. Ozguner F, Aydin G, Mollaoglu H, Gokalp O, Koyu A, Cesur G. 2004. Prevention of mobile phone induced skin tissue changes by melatonin in rat: an experimental study. Toxicol Ind Health. 20: 133-139.
17. Derya Gürğan, Levent Seyfi, Determination and Analysis of Electromagnetic Pollution at Two Shopping malls in Konya at 100 kHz-3 GHz Frequency, International Journal of Environmental Science and Development (IJESD), Vol. 9, No:9, September 2018, pp. 266-269.
18. Sema Palamutçu, Nermin Dağ, Fonksiyonel tekstiller I: Elektromanyetik kalkanlama amaçlıtekstil yüzeyleri, Tekstil Teknolojileri Elektronik Dergisi, Cilt: 3, No: 1(87-101),2009