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Effects of Microwaves and Electromagnetic Radiations on Teenagers

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ABSTRACT

This paper has been devoted to the study of Effects of Microwaves and Electromagnetic Radiations on Teenagers. In this paper we have studied the effects of microwaves (MW) and electromagnetic radiations (EMR) on young children i.e. teenagers of India. While using a cell phone some of the energy of electromagnetic field is converted into heat. The extent of this conversion takes place depends upon electromagnetic property of the tissue.

Keywords: Microwaves and Electromagnetic Radiations, Teenagers.

I. INTRODUCTION

The planet earth is in our palm today in many ways and mobile phone is one of the associates of global togetherness. The environment is tolerating and paying heavy prices for all the development in some cases. Microwaves have a very high frequency and energy these waves travel longer (one used in GSM technology). The operating frequency range is 900-1800 MHz. The other side of the coin probably has an adverse consequence. In countries like India where the percentage population of young people is more, the hazards of MW and EMR pollution have to be very carefully studied. Fastest growing group of mobile phone users are children and young people. This growth is encouraged by professional advertising. The metabolic rate in young and growing children is faster than adults. In current paper various aspects of exposures like cell growth change at higher frequency, effect on blood brain barrier, reports of brain cell damage and restlessness in infant at high frequency radiation have been discussed. Not only is the user but also the non user of mobile phone may be exposed to non-ionizing radiation from mobile transmission towers. The hazards of non ionizing usually ignored due to lower frequency as one used in mobile phone communications, have been presented. The absorption of these radiation by human body which changes the tissue temperature has been studied and termed as SAR (specific absorption rate). Certain precautions can definitely reduce the risk of non ionizing radiations.

II. UNSAFE RADIATIONS

The atmosphere has variety of radiation broadly divided into natural and artificial radiations enhanced by human activity. The natural radiations are taken care of naturally and show little or no variation with time. The present work focuses on microwave radiations that has risen many folds for past 30 years. One on the basic reason for this increase is the use of modern communication technology. The most common of them, the cell phone, has led to increase in exposure to microwave radiation in the society. Before going further let us understand briefly Microwave radiations. The term microwave frequency

is generally used for those wavelengths measured in 30 cm to 1 mm and 1 to 300 GHz. The cell phone operates in the frequency range of 900 to 1800 MHz. The radiations emitted are electromagnetic in nature and are non ionizing. It is not only the user of the mobile phone who may be effected but also the society around the transmitting towers may be effected by the radiation hazard due to 24 hrs emission or radiations from the towers which power billions of mobile phones world wide.

India is one of the fastest emerging economies with high percentage of young population resulting in better purchase power and business resulting in the need of faster communication. Highest number of new cellular users in the world was added in a single month in October 2006 India hits magical figure of 200 million phones making is fourth largest mobile phone consumer (Manoj Garola [5]). The present study was carried out in the densely populated cities of Gonda, which shows some planning results. The health consequences of EMR exposure vary in intensity from mild symptoms to serious diseases (Seitz, et al., 2004[8]). A pioneer to the field of Bioelectromagnetics, Dr. Robert O Becker [11], wrote the book, The Body Electric. In his book Dr. Becker claims that electromagnetic pollution is the greatest threat to our environment, greater than global wanning. The society and authorities not only in India but around the world treat low frequency electromagnetic fields have to be very intense to produce visible effects such as electric shock and bums. The non ionizing nature may make it look even safer but, there is a mistake in assuming that that extreme effects don't happen then no other effects can take place. This approach ignores the basic science of Biophysics. The basic fact that cells use oscillating electromagnetic fields for many vital functions has been overlooked. The electromagnetic pollution has gone up around 100 times in last 30 years (Hope Fauna, Dec 2006 [3]). Microwave exposure can be associated with leakage of albumin through the blood-brain-barrier as the exposure may chance the permeability of the barrier (Williams, 1984[10], Rajendra, et al.,2004[7], Johansen, 2002 [4]). The change in penne ability can result in serious damage to CNS. The most common mechanism by which electromagnetic fields interact with biological systems is by inducing motion in polar molecules. Water and other polar molecules experience a torque when an electric field is applied. The excitation of water, or other polar molecules, in the form of increased rotational energy is manifest as increased kinetic energy (elevation of temperature), but molecular structure is essentially unaltered if elevations are not excessive. Electromagnetic energy absorbed by biological material can be converted into stress by thermal expansion. This phenomenon is caused by a rapid rise of temperature either deep within or at the surface of the material, and thus creature a time-varying thermal expansion that generates elastic stress waves in the tissue.

Very young children and teenagers are becoming regular to heavy users of cell phones while their brains and bodies are in a much more vulnerable state than elderly people (Maisch, 2001 [6]). With cancer and neuro degenerative disease latencies of decades, the possible adverse effects will take some time to become evident. By which time it will be too late for thousands of people. At first, this subject may not seem relevant to children's lives until it is realized the today the fastest growing group of mobile phone users are children and young people. This growth is actively advertising campaigns from the mobile phone industry, extolling how to their life styles (Vincent, 2004 [9]).

III. METHODOLOGY

City Gonda were selected and recording were made and presented in the table given below. The recordings were made at different interval of time and repeated for six days. High frequency detector with a range of 100 MHz -8GHz and high end broad band

EMC antenna 380 MHz to 18 GH were used for the purpose both the units could be connected to computer and HF spectrum analyzer software we used to record the observations. The average power output was calculated. It is observed that most of the place recorded power output much higher than the safe exposure limit. The observed places had multiple transmit in towers mounted not only on high rise building but even on ground level. Along with this scientific observation a survey was con ducted in four north and central Indian cities on children belong in to middle class families which constitute majority of urban population.

The level of radiation was found alarming in surveyed city:

S.No.	Location	Recorded RF level (Micro watt/cm2)
1.	Bus Station	0.56
2.	Railway station	0.75
3.	Gonda	0.46
4.	Rani Bazar	0.52
5.	Bargaon	0.44
6.	Bypass	0.45
7.	LBS Chauraha	0.43
8.	Bahraich Road Kachahri	0.48

Radiant energy is recorded into human bodies according to following three methods:

(1) Aerial effect where bodies and body parts receive and absorb the RF/MW signal.

(2) The second mechanism involves the coupling of the signal to the tissue as the signal penetrates the tissue and interacts with the cells and layers of tissue.

(3) The third biophysical absorption process involves resonant absorption by biological systems in the brain and cells (Cherry, 2001 [2]).

IV. RESULTS AND DISCUSSION

In our country a mobile phone is an emotional and functional prop while children explore independence from parental supervision. Survey conducted four cities of India namely Delhi Kanpur Lucknow and Indore reveled the children of different age have different reason to support there demand for mobile phone for this purpose there, categories were taken. Children in 6-10 age group needed cell phone to play games or download various songs and picture as shown in advertisements. 11-13 years age group are more interested in there phone and that too lates available set which there parents could afford .This group is more interested in SMS, MMS and long conversation and the last group, 14-16 need cell phone for there privacy not interested in SMS but preferred to talk long both studies and other activities. Only parents of 14-16 showed concern for cell phone use by there children but not of scientific reason but just worried about there teenage and there circle.

The observation of power output is alarming in Indian cities. The study of Radiation level in the city of Gonda undoubtedly proves that this NIEMR is polluting and adversely affecting the child health (Bohler,2004 [1]) There is a primary need to control these pollutions and also to draw guidelines for the Maximum Permissibly Exposure Levels in India. The guidelines by agencies like FCC, ICNlRP, EPA and others were based on the fact the RF Energy causes only heating effect to the human tissues. Once studies of pioneering scientists like Dr. Nei Cherry [2] based on the actual medical studies came into existence, standards were red firmed first time by Dr. Cherry el al. The Non Ionizing Electromagnetic Radiations be considered as a potent polluting agent and. therefore, is dear by the Ministry dealing with Pollution Control in a way they are dealing with air. Water, and noise pollutions the health hazard has been totally overshadowed by the billion dollar and still growing corporate world of mobile. The outcome of non

ionizing radiations as in mobile phone may not be known for many years, until today's young mobile phone users are well into their adulthood and if by then the warnings of health hazards prove to be true, irreversible damage to the health of man of these individuals will have been done. The density of population and users in India make the equation more complex. There is role for both individual and government to play for the safety of the future generation. The towers emitting 24 hrs should be of lower power output at the moment there are no strict norms on the location of the towers mounted. During the survey it was observed that Mobile Telephone Companies have installed Towers almost within the area of 100 Sq. Mtr. The additive effect of the effective POW1 illumination is evident from tablel-1 in almost all localities ignoring schools and hospitals nearby. Presumably, this happened due to use of same planning case tool or due to the fact that the company which has come up later has taken previous company's planning as base.

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