PHYSIOLOGICAL HEALTH DEVIATION DUE TO VIDEO DISPLAY TERMINALS EXPOSURE.

BY

SUHEILA ABDEL-MONIEM SABRENE

(M.B. B.CH), FACULTY OF MEDICINE ,
AIN SHAMS UNIVERSITY, 1981.

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE
REQUIREMRENT FOR THE MASTER DEGREE
IN ENVIRONMENTAL SCIENCE

MEDICAL DEPARTMENT
INSTITUTE OF ENVIRONMENTAL STUDIES&RESEARCH
AIN SHAMS UNIVERSITY

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HAS BEEN APPROVED BY:

Prof. Dr. M. Salah El-Dean Moustafa
Prof. of Public Health Childhood Institute,
Ain Shams University.

Prof. Dr. Fatma Wagih Abdel Salam
Prof. of Nuclear Physics,
Nuclear Energy Association

Prof. Dr. Moustafa Hassan Ragab
Prof. of Environmental Medical Sciences,
Head of Environmental Medical Science,
Institute of Environmental Studies and Research,
Ain Shams University

Dr. Mahmoud Serry Al-Bukhary
Assistant Prof. of Environmental Medical Sciences,
Institute of Environmental Studies and Research,
Ain Shams University.

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UNDER SUPERVISION OF:

Name **Signature**

Prof. Dr. Hossni Ahmed Ismeal
Faculty of Education
Ain Shams University

Prof. Dr. Moustafa Hassan Ragab
Prof. of Environmental Medical Sciences,
Head of Environmental Medical Sciences,
Institute of Environmental Studies and Research,
Ain Shams University

Dr. Mahmoud Serry Al-Bukhary
Assistant Prof. of Environmental Medical Sciences,
Institute of Environmental Studies and Research,
Ain Shams University

2005

بِسمِ ٱللهِ ٱلرَّحمَن ٱلرَّحِيمِ

سُبْحَانكَ لاَ علمْ لَنا إلا مَا علمْتَنَا

صَدَق ٱللهِ العظيم

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2005

With

Dedication

To

The Spirit of My Mother

ABSTRACT

TI : Physiologic Health Deviations Due to Video Display Terminal exposure.

AU: Moustafa R. Ragab.; Hossni A. Ismeal.; Mahmoud S; Al-Bukhary; Suheila S.Sabrene

SO: J –Environ-Science. (10) June 2005

AB: To determine the adverse health effects of Video Display Terminals (VDTs) electromagnetic fields (EMFs) exposure in adult VDT users. VDT (EMFs) exposure has a considerable impact, related to the period and time of exposure in hours per day.

Methods: this study was carried out in period Jan 2003-July 2003 on two groups.

Comparative study between 40 Computer Science teaching staff VDTs users compared to 38 Arts teaching staff non- VDTs users.

Cross sectional study among VDTs users to determine the prevalence of symptoms.

The enrolled subjects exposed and controls were matching in age, gender, profession, environmental circumstances, but they differ as regard exposure to VDTs (EMFs) every day for at least 4 hours per day.

Both groups were subjected to an interview full detailed questionnaire for data collection, complete general clinical examination and Peak Expiratory Flow Rate. Appropriate statistics was done by SPSS.

Results: revealed that the exposure to VDT EMFs has significant health deviations such as headache, fatigue, dizziness, nausea, stress, clumsiness, dry eye, skin rashes.

Significant health deviations as regard rise of body temperature respiratory distress, heart rate fluctuation, palpitation and both systolic &diastolic blood pressures

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These results indicate relation between Video Operator Distress syndrome (VODs) and VDT EMFs exposure.
(VODs) is the term specific to computer users, this is due to physical effect of EMFs which disturb human biomagnetic and negative ions depletion in surrounding environment.
Conclusion: Many problems experienced by office workers using VDTs however; if a minimal risk exists, theoretically it could lead to thousands of workers are being adversely affected. Majority studies regard the EMR effects on workers health have been either negative or inconclusive. So it will be valuable for research to continue until it is possible to come to a still firmer conclusion. Then we may be able to really answer the question of whether or not ELF fields pose a health hazard.

SUMMARY

Video Display Terminals exposure has a considerable impact, related to the period of exposure in hours / day and cumulative exposure over years
The objective of this Study was to determine the adverse health effects due to video display terminal exposure in adult VDT users.
Subjects and Methods:
This study was carried out on two groups; both are working in Faculty of Computer Science and Faculty of Arts, Ain Shams University.
The control group is the teaching staff in the Faculty of Arts; the exposed group is the teaching staffing in the Faculty of Computer Science. Both are working in the same circumstances, as regard work time and the physical characters of the buildings, but the main difference was the exposure to VDT EMF. The number of enrolled subjects was 38 controls and 40 exposed to EMF every day for at least 4 hours / day, for at least one year.
Both groups were subjected to an interview, full detailed questionnaire for data collection, complete general clinical examination, and Expiratory Peak Flow Rate. Appropriate statistics was done by SPSS program.
The results of this study revealed that the exposed VDT users to EMF have significant health deviations; EMF can produce a variety of adverse health effects
The results of this study revealed that the exposure to EMF has significant health deviations. EMF can produce adverse health effects such as thermal injury, headache, fatigue, dizziness, nausea, stress, clumsiness, dry eye, skin rashes, respiratory distress and heart rate fluctuation. All these symptoms can be titled by Video Operator Distress syndrome (VODs). It is a term specific to computer users having such symptoms. This is due to physical effect of EMFs which disturb human biomagnetic field and negative ions depletion in surrounding environment.

This study showed that:

The awareness of adverse health effects among VDTs users was 17.5%.

The prevalence of symptoms of (VODs) is 100% since every one of participants was found to have one or more symptoms of VODs.

The prevalence of symptoms of (VODs) in different systems is as following:

CNS Symptoms:

Headache represents 77.5%, fatigue 40%, dizziness 67%, nausea 25%, stress 85% and memory changes37.5%, depression 40% in exposed.

Visual system:

Eye burning represents 35%, blurring35% and 50% decreased visual acuity in exposed.

Skin:

Skin rashes represent 12.5%, and burning 35% in exposed.

Respiratory system:

Nasal flu represents 22.5%, upper respiratory tract infection 30% in exposed.

Cardiac system:

Palpitation represents 40%, arrhythmia 12.5% in exposed.

In comparison between exposed and control group:

*Significant Thermal variation ($P<0.001$) in exposed.

*Insignificant tachypnoea, decreased PEFR in exposed.

*Insignificant elevation of both systolic and diastolic blood pressures in exposed.

In comparison among exposed after exposure as compared to their condition before exposure:

*Significant thermal variation ($P<0.001$).

*Significant tachypnoea and decreased PEFR ($P<0.05$).

*Significant elevation of systolic and diastolic blood pressures ($P<0.05$).

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LIST OF ABBREVIATIONS

AC	Alternating Current
PC	Personal Computer
AD	Alzheimer's Disease
EMF	Electromagnetic Fields
EMR	Electromagnetic Radiation
CRT	Cathode Ray Tube
LCD	Liquid Crystal Display
NIR	Non- Ionizing Radiation
ELF	Extremely Low Frequency
VLF	Very Low Frequency
LCD	Liquid Crystal display
VDT	Video Display Terminal
VDU	Video Display Unit
VODs	Video Operator Distress syndrome
PDC	Post translational-Detecting Cell
TLVs	Threshold Limit Value
WHO	World Health Organization
EPA	Environmental Protection Agency
UNEP	United Nation Environmental Program
IRPA	International Radiation Protection Association
NIEHS	National Institute of Environmental Health Science
NOISH	National Institute for Occupational Safety and Health
ACGIH	American Conference of Governmental Industrial Hygienists

LIST OF DEFINITIONS

EMF – Classically defined as an Electromagnetic Field, a volumetric property brought about by a combination of inseparable Magnetic and Electric fields. At lower frequencies the two fields need to be treated separately.

Electric Field – Volumetric property brought about by a difference of charged particle distribution.

Magnetic Field – Volumetric property brought about by a flow of charged particles (Electrons).

Gaussmeter – Generally an instrument used to detect Alternating Magnetism.

Hertz – Measure depicting Cycles/second.

Ion – Atom is electrically charged due to imbalance between its (Protons) and (Electron) charge distribution. The imbalance may occur as an unequal sharing between the atom and the molecule (or another atom) it is attached to. This generally leads to a Polarized Molecule as described below

RF–Radio Frequency: alternating Electromagnetic frequencies ranging from 30 MHz to 300GHz

SAR- Specific Absorption Rate.

Gauss – (English) measure of magnetic field density.
Tesla – (Metric) measure of magnetic field density

Measurements units for magnetic field: are microteslas (μT) and milligauss (mG).

LIST OF TABLES