شبكة المعلومات الجامعية

بسم الله الرحمن الرحيم

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات

يجب أن

تحفظ هذه الأقراص المدمجة بعيدا عن الغبار

شبكة المعلومات الجامعية

بعض الوثائق الأصلية تالفة

بالرسالة صفحات لم ترد بالأصل

B1V1CC

Growth Assessment Following Exposure To Electromagnetic Waves

A Thesis Submitted for Partial Fulfillment
Of a Master Degree
In Anatomy

By

Mona Hassan Mohamed Ali
M.B., B. Ch. (Suez Canal University)

Under Supervision of

Prof. Dr. Adel Nessim Abu Saif
Professor of Radiology
Faculty of Medicine
Suez Canal University

Dr. Raouf Abdel Rahman Fadel
Assistant Prof. of Anatomy
Faculty of Medicine
Suez Canal University

Dr. Abdel Halim Abdel Fattah Salem
Lecturer of Anatomy
Faculty of Medicine
Suez Canal University

Faculty of Medicine
Suez Canal University
2000

Acknowledgment

I wish to thank **Professor Dr. Mohamed Galal Yahia El-Badowi** Professor of Anatomy and chairman of Anatomy department, Faculty of Medicine, Suez Canal University for his suggestion of the idea of this work, for his guidance throughout the whole work, generous advice and constant help which made this work possible.

I would like to express my deep gratitude and sincere thanks to **Professor Dr. Adel Nessim Abu Saif** professor of Radiology, Faculty of Medicine, Suez Canal University for his valuable advises.

I feel very grateful to **Dr. Raouf Abdel Rahman Fadel** Assistant Professor of Anatomy, Faculty of Medicine, Suez Canal University for his guidance and support.

I wish to express my deep appreciation to **Dr. Abdel Halim Abdel Fattah Salem**, Lecturer of Anatomy, Faculty of Medicine, Suez Canal University, who introduced me to the field of physical anthropology, for his sincere assistance and generous help.

My warmest thanks to the people and children in El-Sheikh Zaied and Abu-Sultan who share in the study.

Finally my deep thanks to every person help me in finishing this thesis.

Contents

INTRODUCTION

Introduction

Growth is a continuous dynamic process occurring from conception to maturity and it refers to the progressive development of a living being or part of an organism from its earliest stage to maturity including the attendant increase in size. Also, development is defined as the series of changes by which the individual embryo becomes a mature organism *(Lowery, 1978).*

The study of growth patterns is of importance in the evaluation of individual differences regarding form and function. Also, it is important in elucidating the mechanisms of evaluation for evolution of the morphological characters necessarily comes about through alterations in the inherited pattern of growth and development *(Harrison et al., 1977).*

Many factors that affect the rate of development are known. The hereditary factors act by hastening or retarding physiological maturation from an early age while the environmental factors such as dietary restriction, season of the year, exposure to hazardous physical and chemical stresses simply affect the rate of growth. Others, such as socio-economic class, reflect a complicated mixture of hereditary and environmental influences *(Tanner, 1977).*

Several types of non-ionizing radiation as electro-magnetic waves, magnetic resonance waves and ultraviolet radiation have been the subject of considerable public attention and controversy in recent years *(Rom, 1994).*

Humans are constantly exposed to both natural and artificial sources of electromagnetic radiation ***(Brooks et al., 1996).***

Electromagnetic radiation consists of vibrating energy waves moving through space at the speed of light and accompanied by a vibrating magnetic field. Radio frequency is the portion of the electromagnetic spectrum ranging from about .03 Hz to 300 KHz (wavelength from 1 mm to 10 Km) ***(Brooks et al., 1996).***

The electromagnetic field from electric power and appliances oscillates at 60 Hz, and is this "flux" that is believed to induce biologic effects ***(Brooks et al., 1996).***

Prevention of exposures requires either source reduction, isolation by distance, or shielding. Electric fields are readily shielded, while magnetic fields penetrate through building materials and the human body ***(Wilkening, 1991).***

Electrification in developed countries has progressively increased the mean level of extremely low frequency electro-magnetic fields (ELF-EMFs) to which population are exposed. These human-made fields are substantially above the naturally occurring ambient electric and magnetic fields ***(Hulbert et al., 1998).***

The interest in possible biological effect of extremely low frequency magnetic fields (ELMF) (1-300 Hz) has increased in recent years due to the growing problems of technological awareness of the need to preserve our ecology ***(Grissett, 1980).***

Unsuspected prolonged exposure to abnormal environmental electro-magnetic fields (EMF), electric field (EF), or magnetic fields (MF) at 60 Hz in the bed room or work place may contribute to the development of various intractable medical problems ***(Omura et al., 1991).***

A report on EMF by the **US Office of Technology Assessment (OTA) (1989)** indicated that experiments in vitro suggest that EMF exposures have the potential to affect cell function by interaction with the cell response to different hormones and enzymes including those involved cell growth process.

Nordstrom & Co-workers (1983) found an apparent association between EMF exposure due to paternal work at an electrical substation and adverse pregnancy outcomes in addition to increased incidence of congenital malformation frequency in off spring.

AIM OF THE WORK

Aim of the work

The aim of the proposed study:-

Is to assess the effects of electro-magnetic waves, emerged from high voltage electrical power lines, on the growth pattern of an exposed group of children in Ismailia.

REVIEW OF LITERATURE