

Effect of Stress on the Testis and the Ovary in Albino Rats in Prenatal and Postnatal Periods (Histological and Histochemical Study)

Thesis

*Submitted for Partial Fulfillment of M.D Degree
in Anatomy and Embryology*

By

Nouran Khaled Ahmed Olama

*Assistant Lecturer of Anatomy and Embryology
Faculty of Medicine - Ain Shams University*

Under Supervision of

Prof. Dr. Salwa Saad Lasheen

*Professor of Anatomy and Embryology
Faculty of Medicine - Ain Shams University*

Prof. Dr. Seham Hassan Refaat

*Professor of Anatomy and Embryology
Faculty of Medicine - Ain Shams University*

Ass. Prof. Dr. Nagwa Ebrahim El-Nefiawy

*Assistant Professor of Anatomy and Embryology
Faculty of Medicine - Ain Shams University*

Dr. Rasha Mahmoud Abd-Elgawad

*Lecturer of Anatomy and Embryology
Faculty of Medicine - Ain Shams University*

Dr. Asmaa Ibrahim Othman

*Lecturer of Anatomy and Embryology
Faculty of Medicine - Ain Shams University*

Faculty of Medicine - Ain Shams University

2015

Acknowledgment

My profound thanks and deep appreciation to **Prof. Dr. Safwa Lasheen**, Professor of Anatomy, Faculty of Medicine, Ain Shams University for her generous help, valuable remarks and continuous guidance. It has been a great honor to work under her supervision.

I am deeply indebted to **Prof. Dr. Seham Hassan**, Professor of Anatomy, Faculty of Medicine, Ain Shams University for her continuous inexhaustible help and direction that extended throughout this work. She gave me the confidence and encouragement to complete this work.

I would like also to express my deep and special thanks to **Ass. Prof. Dr. Nagwa Ebrahim**, Assistant Professor of Anatomy, Faculty of Medicine, Ain Shams University for her generous guidance, advice and patience throughout all the stages of this work.

Many thanks to **Dr. Rasha Abd-Elgawad**, Lecturer of Anatomy, Faculty of Medicine, Ain Shams University for her caring and continuous support.

Many thanks to **Dr. Asmaa Ibrahim**, Lecturer of Anatomy, Faculty of Medicine, Ain Shams University for her help and support.

I am deeply grateful to **my mother and father** who directed, supported and encouraged me during the preparation of this work.

I am extremely sincere to **my sisters and brothers in law** who stood beside me throughout this work giving me their support.

Words fail to express my love, respect and appreciation to **my dear husband** for his unlimited help and support, his patience and total understanding. To you, I owe all the success I've reached.

Lastly, all the love to **my dear daughter Malak and son Eyad** for being patient, understanding and cheerful throughout this work.

Nouran Olama



Contents

Title	Page
• List of Abbreviations	
• Introduction	1
• Aim of Work	3
• Review of Literature	4
- Development of gonads	4
- Testis	5
- Ovary	19
- Noise	30
• Materials and Methods	46
• Results	53
• Discussion	212
• Summary.....	248
• Conclusion and Recommendations	256
• References	258
• Arabic Summary	--

List of Abbreviations

Abb.	Meaning
ABP	Androgen-Binding Protein
ACTH	Adrenocorticotrophic hormone
BPG	Brain-pituitary-gonad
COR	Cortisone
CRH	Corticotropine-releasing hormone
dB	Decibel
dpc	Days post coitum
FSH	Follicle-Stimulating Hormone
GCs	Glucocorticoids
GnRH	Gonadotropin-releasing hormone
HPA	Hypothalamic-pituitary-adrenal
HPG	Hypothalamic-pituitary-gonadal
HPO	Hypothalamic-pituitary-ovarian
Hx & E	Haematoxylin and eosin
LH	Lutenising hormone
PAS	Periodic Acid Schiff
PGCs	Primordial germ cells
Sry	Sex-determining region of chromosome Y
T	Testosterone
TUNEL	Terminal Deoxynucleotide Transferase dUTP Nick End Labeling



Introduction





Aim of Work





Review of Literature





Materials and Methods





Results





Discussion





Conclusion and Recommendations





Summary





References





Arabic Summary



Introduction

Stress is the sensation of strain or pressure. Small amounts of stress may be tolerable however excessive amounts of stress may lead to many problems. Stress was first defined as any disruption of the homeostasis (***Cannon, 1909***). It is an organic response of the hypothalamic-pituitary-adrenal axis to chemical, physical and emotional stimuli. Mental and physical stressors influence the body and the mind and lead to psychosomatic disease (***Rai et al., 2004***).

Stress was categorized into two types according to its duration. Acute stress is an abrupt, short-lasting (seconds to hours). Whereas chronic stress is recurring, persisting for several hours a day for weeks, months or longer (***Marković et al., 2011***). Stressors are numerous like water restriction, heat stress, immobilization stress, nutritional stress and noise stress (***Lue et al., 2000***).

Noise is the most prevalent insidious natural pollutant (***Swami et al., 2007***). Living organisms are exposed to potentially hazardous noise levels coming from the environment (***Uran et al., 2010***). Researchers suggested that noise stress could have negative impact on the reproductive organs. Stress seems to disturb natural fertility