Cairo University

Faculty of Veterinary Medicine

Department of Veterinary Hygiene
and Management

Mice as a Model of Human being In Studying Mood Disorders (Anxiety and Depression)

A thesis presented by

Heba Mohammed Ali Khalil

(BVSc. Cairo University, 2009; MVSc. Cairo University, 2014)

For the degree of

Ph.D. in Veterinary Medicine Science

(Animal Behaviour and Management)

Under supervision of

Prof. Dr. Essam Mostafa Abdel Gawad

Professor of Animal Behaviour and Management
& Head of Department of Veterinary Hygiene and Management
Faculty of Veterinary Medicine
Cairo University

Prof. Dr. Mohammed Yousef Saleh Matoock

Professor of Animal Behaviour and Management
Department of Veterinary Hygiene and Management
Faculty of Veterinary Medicine
Cairo University

(2018)

بسم الله الرحمن الرحيم

﴿وَما مِن دابَّةٍ فِي الأَرضِ وَلا طائِرٍ يَطيرُ بِجَناحَيهِ إِلّا أُمَمٌ أَمثالُكُم ما فَرَّطنا فِي الكِتابِ مِن شَيءٍ ثُمَّ إِلى رَبِّهِم يُحشَرونَ﴾

[الأنعام :38]

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Approval Sheet

The examination committee at 11/ 3/ 2018 approved the Ph.D. Thesis (**Mice as a Model of Human being in Studying Mood Disorders (Anxiety and Depression**) presented by Heba Mohammed Ali after the required correction have been done .

Examination Committee	**Signature**
Prof. Dr. U*sama* Abou-Ismail **professor of Animal and Poultry Behaviour & Management, Department of Husbandry &Development of Animal Wealth.** **Fac. Vet. Med., Mansoura University**	
Prof. Dr. Mervat M. Kamel **Professor of Animal Behaviour and Management** **Fac. Vet. Med., Cairo University**	
Prof. Dr. Essam M. Abdel-gawad **Professor of Animal Behaviour and Management** **Head of Animal hygiene and management** **Fac. Vet. Med., Cairo University**	
Prof. Dr. Mohamed Y. Matoock **Professor of Animal Behaviour and Management** **Fac. Vet. Med., Cairo University**	

Supervision Sheet

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Professor of Animal Behaviour and Management and
Head of Department of Veterinary Hygiene and Management
Faculty of Veterinary Medicine
Cairo University

Prof. Dr. Mohammed Yousef Saleh Matoock

Professor of Animal Behaviour and Management
Faculty of Veterinary Medicine
Cairo University

Cairo University
Faculty of Veterinary Medicine
Department of Veterinary Hygiene and Management

Name: Heba Mohammed Ali Khalil.
Nationality: Egyptian.
Date of Birth: 14/3/1987.
Place of Birth: Qatar.
Degree: Ph.D. degree of Veterinary Medicine Sciences (Animal Behaviour and Management).
Title: Mice as a Model of Human being in Studying Mood Disorders (Anxiety and Depression).
Under supervision of:

- Prof. Dr. Essam Mostafa Abdel Gawad (Professor of Animal Behaviour and Management and Head of Department of Veterinary Hygiene and Management, Faculty of Veterinary Medicine, Cairo University).
- Prof. Dr. Mohammed Yousef Saleh Matoock (Professor of Animal Behaviour and Management, Department of Veterinary Hygiene and Management, Faculty of Veterinary Medicine, Cairo University).

Abstract

Depression is one of the world's greatest public health problems. It has been demonstrated that stressful life events result in a failure in stress coping strategies in laboratory rodents including mice. Unpredictable chronic mild stress (UCMS) has been shown as an appropriate tool for modeling depression due to presence of important symptom (anhedonia) and the neurobiological changes that lead to depression. This dissertation was therefore carried out to design and verify the efficacy of unpredictable chronic mild stress as a model of depression and assess the efficacy of st. jhon`s wort (SJW) as antidepressant. 160 adult *swiss* albino mice of both sexes were housed in groups of five in either control group, control + saline, UCMS, UCMS+fluoxetine (FLX) and UCMS+ SJW. UCMS groups was exposed to different stressors in a chronic, mild and an unpredictable way for 8 consecutive weeks and injection regime was carried out in the 3rd week in control+vehicle,UCMS +FLX and UCMS+SJW until beginning of behavioural tests at the 6th week. Body weight and body coat were assessed. Elevated plus maze, open field test, sucrose consumption test, reward maze test, splash test and forced swim test were conducted. Plasma corticosterone and brain stem levels of dopamine and 5-OH were measured. Histopathological sections of hippocampus and cerebral cortex were taken. UCMS mice of both sexes displayed a reduction in body weight, a deterioration in body coat, and a decreased sucrose consumption, while an increase in the latency to pass 1st gate of the reward maze apparatus and in the latency to chew cookie. UCMS mice also showed a tendency of being in the closed arm of the elevated plus maze for longer duration compared to mice in the control group. UCMS mice showed a tendency of being immobile in forced swim test and exhibited also higher levels of plasma corticosterone and lower brain stem levels of both dopamine and 5-OHT compared to other groups. SJW showed a moderate antidepressant effect compared to FLX. It therefore appears that the presence of anhedonia, the hallmark of depression along with the significant neurobiological changes in the brain strongly support the efficacy of UCMS as a model of depression in human being.

Key words : Mice- Depression – Anhedonia –Antidepressant – Saint Jhon`s Wort - Fluoxetine- Serotonin – Forced swim test– Corticosterone-Unpredicatable chronic mild stress – Sucrose consumption test- Hippocampus.

Acknowledgment

*The Prayerful thanks to our Merciful **ALLAH** who gives us everything we have. I wish to express my deepest thanks and gratitude to **Prof. Dr. Essam Mostafa Abdel-Gawad**, professor of Animal Behaviour and Management, and Head of Department of Veterinary Hygiene and Management, Faculty of Veterinary Medicine, Cairo University for his supervision, kind encouragement, valuable guidance and continuous interest which are responsible for the completion of this work.*

*My sincere thanks to **Prof. Dr. Mohammed Yousef Saleh Matoock**, professor of Animal behaviour and Management, Department of Veterinary Hygiene and Management, Faculty of Veterinary Medicine, Cairo University for his supervision, indispensable support, sincere cooperation, worthful advices and generous help throughout the work.*

*Also, I want to acknowledge **Prof. Dr. Mervat M. Kamel** professor of Animal behaviour and Management, Department of Veterinary Hygiene and Management, Faculty of Veterinary Medicine, Cairo University. I greatly appreciate her scientific advice and support that was available for me all time. Her enthusiasm regarding the research of our field was really contagious and through her guidance I learned to work scientifically.*

*I also extend my thanks, appreciation and gratitude to **Dr. Marwa M. Abd-Rabo**, an assistant lecturer at National Organization for Drug Control And Research (NODCAR) , Giza, Egypt for her scientific advice and support that was available for me all time. Also for conducting the neurochemical analysis needed to complete this dissertation.*

*Grateful thanks are also due to **Prof. Dr. Usama Abou-Ismail**, a professor of Animal and Poultry Behaviour & Management, Behaviour and Welfare Group, Department of Husbandry & Development of Animal Wealth, Faculty of Veterinary Medicine, Mansoura University for his un conditional assistance and unhesitating willingness to read and evaluate my research paper.*

Further, I would like to thank all my colleagues in Animal Behaviour and Management, Department of Veterinary Hygiene and Management, Faculty of Veterinary Medicine, Cairo University, who accompanied me during this time.

Table of Contents