UNIVERSITI TEKNOLOGI MARA

ASSESSMENT OF ANTIOBESITY EFFECT OF FOLIC ACID ON INDUCED OBESE RATS

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Dissertation submitted in a partial fulfillment of the requirements for the degree of

Bachelor of Pharmacy (Hons.)

Faculty of Pharmacy

2014

ABSTRACT

Obesity is one of the major risk factor in the world that can cause many underlying diseases such as diabetes mellitus and cardiovascular diseases. Meanwhile, folic acid is predicted to have certain effects on lipid reducing activity and haematological analysis. The aim of this study was to examine the direct effects of folic acid in reducing the precursor factors of obesity by determining the anthropometrical parameters, biochemistry parameters and haematological parameters associated with obesity in experimental rats. There are five groups of obese female rats, each with different dose of treatment within 14 days. Group 1 until group 4 were treated with 2, 5, 10 and 20 mg/kg, respectively. The control group, group 5 was treated with normal saline. The biochemistry parameters including cholesterol, high density lipoprotein (HDL), low density lipoprotein (LDL) and triglycerides levels has been analysed using ILab Chemistry Analyzer 300 PLUS. The haematological analyses were done using Beckman Coulter International S.A COULTER® LH 500. To induce obesity, the female rats has been induce with ovariectomy surgical procedures. The results were analyzed by using One Way ANNOVA of SPSS 20th version in order to see the significance difference between the treated and the control group. In the anthropometrical studies, only the water intakes of the experimental rats had increased significantly in day 14, between the group 2 (5 mg/kg folate) and group 3 (10 mg/kg folate) and the control group. In biochemistry analysis, the cholesterol levels of group 1 (2 mg/kg folate) and group 2 (5 mg/kg folate) were significantly elevated as compared to the control group. As for the hematological analysis, only white blood cell counts (WBC) counts (group 1 and group 4), eosinophils, red blood cell (RBC) counts, hematocrytes, mean corpuscular volume (MCV), mean corpuscular haemoglobin (MCH), mean corpuscular haemoglobin concentration (MCHC) and mean platelet volume (MPV) has significance difference as compared to the control groups but with variance of increase and decrease. In summary, the folate treated rats has no significance difference from the control group, but these findings could be a reference in order to further investigating the effects of oral folate treatment in different period and condition.

ACKNOWLEDEGEMENTS

First and foremost, I would like to raise my gratitude to Allah. With his blessed and guidance, I finally came to the final submission of this thesis.

Secondly, I want to express a big appreciation and gratitude to my supervisor, Puan Maziana Binti Mahamood for her guidance, advices, suggestions and encouragement on behalf of my study. Not to be forgotten, a big thank you to Dr. Aida Azlina for the willingness to teach me for the surgical procedures.

Sincere thanks also to my colleagues, Ismah Syafiqah binti Ishak and others for their contributions, hardworking and meaningful moment throughout the years. My special appreciation also goes to Anwar for his big contributions in this project.

I also would like to thanks to all the faculty staffs of Pharmacy for their supportive cooperation.

Last but not least, I express my gratitude to my beloved parents, Encik Abd Kadir and for their continuous support and love, for teaching me to appreciate learning and education. Thank is also given to all individuals who had contributed directly or indirectly to the completion of my study.

CONTENTS

CHAPTER ONE

INTRODUCTION

1.1 Introduction/ Background study

1.1.1 Obesity

Obesity is one of the most common health problems in the world that can lead to many diseases such as type 2 diabetes mellitus (O Connor *et al.*, 2013). Almost all countries over the world have increase in prevalence of obesity. In Malaysia, the global findings recently have show that there is an increase of obesity especially in adults (Lin Khor, 2012). This situation may cause loads in term of living cost and eventually reduce the quality of human life (Wan Nazaimoon *et al.*, 2011).

1.1.2 Folic Acid Supplementation

Folic acid is also known as vitamin B9 or folate. The word folate came from the Latin word *'folium'* which means leaf, as it is extracted from spinach (Mitchell *et al.*, 1988). It serve as a supplement and helps in preventing many chronic diseases. It is suggested as a supplementation in pregnancy woman in order to decrease the tendency of the offspring to experience neural tube defect (Cho *et al.*, 2013). The overall metabolic process of folic acid serve as an important factor that affect the body function such as nervous system and cardiovascular system