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NEUROPROTECTIVE EFFECT OF α-MANGOSTIN IN MPTP-INDUCED PARKINSON'S DISEASE IN MICE : BEHAVIOURAL ASSESSMENT

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TABLE OF CONTENT

ABSTRACT

Parkinson's disease (PD) is the second most common neurologic disorders after Alzheimer's disease (AD). It has no cure yet, but many symptoms can be relieved by medication, unfortunately, with side effects. Hence many researches have been carried out to design and develop new drugs for the management of PD with less side effects. The purpose of this study was to study the effect of α-mangostin on behavioural of mice with MPTP-induced PD. The study was conducted on 42 healthy male mice divided into 6 groups (n=7). All of these groups except one group of mice were induced with MPTP (10 mg/kg, i.p.) on day 1, day 3, day 5 and day 7. After induction with MPTP, alpha mangostin (3 and 6 mg/kg, p.o.), standard drug (Sinemet, p.o.) and L-NAME (5 mg/kg, i.p.) with combination of 3 mg/kg (p.o.) were given for 8 days. During 15 days of treatment, body weight was recorded. Rotarod activity and grip strength before and after administration of MPTP as well as during and after treatment of α-mangostin was measured. Results showed that administration of MPTP significantly decreased body weight, rotarod activity and grip strength as compared to control group ($p < 0.01$). Furthermore, post treatment with alpha mangostin (3 and 6 mg/kg, p.o.), significantly and dose dependently improved the body weight, rotarod activity and grip strength in MPTP-treated mice ($p < 0.05$). Interestingly, combination of L-NAME (5 mg/kg, i.p.) with the lower dose of alpha mangostin (3 mg/kg, p.o.) did not alter body weight, fall of time and grip strength significantly in comparison to both alpha mangostin groups in MPTP-induced mice. Therefore, neuroprotective effect of α-mangostin was exhibited against MPTP-induced mice and the behaviour was improved in PD animal model.

CHAPTER 1

INTRODUCTION

1.1 Introduction

Neurodegenerative diseases are consisting of neurologic disorders that can give impact to neurons and lead to death of neurons. Both necrosis and apoptosis are major processes that involve in initiating cell death. Parkinson disease (PD) is a neurodegenerative disorder which is characterized by the death of dopamine neurons in the substantia nigra pars compacta. Thus, dopamine level in the caudate nucleus and putamen will be decreased (Eric, 2001). PD is the second most common neurodegenerative diseases after Alzheimer's disease (AD) (Tanner and Goldman, 1996; Siderowf and Stern, 2003). Generally, men have a higher risk factor in getting PD than women and ageing also contributes to the development of PD. Bradykinesia, tremor at rest, cogwheel rigidity, changes in autonomic functions, bad handwriting and weight reduction are the symptoms which seen in PD patients. PD can be identified by the presence of *Lewy bodies* containing ubiquitin and a-synuclein in dopamine neurons and impaired and depigmentation of neuron in the substantia nigra (Hornykiewicz, 2010). Healthy individuals have a reserve of nigrostriatal dopaminergic neurons; PD patients will show parkinsonian symptoms if approximately 80% of these neurons are lost. The causes of PD are unknown until today. However, there are many possibilities, including genetic factors and