UNIVERSITI TEKNOLOGI MARA

THE EXPRESSION OF GAPDH GENE IN HUMAN BLOOD AS EARLY DETECTION OF ALZHEIMER'S DISEASE

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CHAPTER 1

INTRODUCTION

1.1 Background of Study.

Alzheimer's disease (AD) is the most common form of dementia, which is highly heritable and has a complex pattern of etiology (Momeni & Ferrari, 2010). Globally, the prevalence of dementia is estimated to be as high as 24 million. This number is suspected to increase two fold in every 20 years until year 2040 (Mayeux & Stern, 2012). The disease, which has been studied after almost 100 years was named after the investigator's name, Alois Alzheimer in 1906 (Raja, 2010).

AD is a neurodegenerative disease that can be identified by progressive cognitive decline, loss of memory and changes in behavioural, psychological and personality (Paula & Guimarães, 2009). It is associated with accumulation of extracellular deposits amyloid plaques and intracellular protein aggregates (Filippov & Dityatev, 2012).

According to Natural Academy on an Aging Society, there are 4 million of American peoples having Alzheimer's disease and 90 per cent of them are age 65 years old and older (Wright & Lund, 2000). The number of patients with AD in United States is estimated to reach 16 million peoples by the year of 2050 (Tarawneh & Holtzman, 2012). AD can be divided into two types according to their onset which are early onset Alzheimer's disease (EOAD) and late onset Alzheimer's disease (LOAD)

(Anand, Kaushal, Wani, & Gill, 2012). The most common risk factor for AD is age and genetic of a patient (Nowotny & Louis, 2001). Specifically, there are no treatments that can be used to stop or reverse the process of neurodegenerative of the brain (Mattson, 2011). Drug such Donepezil can slightly improve the cognitive function of AD patient (Winslow et al., 2011). However, more study need to be done in order to provide the best treatment management to the patients.

1.2 Problem Statement.

There are many ways and approaches to diagnose AD, however, to make an accurate diagnosis of AD in the early stage of the disease is very difficult. According to Gauthier (2006), there are absence of biological biomarkers for preclinical detection of AD.

In a patient with AD, the alteration of molecules that lead to this neuropathology pathway may already take place 20 years before the clinical appearance of the present AD (Lista, Faltraco, Prvulovic, & Hampel, 2013). With the current evaluation of neurophysiology, it can be used to identify the patient that already in advanced stage of AD and define it by signs and symptoms (Rodríguez & Verkhratsky, 2011)

Current AD diagnosis tool available is by using Positron Emission Tomography (PET) scanning. During this procedure, a radiolabelled substance is injected into the brain. This substance will visualize the brain in order to collect the information about