

P9 ALTERED mRNA EXPRESSION IN ISCHEMIC RAT BRAIN

Suwanakitch P¹, Jeenapongsa R¹, Saelim N¹, Tohda M², Watanabe H²

¹*Department of Pharmacy practice, Faculty of Pharmaceutical Sciences, Naresuan University, Muang, Phitsanulok 65000, THAILAND*

²*Division of Pharmacology, Institute of Natural Medicine, Toyama Medical and Pharmaceutical University, Toyama, JAPAN*

Introduction: Permanent occlusion of bilateral common carotid arteries in rats (2VO) is a useful model for studying of ischemic-induced dementia. Alzheimer's disease (AD) is one of the most common types of dementia. AD and demented patients exhibit common pathophysiology and symptoms. Since a number of proteins have been found to be involved in the AD therefore similar alteration may be observed in ischemic-induced dementia.

Objective: This study aimed to investigate the expression of AD-related mRNAs in ischemic rat. The mRNAs studied were acetylcholinesterase (AChE), beta-amyloid precursor protein (APP), cyclooxygenase-2 (COX-2), alpha7 nicotinic acetylcholine receptor (alpha7 nAChR) and gamma-secretase mRNAs.

Methods: Common carotid arteries of male Wistar rats (14 wk) were occluded under pentobarbital anesthesia (2VO rats). The animals were sacrificed at the day 2, 4, 7, 14, 35 and 112. Whole brain was removed and used for RNA isolation. Reverse transcription – Polymerase chain reaction (RT-PCR) was employed to synthesize cDNA. Several primers had been designed to specifically detect AChE, APP, COX-2, alpha7 nAChR and gamma-secretase mRNA expressions. The PCR products were resolved by polyacrylamide gel electrophoresis and stained with ethidium bromide.

Result and discussion: At day 2 after the operation, the 2VO and SHAM rats similarly expressed AChE, APP, COX-2, alpha7 nAChR and gamma-secretase mRNAs. 2VO rats, at day 4, significantly expressed greater amount of APP, alpha7 nAChR and secretase mRNAs than the sham ($P < 0.05$). The AChE mRNA level tended to be decreased after 35 days and lasted until 112 days in 2VO rats. However, the expression of COX-2 mRNA was not altered at all periods. This indicates that the expression of AD-related genes can be detected in ischemic-induced dementia rats. It also suggests that the 2VO model may be partly used as a model to screen for new compounds that have potentials in the treatment of AD.