



# Exploring the efficacy of cholecalciferol on the dysfunction of insulin signaling pathway associate with $\alpha\beta 40/42$ and tau hyperphosphorylation in scopolamine-induced ad rat model

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## Abstract

**Introduction:** Alzheimer's disease (AD) is a neurodegenerative disorder is characterized by memory impairment, presence of oligomers  $A\beta$ , loss of neurons and synapses and, insulin resistance. Recent preclinical and human studies proposed that impairment in insulin signalling leading to prevailing insulin resistance may contribute to pathogenesis of AD through mediating insulin signalling-associated proteins. The precise biological changes in AD, the different rates of progression in affected individuals and how AD can be slowed or prevented are still largely unknown. There are no permanent therapeutic or protective treatments available for AD as of yet. An alternative approach for a more effective and cost-saving treatment is essential to delay/treat the advancement of AD. Vitamin D deficit can cause cognitive impairment for example impaired memory and learning. However, the underlying molecular defects remained unresolved. Hence this study was explored the effects cholecalciferol on insulin signalling pathway of AD animal model.

**Objective:** The objective is to investigate the effects of cholecalciferol on  $A\beta 40/42$  and tau hyperphosphorylation associate with the dysfunction of insulin signaling pathway in scopolamine- induced AD rat model.

**Method:** 40 male Sprague Dawley rats aged four months old and weighed  $350 \pm 50$  g, were randomly divided into five groups ( $n=8$ ) as Table 1. The experiments was performed according to the Animal Ethic Protection Committee of PAPRSB Institute of Health Sciences, Universiti Brunei Darussalam, Brunei. Control group was administered with 0.9% saline (w/v) for 28 consecutive days. Scopolamine (2.5 mg/kg), as a disease inducer, was administered to all the groups through i.p route. The treatment groups were given Donepezil (5 mg/kg) and cholecalciferol (71.42 IU/kg,) by oral gavage for 28 consecutive days (Table 1). Scopolamine was dissolved in 0.9% saline solution while cholecalciferol was dissolved in sunflower oil. Sunflower oil was administered orally via oral gavage in Vehicle control group (same volume as scopolamine-cholecalciferol treated group).

## Biography

Tushar Kanti Das has completed his PhD in Institute of Reproductive Medicine, Salt Lake, Kolkata, India. He currently works Institute of Reproductive Medicine, Salt Lake, Kolkata, India, Universiti Brunei Darussalam, PAPRSB Institute of Health Sciences, Jalan Tungku Link, Gadong, Brunei Darussalam, Brunei.



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