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# Brain insulin resistance in alzheimer's disease: targeting phosphoinositide 3-kinase (pi3k)/akt/gsk-3β pathway

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## Abstract

ICV-STZ was used for the model of sporadic Alzheimer's disease being established. Adult male Wistar rats (64) weighing 200-300 g bred in Central Animal House facility of Panjab University were used. Animals were randomly divided into 8 groups comprising 8 animals in each group as follows:

Protocol lasted for 21 days, sacrificing animals on 22nd day followed by isolation of serum and dissection of cortex and hippocampus, preserving the same for further analysis.

Behavioral studies like Morris water maze was done for assessing spatial memory, novel object recognition for associative memory and actophotometer was performed for locomotor activity.

Biochemical estimations for antioxidant activity or oxidative stress such as reduced glutathione estimation, superoxide dismutase assay, catalase assay, glutathione peroxidase assay, myeloperoxidase assay, glutathione S-transferase assay, lipid peroxidation assay, and protein carbonylation assay were performed in the homogenates of cortex and hippocampus of the brain which are the specific regions for memory, learning and cognition. For nitrosative stress, nitrite estimation was done. Protein concentrations were determined by the biuret method. Cholinergic activity was evaluated by acetylcholinesterase assay to assess the cholinergic dysfunction which is one of the core pathologies of dementia and AD.

Inflammatory cytokines like TNF-α, IL-6 was determined by ELISA method to evaluate the neuroinflammation which is aggravated by insulin resistance. C-reactive protein, a marker of neuroinflammation and neurodegeneration was also determined by ELISA.

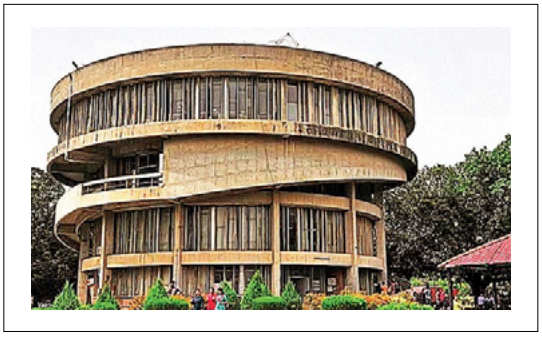
Mitochondrial dysfunction was evaluated estimating mitochondrial enzyme complex-I, II, III, IV depicting picture of viable and non-viable neuronal cells.

Histopathology was done by H&E staining to find out apoptotic cells, neuroinflammation, and neurodegeneration.

Molecular technique like RT-PCR for IRS-1, PI3-K, AKT, GSK 3-β and BDNF was performed for gene expression analysis.

## Biography

Ansab Akhtar has received his BPharma from Jamia Hamdard University and MS degree from NIPER, Hyderabad. Currently he is pursuing his PhD in Pharmacology from University Institute of Pharmaceutical Sciences Panjab University, Chandigarh, India.



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