

Short-term High-fat Diet and Streptozotocin Administration Induces Altered Hippocampal Memory, Neuronal, and Biochemical Functions.

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London, United Kingdom and online, July 12 - 15, 2026

Afe BABALOLA UNIVERSITY

ALZHEIMER'S ASSOCIATION

P-0295

Abstract#464

Short-term High-fat Diet and Streptozotocin Administration: A Valuable Model that Induces and Provides Insight on the Pathological Mechanisms Underlying Memory Decline in T2DM.....

Introduction

- Problem**
- Diabetic conditions are associated with altered brain functions, such as memory deficits, through undetermined processes like synaptic dysfunction, neurodegeneration and biochemical imbalance (Pugazhenthil et al., 2017).
 - In order to further understand the disease pathology, diabetic models that will throw more insight into the disease pathology are elucidated.
- Diabetic Model**
- High-fat-diet (HFD) and streptozotocin (STZ) model:** Is a model that mimics the human condition of type 2 diabetic in experimental animals.
 - In this model, the experimental animals are exposed to a high-fat diet to produce insulin resistance, followed by administering a low dose of STZ to destroy the pancreatic islet β-cell and cause insulin deficiency (Liu et al., 2013).
- Aim**
- Investigate the effect of short-term administration of high-fat diet and streptozotocin induction on synaptic function, neurodegeneration and biochemical processes in the hippocampus of mice brains.

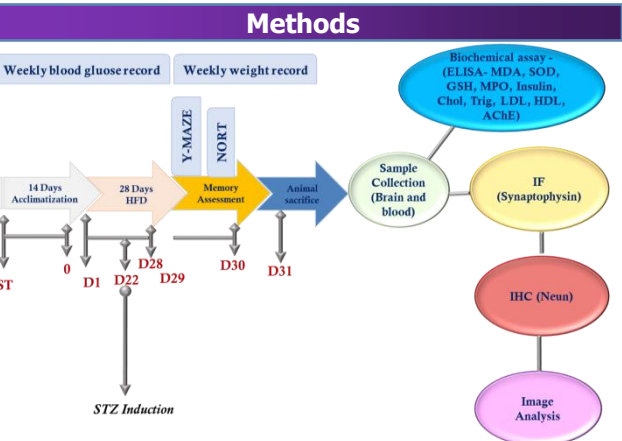
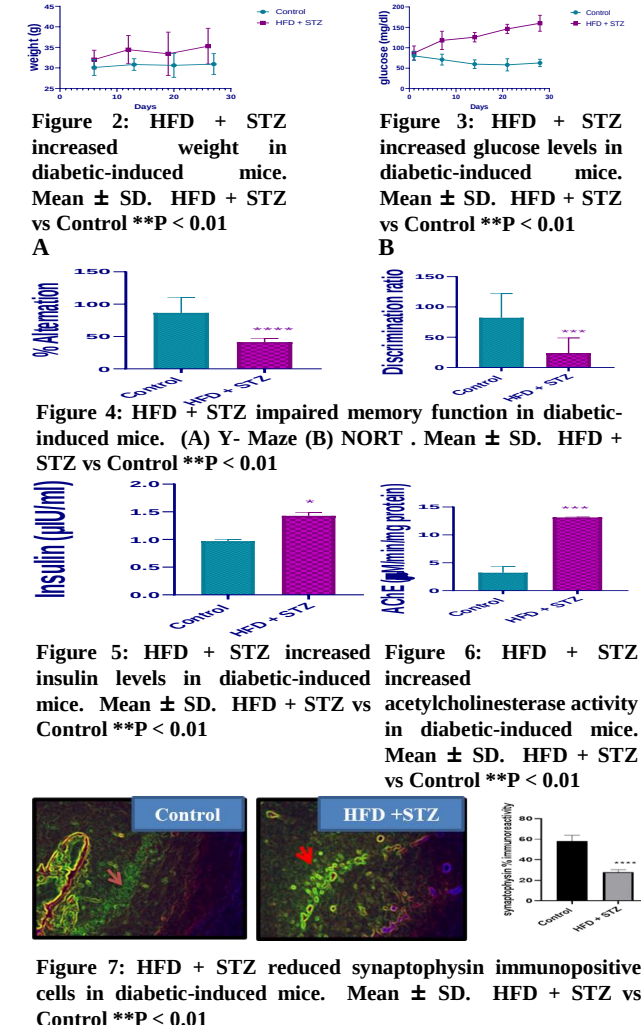


Figure 1: Experimental flow chart

Results



Results

Table 1: Effect of HFD + STZ on oxidative stress markers and lipids on mice brains

BIOCHEMICAL PARAMETERS	CONTROL GROUP	HFD + STZ GROUP
Oxidative stress markers		
MDA	16.58 ± 1.74	25.22 ± 1.01*
MPO	0.15 ± 0.04	0.59 ± 0.11*
SOD	0.73 ± 0.19	0.25 ± 0.09*
GSH	16.62 ± 5.09	3.38 ± 1.19*
Lipid function test		
HDL	1.28 ± 0.11	0.81 ± 0.01*
LDL	0.36 ± 0.19	5.83 ± 1.29*
CHOL	2.69 ± 0.38	11.33 ± 1.88*
TRIG	0.08 ± 0.01	0.18 ± 0.01*

Figure 8: HFD + STZ reduced neuron immunopositive cells in diabetic-induced mice. Mean ± SD. HFD + STZ vs Control **P < 0.01

Group	Neuron % Immunoreactivity
Control	~80
HFD + STZ	~30

Conclusion

- Short-term administration of HFD + STZ impaired hippocampal memory functions by altering neuronal activities and biochemical processes in the mice brains.

Acknowledgement

- I acknowledge the Alzheimer's Association for awarding me the Travel Fellowship to participate in this conference.

References

- Pugazhenthil S, Qin L, Reddy PH. Common neurodegenerative pathways in obesity, diabetes, and Alzheimer's disease. Biochimica et biophysica acta (BBA)-molecular basis of disease. 2017 May 1;1863(5):1037-45.
- Z. Liu, W. Li, X. Li et al., "Antidiabetic effects of malonyl ginsenosides from Panax ginseng on type 2 diabetic rats induced by high-fat diet and streptozotocin," Journal of Ethnopharmacology, vol. 145, no. 1, pp. 233–240, 2013.

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