



Brain Stimulation Therapies in Neuropsychiatric and Neurodegenerative Diseases

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Citation: Martins IJ (2018) S Brain Stimulation Therapies in Neuropsychiatric and Neurodegenerative Diseases. Int J Genom Data Min 02: 127. DOI: 10.29011/2577-0616.000127

Received Date: 04 July, 2018; Accepted Date: 06 July, 2018; Published Date: 12 July, 2018

Letter to the Editor

Brain stimulation therapies for the treatment of neuropsychiatric and neurodegenerative diseases [1] have become of major interest to various global communities. Neuropsychiatric and neurodegenerative diseases associated with insulin resistance are expected to affect millions of people by the year 2050 [2,3]. The treatment by brain stimulation therapies in the early stages of neuropsychiatric conditions may allow stabilization or reversal of various conditions such as depression, schizophrenia, bipolar disorders, behavioural, cognition and memory disorders. Brain stimulation therapies include Electroconvulsive Therapy (ECT), Vagus Nerve Stimulation (VNS), Deep Brain Stimulation (DBS), Transcranial Direct Current Stimulation (tDCS) and repetitive transcranial magnetic stimulation. Brain stimulation therapies such as ECT should be reassessed with relevance to dose and frequency for the treatment of psychiatric and behavioral disorders. The major concern with ECT is associated with excessive heat generation and inactivation of genes required for neuron survival [4]. In diabetes and neurodegenerative diseases drug therapy may not be effective for depression and schizophrenia with unsuccessful anti-depressant or anti-psychotic drug treatment. Brain stimulation therapies such as ECT, VNS, DBS, tDCS and rTMS that use direct electrical currents to stimulate specific parts of the brain may be therapeutic when drug treatment is ineffective. However, brain treatment by these different stimulation therapies need to be compared with relevance to excessive heat generation with compete heat shock gene inactivation that leads to accelerated neuron death [5]. In man the heat shock gene Sirtuin 1 is essential to maintain mitochondrial function and its inactivation is associated with neuron mitophagy [4,5].

Diabetes and neurodegenerative disease patients require nutritional interventions that activate Sirt 1 and assist with the brain

stimulation therapies. Diets that contain xenobiotics and toxins inactivate neuron Sirt 1 with extended brain stimulation therapy associated with accelerated neuron mitophagy. Sirt 1 is essential to maintain synaptic plasticity with various food components essential for its maintenance [6]. Brain stimulation therapies need to be carefully reassessed to determine the dose and time interval for treatment of various neuropsychiatric disorders with appropriate dietary interventions to prevent neuron apoptosis and synaptic plasticity defects with relevance to accelerated neurodegeneration.

Acknowledgements

This work was supported by grants from Edith Cowan University, the McCusker Alzheimer's Research Foundation and the National Health and Medical Research Council.

References

- Holtzheimer PE, Kosel M, Schlaepfer T (2012) Brain stimulation therapies for neuropsychiatric disease. *Handb Clin Neurol* 106: 681-695.
- Tabrizi S (2006) Neurodegenerative diseases neurobiology pathogenesis and therapeutics. *J Neurol Neurosurg Psychiatry* 77: 284.
- Egede LE, Ellis C (2010) Diabetes and depression: global perspectives. *Diabetes Res Clin Pract* 87: 302-312.
- Martins IJ (2018) Electroconvulsive Therapy and Heat Shock Gene Inactivation in Neurodegenerative Diseases. *Ann Neurodegener Dis* 3: 1028.
- Martins IJ (2018) Heat Shock Gene Inactivation and Protein Aggregation with Links to Chronic Diseases. *Diseases* 39: 1-5.
- Martins IJ (2017) Dietary Interventions Reverse Insulin and Synaptic Plasticity Defects Linking to Diabetes and Neurodegenerative Diseases. *SL Nutrition and Metabolism* 111: 1-5.