Jun Tan, J Neurol Disord 2018, Volume 6
DOI: 10.4172/2329-6895-C6-041

14th World Summit on
Alzheimer's Disease, Dementia Care Research and Awareness
&
6th World Summit on Heart, Stroke and Neurological Disorders
August 31- September 01, 2018 | Boston, USA

LISPRO mitigates β-amyloid and associated pathologies in Alzheimer's mice

Jun Tan
University of South Florida, USA

Lithium has been marketed in the United States of America since the 1970s as a treatment for bipolar disorder. More recently, studies have shown that lithium can improve the cognitive decline associated with Alzheimer's disease (AD). However, current the United States Food and Drug Administration-approved lithium pharmaceutics (carbonate and citrate chemical forms) have a narrow therapeutic window and unstable pharmacokinetics that, without careful monitoring, can cause serious adverse effects. Here, we investigated the safety profile, pharmacokinetics and therapeutic efficacy of LISPRO (ionic co-crystal of lithium salicylate and l-proline), lithium salicylate and lithium carbonate (Li_2CO_3). We found that LISPRO (8-week oral treatment) reduces β-amyloid plaques and phosphorylation of tau by reducing neuroinflammation and inactivating glycogen synthase kinase 3β in transgenic Tg2576 mice. Specifically, cytokine profiles from the brain, plasma and splenocytes suggested that 8-week oral treatment with LISPRO down-regulates pro-inflammatory cytokines up-regulates anti-inflammatory cytokines and suppresses renal cyclooxygenase 2 expression in transgenic Tg2576 mice. Pharmacokinetic studies indicated that LISPRO provides significantly higher brain lithium levels and more steady plasma lithium levels in both B6129F2/J (2-week oral treatment) and transgenic Tg2576 (8-week oral treatment) mice compared to Li2CO3. Oral administration of LISPRO for 28 weeks significantly reduced β-amyloid plaques and tau-phosphorylation. In addition, LISPRO significantly elevated pre-synaptic (synaptophysin) and post-synaptic protein (postsynaptic density protein 95) expression in brains from transgenic 3XTg-AD mice. Taken together, our data suggest that LISPRO may be a superior form of lithium with improved safety and efficacy as a potential new disease-modifying drug for an AD.

Biography

Jun Tan received his Bachelors of Medicine in China in 1983. He earned his Masters of Science in human genetics at Fudan University in 1989. He completed his Doctoral degree in biological medicine in China and postdoctoral studies in 1996 at the University of Michigan, Ann Arbor. In 1998 he became Assistant Professor of Psychiatry & Behavioural Medicine at USF and was promoted to Associate Professor in 2004 and Professor in 2007. Over the past 20 years, Dr. Tan has authored more than 150 original scientific papers in prestigious international journals such as Science, Nature Neuroscience and Nature Commutations. Dr. Tan's philosophy is that everyone on his team has a strength and that the best way to lead is to find a way to utilize those strengths together in building a concerted effort toward success. "You can achieve great things in the USF Silver Child Development Center if you believe".

jtan@health.usf.edu

Notes: