

Aerobic Glycolysis Couples Metabolic Syndrome to Dementia Disease

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Abstract

Dementia Disease (DD) is a global epidemic; every 3 seconds someone in the world develops dementia. An estimated 50 million people are living with a disease that cannot be prevented, treated or cured. Without novel breakthroughs, AD is predicted to exceed 130 million by 2050. Pharmaceuticals offer minimal relief with dismal evidence of reversing neurodegeneration. Research focuses on β -amyloid plaques and tau tangles; but, in a clinical trial, medications designed to sop-up toxic proteins in the brain fail to impede neural decline. Instead, plaques and tangles appear to be late-arrivers in the insidious progression of dementia. The recent explosion of comorbid metabolic pathologies (global prevalence of T2DM estimated @ 463 million) invites researchers into a deeper discussion of bioenergetics regulating cognitive impairment and metabolic dysregulation. Age-related energy deficits, driven by peripheral insulin resistance, exacerbate A β /tau accumulation, increase oxidative stress and impede mitochondrial function; work by Sergi et al. and Mastroeni et al. suggest that mitochondrial dysfunction with epigenetic impairment in oxidative respiration appear to be the earliest offenders in the progression of T2DM and AD [1,2]. This case report highlights a novel, integrated intervention with a 69-year-old male dually diagnosed with T2DM and Mild Cognitive Impairment (MCI). Physiological biomarkers were measured pre/mid/post-intervention; the MoCA (Montreal Cognitive Assessment) measured cognitive function, pre/post. Statistically significant results were observed in the metabolic risk biomarkers, memory was restored to normal ranges, and the HbA1c normalized out of the diabetic range Furthermore, the metabolic and cognitive improvements were

sustained @ 3 months postintervention. These promising results suggest that dietary ketogenesis restores peripheral insulin sensitivity, mitigates T2DM and improves cognition by circumventing neural starvation via the restoration of metabolic flexibility

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