



ApoE4, the door to insulin resistant dyslipidemia and brain fog? A Case Study

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INTRODUCTION

Mild Alzheimer's Disease initiated by:

- Cerebral Hypometabolism; HOMA-IR inversely related to cerebral glucose metabolism
- ApoE4 gene variant
- AMPK/mTOR signaling irregularities

MCI attenuated and/or reversed via nutritional ketosis evidenced by normalization of HgA1c, fasting insulin, HOMA-IR, TRI/HDL Ratio & MoCA

METHODS

Adult male (age 68), heterozygous ApoE4 carrier, previously diagnosed with comorbidity of T2DM & MCI

Cognitive Assessment:

- MoCA (Montreal Cognitive Assessment)

Blood biomarkers:

- HgA1c
- Fasting insulin
- Blood Lipids
- Fasting glucose
- Blood Ketones (.5 – 2.0)

Dietary intervention:

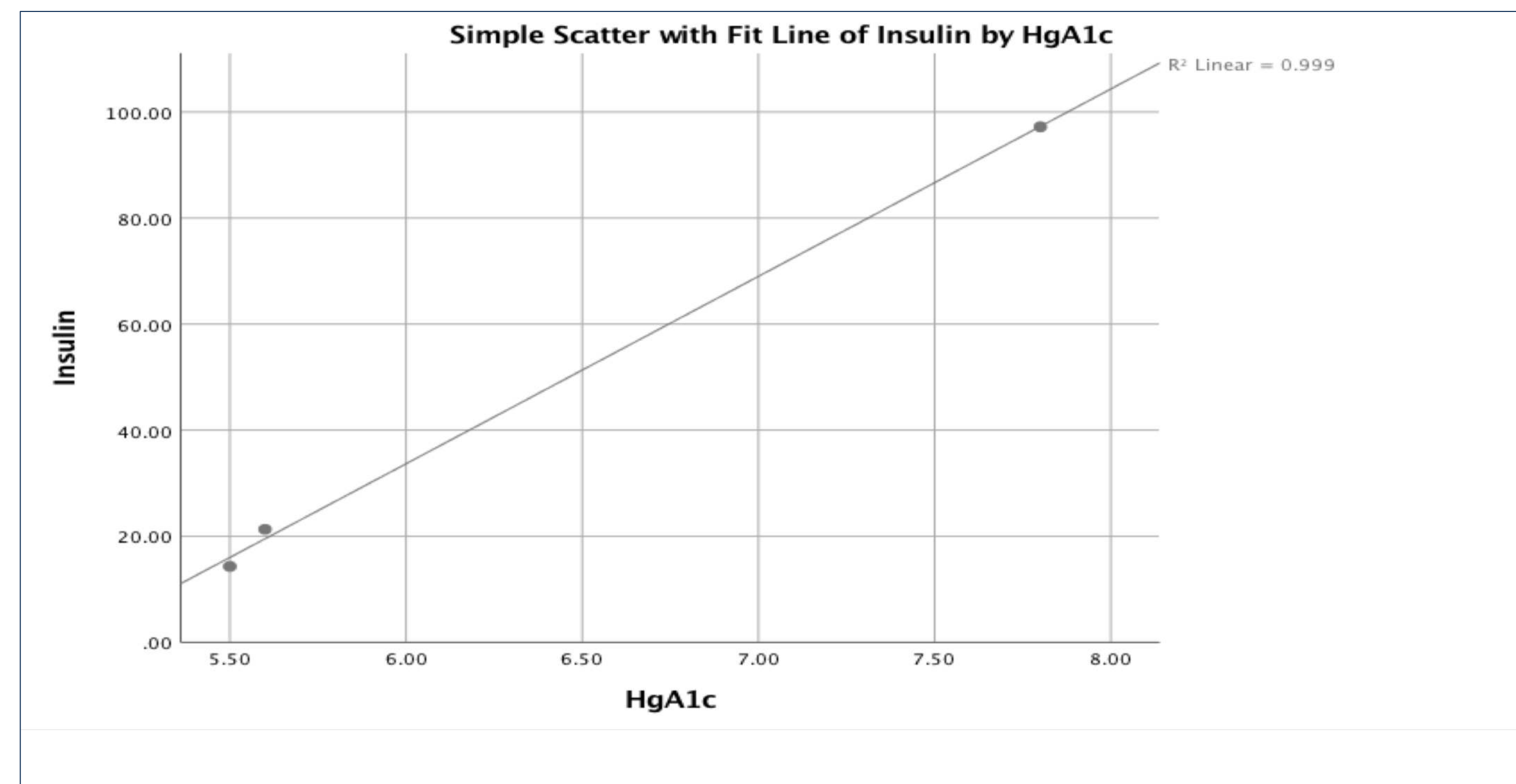
- Dietary ketosis

Behavioral Intervention:

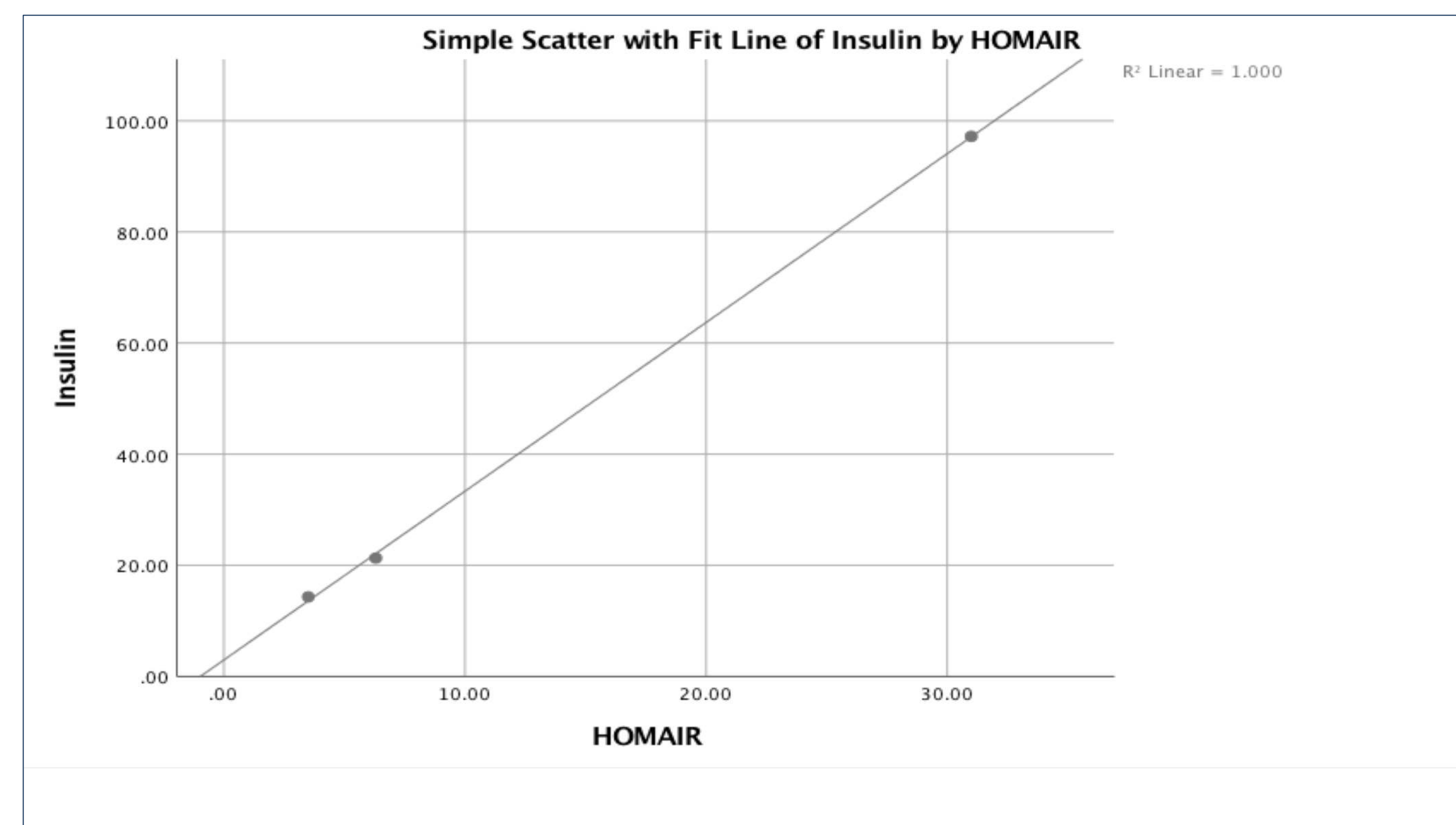
- PEAK brain training games

RESULTS After 10-Week Nutritional/Behavioral Intervention

	Pre- Intervention	Post Intervention	Percent Change
HgA1c	7.8%	5.5%	-29.5%
Fasting Insulin	97.2 mU/L	14.3 mU/L	-85.3%
HOMA-IR	31.0	3.5	-88.8%
Tri/HDL ratio	4.9	2.2	-55.5%
MoCA	23/30	29/30	+26.1%



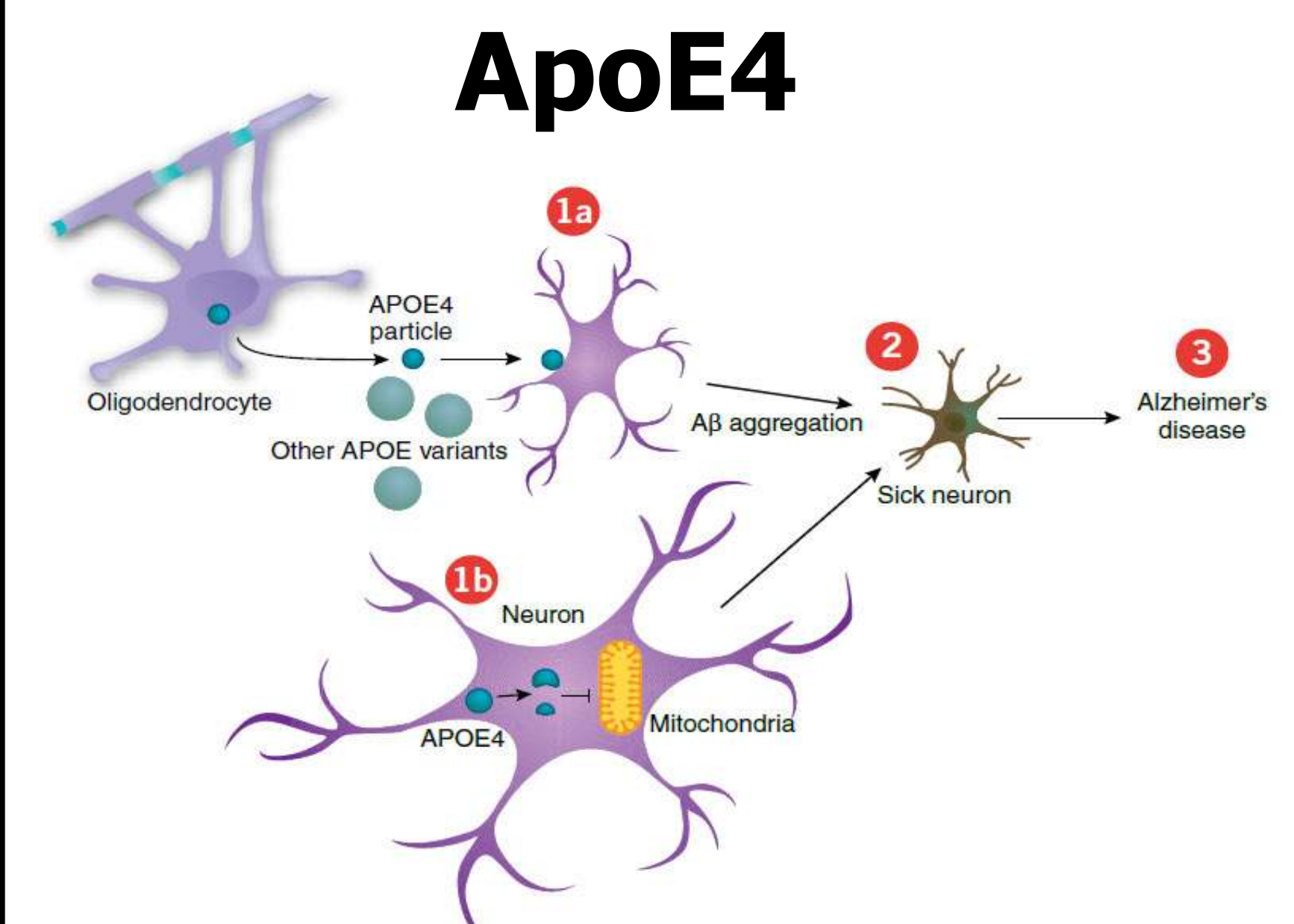
The patient's HgA1c was positively correlated with reduced fasting insulin levels and reflects statistical significance, adjusted $R^2 = 0.997$, $p = 0.024$



The patient's HOMA-IR was positively correlated with reduced fasting insulin levels and reflects statistical significance, adjusted $R^2 = 0.999$, $p = 0.010$

CONCLUSION

Ketogenic protocols seem to exert powerful modulatory effects on the most treatment resistant conditions including obese carriers of the ApoE4 variant who suffer from comorbid MCI and T2DM. Previous clinical trials have demonstrated the neurological efficacy of the KD (ketogenic diet). The significant improvements in memory, executive function, MetS pathologies and cerebral metabolic rate (CMR) demonstrated in this case study are reproducible and could be easily translated to a general population of MetS patients with self-reported impairments in cognition. The novel approach of nutritional modulation to halt brain atrophy and restore cognitive functionality warrants further investigation.



Stoykovich S, Gibas K. APOE ε4, the door to insulin-resistant dyslipidemia and brain fog? A case study. *Alzheimers & Dementia: Diagnosis, Assessment & Disease Monitoring*. 2019;11:264-269. doi:10.1016/j.dadm.2019.01.009.