Neuropsychological Findings in Idiopathic Adult-Onset Epilepsy Case Study: Noorda COM Student Investigation

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Background

Epilepsy: Repetitive, uncontrolled seizures, abnormal electrical activity within the brain. There are many pathologies responsible for seizures as inception and presentation can vary significantly.

We report the case of a 25-year-old male patient with idiopathic adult-onset epilepsy. The patient presented with recurrent seizures with no identifiable cause. These seizures are characterized by:

- A lack of extremity control
- Muscle spasms
- Loss of cognitive function
- Duration between 0-60 minutes

The patient's condition began five years ago while living abroad. The seizures have not ceased, and the patient notes a loss or decrease of several special senses.

Methods

History:
Gather relevant information on patient and family medical history

Baseline Data Collection:

Glucose Monitoring
- Regular assessment of blood glucose levels.

CGM Dexcom
- Continuous Glucose Monitoring for real-time data.

EEG (Electroencephalogram)
- Measure electrical activity in the brain

WAVi
- Assess brain's visual processing capabilities

Neuropsychological Evaluation:
- Utilize standardized tests for cognitive function

Mental Health Metrics
- PHQ-9, GAD-7, MDQ, PSS for comprehensive mental health assessment

Heart Rate Monitor
- Continuous monitoring of heart rate

Physical Examination
- Conduct a thorough physical examination

Implementation:

Ketogenic Diet
- Implement a ketogenic diet intervention
- Monitor dietary compliance and impact

Audiovisual Recording Capacity
- Utilize audiovisual recording for observational analysis.

Instructions on When to Eat
- Provide clear guidelines on meal timing within the ketogenic diet and monitor

Empowering Epilepsy Management: Unveiling the Transformative Impact of Ketogenic Lifestyle Interventions on Seizure Reduction

Figures 1. Continuous Glucose Monitoring. Glucose Levels throughout the day as measured by continuous glucose monitoring (CGM). Above 180 mg/dL and blow 70 mg/dL marked in blue . Below 50 mg/dL marked in red.

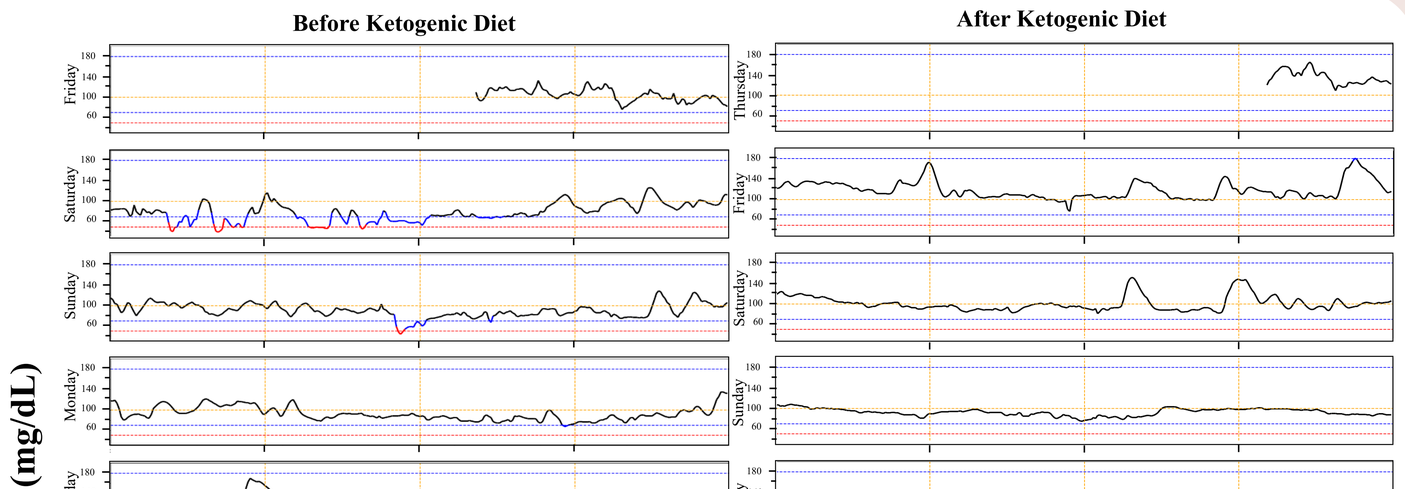

Figure 2: Neuropsychological Assessment results for Participant

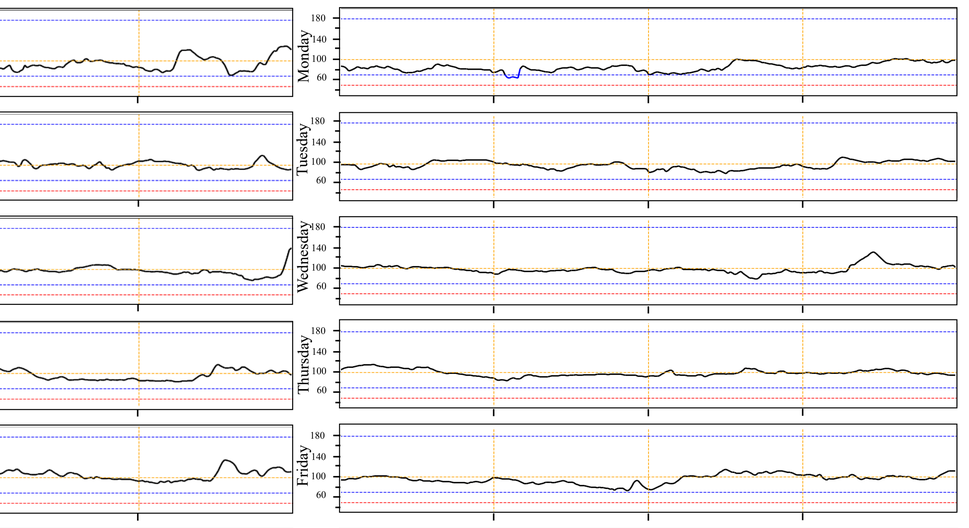

Figure 3: Average CGM tracking over a 24-hour period. Used as control comparison .

Results

- Ketogenic diet normalized blood glucose levels and dramatically reduced hypoglycemic and hyperglycemic events
- Seizure frequency and magnitude decreased

Future Directions

- MRI of brain
  - Lesions, tumors or malformations
- EEG
  - During episodic event
- Oral glucose tolerance test
- Genetic testing

Conclusion/Future Directions

Our case study demonstrates the remarkable efficacy of the ketogenic diet in normalizing blood glucose levels. The observed reduction in seizure frequency and magnitude underscores the potential therapeutic impact of a ketogenic diet in managing conditions associated with epilepsy, offering promising insights for future clinical interventions.