

The Diagnostic Yield of Whole Genome Sequencing for Patients with Epilepsy

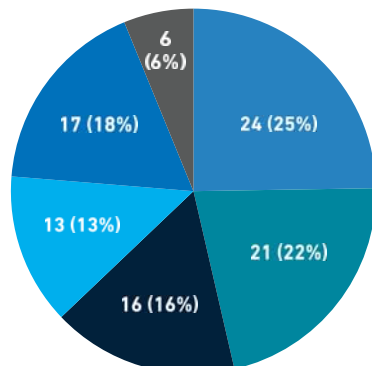
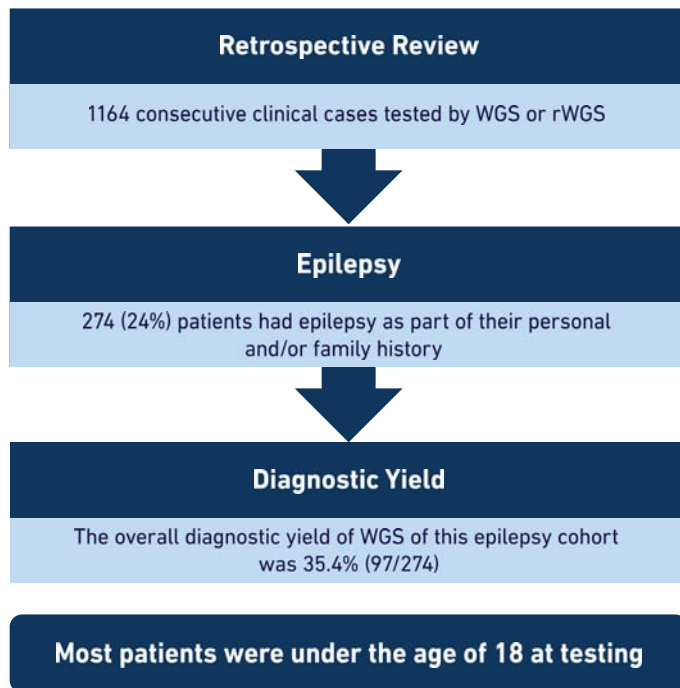
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BACKGROUND

- Whole Genome Sequencing (WGS) is a **comprehensive** test that investigates a large number of genes and multiple variant types.
- WGS is increasingly being adopted as a **first-tier diagnostic tool for various neurodevelopmental disorders** per guidelines from the American College of Medical Genetics and Genomics (ACMG).
- However, there is limited information on the utility of WGS for epilepsy disorders.
- In this study, we reviewed the diagnostic yield of WGS for patients presenting with epilepsy.

RESULTS



METHODS

Study Design: Retrospective review of WGS results

Inclusion Criteria:

- WGS or rapid WGS (rWGS) completed at one clinical laboratory
- Clinical indication includes epilepsy

Analysis:

We reviewed the clinical and genetic data to determine:

- The **frequency of "positive" results** (defined as pathogenic and likely pathogenic) detected by WGS/rWGS
- The **variant types** identified by WGS/rWGS

Most positive results were obtained from rWGS

Type of test for positive results



Variant types included single nucleotide variants (SNVs), copy number variants (CNVs), mitochondrial variants and short tandem repeats (STRs).

Variant type	Number of findings
SNVs	82 (85%)
Mitochondrial	2 (<i>MT-TL1, MT-TV</i>)
Mosaic	1
CNVs	15 (15%)
STRs	2 (<i>CTSB, ATXN80S</i>)
Chromosomal	3 (Trisomy 21 and 45,X)
Mosaic	1
Imprinting	1 (Angelman syndrome)

Conclusions:

- WGS identified a **genetic diagnosis in over 1/3 of patients with epilepsy.**
- WGS detected genetic variations that are often missed by targeted or panel testing.
- Most positive results came from **rapid WGS, which is a time-sensitive option** for critically ill patients.
- Altogether, these data support the use of WGS for patients with epilepsy.**