A Case Report of Creutzfeldt-Jakob Disease in the Outpatient Setting.

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Introduction

Creutzfeldt-Jakob disease (CJD) is a progressive, fatal, neurodegenerative disease caused by infectious protein particles known as prions [1]. While the presentation of the disease can vary based off subtype—acquired, genetic, or sporadic—the clinical presentation of CJD is commonly characterized by rapidly progressive dementia with extrapyramidal dysfunction, cerebellar signs, myoclonus, and/or mutism [2]. CJD is still considered to be relatively rare with a global incidence of 1-2 cases per million people per year [1] and sadly, this devastating disease has no current treatment so most patients will die within 1 year of symptom onset.

This case report illustrates a presentation of CJD from the URMC Memory Care Program, highlighting symptom evolution from early disease to diagnosis and the work-up required to arrive at a diagnosis.

Case

Mr. X is a 71 year old, retired, Caucasian male presenting to the URMC Memory Care Program with complaints of approximately 3-6 months of increasing forgetfulness (e.g. misplacing items, forgetting names of acquaintances), difficulty organizing tasks, and difficulty transitioning between activities. He had no history of seizures, head injuries, or exposures to chemical agents. Family history notable for vascular dementia in a maternal grandfather. Laboratory work-up negative for reversible causes of dementia. Head MRI notable for bilateral parietotemporal lobes.

Results

Serum and CSF autoantibody panel, encephalitis antibody panel, thyroglobulin antibody, C3/C4, and urine heavy metals were all within normal limits.

EEG: Loss of background organization and poorly sustained posterior dominant rhythm. Background with intermittent diffuse delta to theta range slowing with reactivity. Suggestive of moderate encephalopathy.

CSF

<table>
<thead>
<tr>
<th>Color</th>
<th>Clear</th>
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<tbody>
<tr>
<td>Nucleated cells</td>
<td>2</td>
</tr>
<tr>
<td>RBC</td>
<td>0</td>
</tr>
<tr>
<td>Glucose</td>
<td>60</td>
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<tr>
<td>Protein</td>
<td>60</td>
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CSF Phospho Tau/Tau/A Beta 42

A-beta 42 998.4 pg/mL
T-tau 3407/6pg/mL
P-tau 937 pg/mL
ATI 0.23

National Prion Database (CSF Analysis)

RT-QuIC Positive
T-tau >4000
14-3-3 protein Positive
Estimated probability of prion disease >98%

Discussion

The initial diagnosis of CJD in this patient was made based off positive RT-QuIC, 14-3-3 protein, and elevated CSF T-tau. These findings are sufficient to make the diagnosis of probable CJD per the CDC but not a definitive diagnosis. Definitive diagnosis of CJD was later confirmed via post-mortem analysis of autopsy tissue at The National Prion Database. They noted in their final report that while prion disease, likely CJD, was confirmed the type was undetermined.

Timeline from Initial Presentation

**Week 19**: Patient presenting with worsening symptoms of short-term memory and immediate recall. IADLs declining (e.g. no longer managing finances, cooking meals) and reporting more difficulty organizing tasks. MOCA score 20/30 with points lost in delayed recall, clock drawing, and language.

**Week 20**: Repeat head MRI and brain amyloid PET/CT performed for Alzheimer’s disease clinical trial screening. Study negative for amyloid. Head MRI unchanged from previous read.

**Week 22**: Family brought patient back to clinic for ongoing deterioration of function with confusion, irritability, poor concentration, and repetitive, OCD-like behaviors (e.g. repetitively wiping kitchen counters and smoothing out rugs in home). MOCA 14/30 with new deficits in trail making, attention, delayed recall, orientation. Extensive workup negative for reversible causes. MRI notable for gasserian ganglion hypointensity. CSF analysis notable for 3407 pg/mL of tau.

**Week 23**: Neuropsychiatric testing results—RBANS with significantly poor performance in areas of attention (1st percentile), language (4th percentile), immediate memory (1st percentile), and delayed memory (0.4th percentile). He scored well in visuospatial/executive function, language, attention, delayed recall, orientation. Extensive serum and CSF work-up ordered for paraneoplastic disease, autoimmune disease, heavy metals, and prion disease.

**Week 34**: Diagnosis of Creutzfeldt-Jakob disease, variant type was made upon results from National Prion Database.

**Week 46**: Patient died on home hospice.

Timeline Continued

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**Imaging**

**Head MRI**:

*Study addended by the radiologist after diagnosis of CJD. Arrows added indicating gyriform hyperintensity along the bilateral parietotemporal lobes.*

**Brain F-18 FDG PET/CT**:

*Arrows indicate decreased F-18 uptake in bilateral posterior parietal, lateral temporal, and frontal lobes.*

References