Juvenile Parkinsonism in Neuronal Intranuclear Inclusion Disease

Jennifer Cialone, Jayasri Srinivasan, Mahlon Johnson, and Jonathan W Mink

Objective
Parkinsonism is characterized by tremor, rigidity, bradykinesia, and postural instability. While common in adults, juvenile parkinsonism (JP) is rare. (NIID). We report a case of JP due to Neuronal Intranuclear Inclusion Disease (NIID) and review the literature on JP and NIID.

Methods
Single case natural history over 10 years and comprehensive reviews of JP and of NIID.

Results
The male patient was initially seen at the University of Rochester at age 12 years for four year of progressive dysarthria, dysphagia, and clumsiness. He had a history of congenital nystagmus. His examination was notable for tremor, rigidity, bradykinesia and postural instability, consistent with JP. He had negative testing for many causes of JP including Wilson disease, Huntington disease, and mutations in *PINK1* and *PARKIN* genes. The family declined rectal biopsy. He had excellent initial response to levodopa, but subsequently developed dopa-induced motor fluctuations, dyskinesias, psychosis, and dystonia. He also developed autonomic symptoms, seizures, constipation, and sleep disturbance later in the disease course. He ultimately died from respiratory failure. Neuropathology demonstrated large eosinophilic nuclear inclusions, confirming the diagnosis of NIID.

Conclusions
NIID, also known as neuronal intranuclear hyaline inclusion disorder, is a rare neurodegenerative condition. Symptoms usually start in childhood and affect the central, peripheral, and autonomic nervous systems. NIID can be sporadic or familial. In addition to parkinsonism, NIID may cause cerebellar ataxia, chorea, dystonia, nystagmus, pyramidal signs, seizures, cognitive impairment, peripheral neuropathy and autonomic instability. Levodopa-induced dyskinesias are common. Diagnosis is confirmed by antemortem rectal or skin biopsy or postmortem neuropathology.