Wilson’s disease

Wilson’s disease is a rare autosomal recessive genetic disorder caused by mutations in the ATP7B gene, which encodes a copper-transporting ATPase essential for hepatic copper excretion into bile. This defect leads to progressive accumulation of copper in the liver, brain (particularly basal ganglia), cornea, and other organs.

 Key Features Etiology: Mutation in ATP7B gene on chromosome 13.

Inheritance: Autosomal recessive.

Pathophysiology: Impaired hepatic copper excretion → copper overload → hepatocellular and neuronal toxicity.

Clinical Manifestations

Hepatic: Hepatitis, cirrhosis, acute liver failure.

Neurological: Tremor, dystonia, dysarthria, parkinsonism, freezing of gait.

Psychiatric: Personality changes, depression, psychosis.

Ocular: Kayser–Fleischer rings (copper deposits in Descemet’s membrane of the cornea).

 Diagnosis Low serum ceruloplasmin

High urinary copper excretion

Elevated hepatic copper content (biopsy)

Genetic testing for ATP7B mutations

MRI: May show basal ganglia hyperintensities

Treatment

Copper chelators: D-penicillamine, trientine.

Zinc salts: To block intestinal absorption.

Liver transplant: In fulminant hepatic failure.

Visual Cueing for Freezing of Gait in Wilson’s Disease [1)].

 Context Freezing of gait (FOG) is a rare but disabling symptom in Wilson’s disease (WD), typically

appearing in advanced stages or in patients with significant basal ganglia involvement. While visual cueing has been widely studied in Parkinson's disease (PD), its application in WD remains anecdotal and understudied.

 Purpose of Visual Cueing Visual cueing aims to:

Compensate for impaired internal gait initiation by leveraging preserved external visual-motor pathways.

Provide rhythmic or spatial stimuli that bypass dysfunctional basal ganglia-thalamo-cortical circuits.

 Evidence in Wilson’s Disease

Sparse Literature: There are no randomized controlled trials (RCTs) or large observational studies specifically evaluating visual cueing in WD-related FOG.

Case Reports: Some case studies suggest benefit from floor markers or laser lines, similar to strategies in PD.

Mechanistic Rationale: WD affects basal ganglia circuitry similarly to PD, which supports the theoretical use of visual cueing.

 Types of Visual Cues Potentially Useful

Laser shoes / canes: Projecting lines on the ground to step over.

Floor tape markers: Especially useful in home environments.

AR-based systems (experimental): Augmented reality glasses providing dynamic cues in real time.

 Pathophysiology-Based Hypothesis In Wilson's disease:

Copper accumulation leads to damage in the putamen and globus pallidus, regions involved in gait initiation.

Visual cues may help activate alternative networks (cerebellar or parietal) to facilitate step initiation.

 Practical Recommendations Given the low-risk and low-cost nature of visual cueing:

Try simple floor markers in clinical or home settings.

Combine with physiotherapy focusing on gait training and cue responsiveness.

Consider a case series or pilot study if you’re in a clinical setting, to contribute to the literature.

1)
Alencar E Silva R, Fraiman P, de Oliveira Godeiro Junior C. Visual cueing for freezing of gait in Wilson's disease. Pract Neurol. 2025 Jun 15:pn-2025-004564. doi: 10.1136/pn-2025-004564. Epub ahead of print. PMID: 40518261.