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Wilson's Disease: Diagnosis and Treatment

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Wilson's disease is an autosomal recessive disorder that results in copper accumulation and toxicity and occurs in about 1 out of every 40,000 people.[1] As a result of copper deposition in various organs, patients, typically between the ages of 10 and 40 years old, can present with liver, neurological, or psychiatric symptoms. In fact, one fourth to one third of patients initially present with psychiatric and behavioral symptoms.[2, 3] Kinnier Wilson, in his initial case reports, described the behavioral aspects of the disease, which he called "psychical," and noted their presence in 8 of his 12 patients.[4]

Diagnosis and Physical Findings

The Kayser-Fleischer ring, a brownish-green discoloration from accumulation of copper granules deposited in the sclera at the periphery of the cornea, is virtually pathognomonic of Wilson's disease. Wilson's disease often presents in the following ways:

- Psychiatric – the previously psychiatrically "normal" young person can present depression, manic behavior, paranoia, and delusions, but the commonest disturbances are "bizarre behavioral patterns that defy classification."
- Neurologic – the patient may present with slurred or slowed speech, tremors, dystonia, and dysphagia. Motor strength is not affected, nor are there sensory defects.
- Hepatic – the patient may present with hepatitis, chronic cirrhosis, or liver failure.

Positive screening test results include urine copper (over 100 micrograms/24 hour) and serum ceruloplasmin (below 5 milligrams/dl). For any patient in whom the diagnosis is not definitive, the gold standard is liver biopsy (over 2000 micrograms/g dry weight of tissue).

Initial Management and Maintenance Therapy

Wilson's Disease is an unusual genetic disease in that it is quite effectively treated (Table 1). Therefore, even though the disorder is rare, it is important to consider it in differential diagnosis, because failure to treat can lead to permanent damage including psychiatric and behavioral problems. The staple of maintenance treatment is zinc, which has much fewer side effects than previous medications such as

pencillamine. Zinc's use as treatment for Wilson's Disease was discovered when it caused copper deficiency while being studied as an antisickling agent in patients with sickle cell anemia.[6] Zinc acts by inducing intestinal metallothionein, and thus, prevents absorption of copper into the circulation.

Table 1: Anticopper Therapy for Different Categories of Wilson's Disease Patients

Category of patient	Treatment of choice
Initial presentation	
Psychiatric	Tetrathiomolybdate
Neurological	Tetrathiomolybdate
Hepatic	Tientine and zinc
Maintenance therapy	
Maintenance and initial therapy	Zinc
Presymptomatic	Zinc
Pregnant	Zinc
Pediatric	Zinc

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