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Research Article

Clinical Presentation of Wilson's Disease Patients Attending a Tertiary Level Hospital

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Abstract

Background: Wilson's disease is an autosomal recessive disorder of copper metabolism with various clinical presentations.

Objective: The objective of the study was to asses clinical presentation of Wilson's disease patients.

Method: Total 31 suspected patients of Wilson's disease attending the Neurology Clinic, Kokilaben Dhirubhai Ambani Hospital and Medical Research Institute from August 2022 to June 2023 were included in this study and assessed for clinical presentation.

Results: Out of 31 patients with Wilson's disease, 20 (64.51%) were males. Almost 83.87% of the patients belonged to younger age group (10-30 years of age). Five (16.12%) presented with hepatic disease only, 07 (22.58%) with neurological disorders only, 01 (3.22%) with neuro-ophthalmological symptoms and 18 patients (58.01%) with mixed features. Out of 25 patients that had neurological disorders, 03 (12%) were found to have dystonia, 03 (12%) presented with ataxia, 02 (8%) had involuntary tremors of hands and feet and 18 presented with mixed neurological features(68%). 19 patients (61.29%) out of 31had K-F ring visible on slit lamp biomicroscopy. In hepatic presentation only 02 had K-F ring (40%), in neurological presentation 04 had K-F ring (57.14%) and in mixed presentation 13 had K-F ring(72.22%).Twenty-four hour urinary copper excretion was positive (level exceeding 100 mg/dl) in 28 cases (90.32%), whereas serum ceruloplasmin level was found lower than 25 mg/dl in 26 patients (83.87%).

Conclusions: Wilson's disease is more prevalent than previously thought. Neurological manifestation is a fairly common presentation. With appropriate and timely treatment, a significant number of patients improve rapidly.

Keywords: Wilson's Disease; Neurological; Presentation

Introduction

Wilson`s disease is a rare autosomal recessive disorder of copper metabolism, with a prevalence of about 1 in 30,000 people [1]. It is characterized by a decreased biliary copper excretion and a defective incorporation of copper into ceruloplasmin, leading to copper accumulation in brain, liver and kidneys [2]. The clinical presentation of Wilson`s Disease varies widely. During early life, the patient may be asymptomatic but with accumulating copper clinical features begin to appear [3]. Before 10 years of age, 83% patients of Wilson's disease present with hepatic manifestations and 17% with neurological manifestations. After the age of 18 years,75% patient present with neuropsychiatric features and 25% patient develops

liver disease. The clinical categories that encompass majority of neurologic WD are, dysarthric, dystonic, tremor or parkinsonian [4-7]. It is not uncommon for a single manifestation such as tremor, dysarthria, dystonia or less frequently parkinsonism to be present at the initiation of symptoms. As the disease progresses it is typical for complex combinations of neurologic symptoms and signs to coexist in a single patient [8]. During the course of the disease other neurological manifestation include chorea, athetosis, myoclonus, seizures, ataxia, drooling, pyramidal signs and eye movement abnormalities [9,10]. Copper deposits in the limbic region of the cornea known as Kayser-Fleischer rings are seen in nearly 100% of those with neurological WD [11]. The diagnosis of WD is based on the results of several clinical and biochemical tests. Each of the diagnostic tests has its limitations, and only the combination of clinical, biochemical and genetic test provides a powerful and reliable tool for diagnosis of WD [12,13].

Methodology

All patients attending the Neurology Clinic, Kokilaben Dhirubhai Ambani Hospital and Medical Research Institute, Mumbai, India, from August 2022 to June 2023, as suspected case of Wilson's disease were included in the study. A pre-designed proforma was filled, which included a detailed history, neurological examination, systemic examinations, and ocular examination. All patients underwent specific diagnostic evaluation and investigations such as ocular biomicroscopy of the cornea for the presence of K-F ring, estimation of 24- hour urinary excretion of copper and level of serum ceruloplasmin. The diagnosis was based on family history, clinical presence or absence of K-F rings, results of key laboratory tests such as low serum ceruloplasmin level and increased urinary copper excretion. Data was analyzed by Statistical Package for Social Science programme (SPSS).

Results

A total 31 patients with Wilson's disease were seen during the study period, starting from August 2022 to June 2023. 20 (64.51%) were males. Among the total patients, almost 83.87% of them belonged to the younger age group ranging from 10 years to 30 years of age. Only 02 male patient was above 40 years of age (Table 1).

Out of 31 patients, 05 (16.12%) presented with hepatic disease only, 07 (22.58%) with neurological disorders only, 01 (3.22%) with neuro-ophthalmological symptoms and 18 patients (58.006%) with mixed features (Table 2).

Out Of 25 patients that had neurological disorders, 03 (12%) were found to have dystonia, 03 (12%) presented with ataxia, 02 (8%) had involuntary tremors of hands and feet and 18 presented with mixed neurological features (68%) (Table 3).

19 patients (61.29%) out of 31 had K-F ring visible on slit lamp biomicroscopy. In hepatic presentation only 02 had K-F ring (40%), in neurological presentation 04 had K-F ring (57.14%) and in mixed presentation 13 had K-F ring (72.22%) (Table 4).

Twenty-four hour urinary copper excretion was positive (level exceeding 100 mg/dl) in 28 cases (90.32%) (Table 5), whereas serum ceruloplasmin level was found lower than 25 mg/dl in 26 patients (83.87%) (Table 6).

Age (years)	Male	Female	Total	Percentage (%)
0-10	06	03	09	29.03
11-20	08	06	14	45.16
21-30	02	01	03	9.67
31-40	02	01	03	9.67
>40	02	0	02	6.45

Table 1: Age and gender distribution of patients (n = 31).

Clinical presentation	Number	Percentage (%)
Hepatic Only	05	16.12
Neurological Only	07	22.58
Neuro-ophthalmological Only	01	3.22
Mixed	18	58.06

Table 2: Pattern of clinical presentation of patients with Wilson's disease (n = 31).

Neurological features	Number	Percentage
Dystonia only	03	12
Tremor only	02	8
Ataxia only	03	12
Mixed features	17	68

Table 3: Pattern of neurological features of patients with Wilson's disease (n = 31).

Clinical presentation	Frequency of K-F ring (n=19)	Percentage (%)
Hepatic only	2	40%
Neurological only	4	57.14%
Mixed features	13	72.22%

Table 4: Proportion of the presence of K-F ring in different clinical presentations (n = 31).

High 24 hour Urinary Copper (>100mg/dl)	Frequency	Percentage (%)
Total	28	90.32%
Hepatic presentation	5	100%
Neurological presentation	4	57.14%
Mixed presentation	15	83.33%

Table 5: Proportion of high 24-hour Urinary Copper (>100mg/dl) in different clinical presentations (n = 28).

Low Serum Ceruloplasmin level (<25mg/dl)	Frequency	Percentage (%)
Total	26	83.87%
Hepatic presentation	4	80%
Neurological presentation	6	85.71%
Mixed presentation	16	88.88%

Table 6: Proportion of low Serum Ceruloplasmin level (<25 mg/dl) in different clinical presentations (n = 31).

Discussion

Among the total patients, almost 83.87% of them belonged to younger age group ranging from 10 to 30 years of age, which is similar to most of the reports published from various places. It is believed that Wilson's disease is a disease of children, adolescents and young adults [14,15]. 20 patients were males accounting for 64.51% of total cases. There has been no difference in prevalence of the disease in males and females [16]. However, our series has shown higher prevalence of disease in males than in their counterparts.

There were 31 patients with Wilson's disease included in this study. Of these 31 patients, the commonest form of manifestation encountered was neurological (dystonia, ataxia, and involuntary tremors of extremities). This is in contrast to some reports which have quoted hepatic disorders to be the commonest form of presentation in Wilson's disease specially in children [17,18]. A study conducted in Italy by Giacchino., *et al*, reported that almost 50% of Wilson's disease presented as hepatic disorders in children and also found that neurological manifestations were seen more commonly among adults [19]. Neurological disorders seem to be more common among adults in our series. Out of 25 patients that had neurological disorders, 03 were found to have muscular dystonia and 02 had involuntary tremors of hands and feet and 03 presented with ataxia. This pattern of neurological involvement is similar to other reports that have quoted the neurological involvement among adults in Wilson's disease [20]. K-F ring was found in 61.29% of patients. K-F ring may be absent in 15-50% of patients with Wilson's disease with hepatic clinical features. 24-hour urinary copper was found to be high in 28 patients and in 100% of cases with hepatic presentation. Low serum ceruloplasmin was found in 26 patients (83.87%) [21].

Conclusions

Wilson's disease is more prevalent than previously thought. Neurological manifestation is a fairly common presentation. With appropriate and timely treatment, a significant number of patients improve rapidly.

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