NEUROLOGICAL FEATURES AMONG PATIENTS HAVING WILSON'S DISEASE

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ABSTRACT

Background: Neurological features may create confusion during diagnosis of Wilson disease, Parkinson disease and other disease having neurological manifestations.

Objective: To determine the frequencies of different neurological manifestations in patients with Wilson's disease.

Methodology: This was a cross sectional study that was conducted at Department of Medicine, Shaikh Zayed Hospital, RahimYar Khan from 1st January to 31st December 2017. In this study the cases of Wilson's of both genders, with age range of 10 to 30 years, were included. The diagnosis of Wilson's disease was made by the presence of ceruloplasminlevel <0.2 g/L andurinary copper > 40 µg/24h. The cases of psychotic disorders and those with liver disorder were excluded. Data was analysed by using SPSS version 23.

Results: In this study, there were total, 50 cases, out of which 29 (58%) were males and 21 (42%) were females. The mean age at presentation was 19.45±3.67 years and the mean BMI was 17.89±4.47 kg/m^2. Neurological presentations were seen in almost all of the cases and all cases have overlap of more than one neurological complication. The most common neurological symptom was tremors seen in 42 (84%) of the cases, followed by muscle rigidity in 39 (78%) of the cases and dysphagia in 36 (72%) of the cases. Dysarthria and dystonia were noted in 22 (44%) and 18 (36%) of cases, respectively followed by flexed posturing in 4 (8%) of cases.

Conclusion: Neurological manifestations are very common in Wilson's disease and the most common complications are tremors and muscle rigidity.

Key words; Wilson's disease, Tremors, Ceruloplasmin, Neurological, Features

INTRODUCTION

Wilson's disease (WD) is considered as one of the very rare medical entities, which are inheritable and are autosomal recessive.[1,2] These are characterized by the abnormal metabolism of copper due to an inborn error that leads to toxic accumulation of it in different organs of the body including brain, liver and cornea.[1] According to an estimate the prevalence of Wilson's disease is 30/1000000 cases.[2] The number of carriers are thought to be around 1% in the United States.[3] The basis underlying pathology is the altered and defected copper metabolism, which usually affects hepatobiliary system, however it can eventually effect almost half of the body organ systems.[4] The most common clinical scenarios include neurological and hepatic manifestations.[5,6] Neurological dysfunction constitutes the initial clinical manifestation in 40–60% of individuals with Wilson's disease.[5,7] The major clinical symptoms are hypokinesia, slurred speech, abnormal tone of the muscles, in-coordination, tremors, dystonia and dysphagia.[7,8] It can mimic in presentation as Parkinson disease because of the same underlying pathology as the copper typically accumulates in the basal ganglia, that are the affected areas in Parkinson disease as well.[8] As neurological dysfunction constitute the initial clinical manifestation in Wilson's disease, so the early recognition of these symptoms can help in early diagnosis and medical treatment in order to prevent irreversible damage, so the objective of the study was to determine the frequency of different neurological manifestations of Wilson's disease.

METHODOLOGY

Study Design: Cross-sectional study. Settings: Department of Medicine, Sheikh Zayed Hospital, Rahim Yar Khan. Duration of Study: 1st January to 31st December 2017. Sampling Technique: Non-probability,consecutive sampling.

Sample Selection:

Inclusion Criteria:

1. All patients with Wilson's disease (as per-operational definition).
2. Patients 10-30 years of age.
3. Both genders.

Exclusion Criteria:

1. Patients with other psychotic disorders.
2. Patients with chronic liver disease.

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3. Patients not willing to be included in the study.

Wilson's disease: Presence of all these was taken as positive;

- levels of ceruloplasmin<0.2 g/L and
- Urinary copper > 40 µg/24h.

Neurological Manifestations: It include the following :

a). Tremor: An involuntary, somewhat rhythmic, muscle contraction and relaxation involving to-and-fro movements of one or more body parts.

b) Muscle Rigidity: Increased resistance to the passive movement of a limb and the inability to achieve complete muscle relaxation.

c) Dysphagia: In coordination and difficulty in swallowing (assessed on history and clinically).

d) Dystonia: Abnormal tonicity of muscle, characterized by prolonged, repetitive muscle contractions (assessed clinically).

e) Dysarthria: Slow (hypokinetic) and difficult speech (assessed clinically).

f) Flexed posturing: Involuntary flexion of the one or more limbs.

Statistical analysis: The data was entered and analyzed using computer program SPSS version 23.0. Descriptive statistics were applied to calculate mean and standard deviation for quantitative data. Frequencies and percentages were calculated for qualitative data.

RESULTS

In this study, there were total 50 cases, out, of which 29 (58%) were males and 21 (42%) were females. The mean age at presentation was 19.45±3.67 years and the mean BMI was 17.89±4.47 kg/m^2 as shown in table I.

Neurological presentations were seen in almost all of the cases and all cases have overlap of more than one neurological complication. The most common neurological symptom was tremors seen in 42 (84%) of the cases, followed by muscle rigidity seen in 39 (78%) of the cases and dysphagia in 36 (72%) of the cases.

Table I: Demographics of study subjects (n=50)

Variable	Mean	Range
Age (years)	19.45±3.67	10-30
BMI(kg/m^2)	17.89±4.47	15-26
Duration of symptoms (months)	7.56±3.34	1-12

Dysarthria and dystonia were seen in 22 (44%) and 18 (36%) of cases respectively followed by flexed posturing in 4 (8%) of cases as in table II.

Table II: Neurological features among patients with Wilson's disease (n=50)

In-Hospital Outcomes	Number	Percentage
Tremors	42	84%
Muscle rigidity	39	78%
Dysphagia	36	72%
Dysarthria	22	44%
Dystonia	18	36%
Flexed posturing	4	8%

DISCUSSION

Wilson's disease is one of the serious metabolic disorders of the copper and which can ultimately store in different parts of the body and its deposition in the brain and its results of wide range of the neurological symptoms is of great concern as it can significantly affect the function and mental status and add to unbearable morbidity in such cases.[6, 9] Tremors, muscle rigidity and memory loss are considered as the major symptoms.

In the present study the neurological presentations were seen in almost all of the cases and all cases has overlap of more than one neurological complication. The most common neurological symptom was tremors seen in 42 (84%) of the cases, followed by muscle rigidity seen in 39 (78%) of the cases and dysphagia in 36 (72%) of the cases.

Dysarthria and dystonia were seen in 22 (44%) and 18 (36%) of cases followed by flexed posturing in 4 (8%) of cases respectively. These findings were also supported by the results of the previous studies.[7-9] According to a study conducted by Khan A et al, which reported frequencies of the neurological manifestations almost similar as was seen in present study in cases of Wilson's disease, which were seen as follows; tremors (86.7%), muscle rigidity (80.0%), dysphagia (66.67%), dystonia (46.7%), dysarthria (46.7%), and flexed posturing (20.0%).[9] These findings were also supported by the studies done by Bruha T et al,[10] and Huster D et al,[11] where they also revealed that tremors, muscle rigidity and dystonia were the major neurological complications seen in such cases.

The other most important findings along with this were slurring of speech and memory loss; which were not studied in the present study but were well reported.[10-11]

CONCLUSION

Neurological manifestations are very common in Wilson's disease and the most common complications are tremors and muscle rigidity. It is suggested that in cases having above mentioned neurological manifestations, the physician must consider Wilson's disease in differential diagnosis.

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