

# A Descriptive Investigation of the Prevalence of Neurological Disorders in People Treated Hemodialysis for End-Stage Renal Disease

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## ABSTRACT

**Objectives:** Patients with end-stage renal disease (ESRD) who were receiving hemodialysis were the subjects of a study to determine the neurological effects of the treatment.

**Methodology:** ESRD patients at the Institute of kidney diseases hayatabad peshawar were the subjects of this descriptive research, which ran from Jan to Dec 2021. Before participating in the trial, all Chronic Kidney Disease (CKD) patients had been on Hemodialysis (HD) for at least six months. HD patients were monitored for a total of six months in this study. Neurological events were observed and recorded at this period. All patients on HD, regardless of gender or age, were included in this research, which was conducted between the ages of 17 and 77. In this research, patients under the age of 15 years, those with acute renal failure, congestive cardiac failure, cirrhosis of the liver, malignancy, disseminated intravascular coagulation, sepsis, meningitis, or encephalitis, were all ruled out as candidates for inclusion. The data was analysed using SPSS version 2.2.

**Results:** Intradialytic hypotension, Cerebrovascular accident, Encephalopathy, Dialysis dementia, Neuropathy, Dialysis disequilibrium, Reversible leukoencephalopathy, Central pontine myelinosis, Autonomic dysfunction, and Myopathy were the most common neurological consequences.

**Conclusions:** Our patients on hemodialysis suffer from the most prevalent neurological complication: Intradialytic hypotension. While the long-term result and prognosis of this group may be affected by cerebrovascular illnesses and Dialysis dementias, it is important to examine them as soon as possible.

**Keywords:** neurological problems, (ESRD), frequency, hemodialysis, end-stage renal disease.

## INTRODUCTION

Chronic kidney disease (CKD) is a severe ailment that is on the rise across the world HD is the most common modality of Renal Replacement Therapy (RRT), accounting for about 92.4 percent of all ESRD patients on RRT<sup>1</sup>. HD affects patients in a variety of ways. A number of problems and side effects need urgent attention and effective management of this disease. Most prevalent complications of HD include cardiovascular and neurological, as well as risk of peptic ulcer bleeding and infections such as viral hepatitis and hepatitis B. 2-3. It is the most prevalent cause of death among people with ESRD, accounting for almost half of all sudden cardiac deaths<sup>4</sup>. Patients with HD may have neurological symptoms that should never be taken for granted. Both peripheral and central neural systems may be affected. Some of the most devastating clinical outcomes of urinary incontinence include uremic encephalopathy, neuropathy, atherosclerosis and myopathy<sup>5</sup>. It's difficult to get a clear picture of the incidence of neurological problems in Pakistan since our population is so small and our studies are so few and far between<sup>6</sup>. The results of this research might help us better understand the neurological issues and help us better manage the time needed to detect and treat such a problem<sup>7</sup>.

## METHODOLOGY

The Institute of kidney diseases hayatabad peshawar performed a descriptive research from Jan to Dec 2021 among patients with end-stage renal disease (ESRD). The Ethical Review Board of a Institute of kidney diseases hayatabad peshawar gave its blessing to this research, which was then carried out (ERB). Patients who had been accepted into the trial and met the inclusion criteria had been informed of the study's scope and rationale. Informed permission was obtained from each participant in writing. Prior to participating in the trial, all participants had been on HD for at least six months. HD patients were monitored for a total of six months in this study. Neurological events were observed and recorded at this period. This trial included all HD patients, ages 17 to 77, who had been on the drug for at least a year. Study participants under the age of 15, as well as those with acute renal failure, cirrhosis of the liver, malignancy and disseminated intravascular coagulation (DIC) were not included. In order to analyse the data, SPSS version 2.2 was used..

## RESULTS

There were a total of 80 patients. There were 60 men and 20 women in all (Fig 1). The ratio of males to females was 1 to 177. There were an average of 37 Hemodialysis sessions per patient. Of the 61 patients who had a neurological problem (40.2 percent). Intradialytic hypotension was the most common neurological consequence, followed by Cerebrovascular accident, Encephalopathy, Dialysis dementia, Neuropathy, Dialysis disequilibrium, Reversible leukoencephalopathy, Central pontine myelinosis, Autonomic dysfunction, and Myopathy. Figures and tables are used to illustrate these issues.

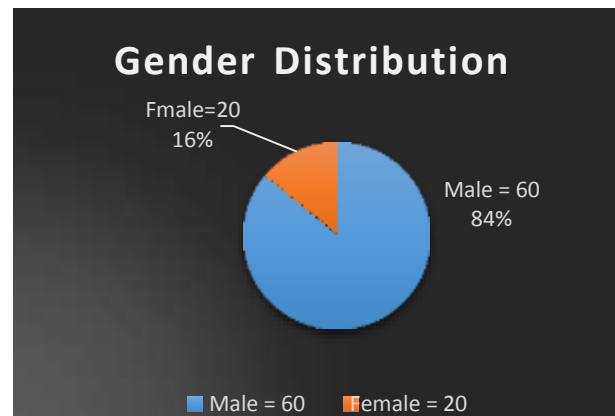


Fig. 1: Distribution of ESRD patients on HD according on gender

Table 1: Percentage of HD patients with different Neurological issues

S. No.	Neurological complication	Percentage
1	Intradialytic hypotension	20%
2	Cerebrovascular accident	15%
3	Encephalopathy	15%
4	Dialysis dementia	20%
5	Neuropathy	10%
6	Dialysis disequilibrium	8%
7	Reversible leukoencephalopathy	04%

8	Central pontine myelinosis	4%
9	Autonomic dysfunction	2%
10	Myopathy	2%
11	Total	100%

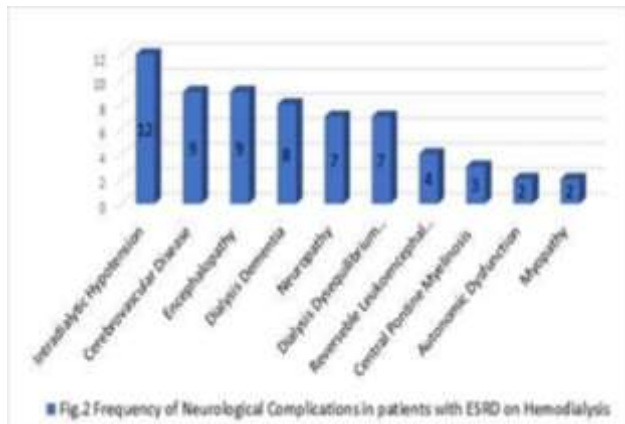


Fig. 2: ESRD patients on HD suffer from neurologic complications.

### DISCUSSION

Chronic renal disease adds to CV risk factors for cerebral haemorrhage. Many CKD patients die from stroke CVA/stroke incidence rose three months before HD<sup>15</sup> and peaked 5-8 times after HD<sup>8</sup>. 530 dialysis patients suffered strokes. In the first two years of HD, the incidence rate was

20.9. Comparables were discovered<sup>9</sup>. Prior stroke patients weren't excluded from CHOICE, increasing incidence. 33 strokes per 1000 patient years were found in URDS Dialysis Morbidity and Mortality Studies (3.3 per 100) <sup>10</sup>. In Spain<sup>18</sup>, HD patients had 2.4 strokes per 102 patient-years in the first three years. Before dialysis and first-year incidence were not provided<sup>11</sup>. Stroke patients on hemodialysis were 5-10 times more common than non-ESRD patients. Our results are similar to a previous research that found an increase in strokes among hemodialysis patients HD produces neurosymptoms. In a study of 270 hemodialysis patients, weariness, Intradialytic Hypotension, cramping aches and pains, and post-dialysis dizziness were common. IDH prevalence was 7.5%-12.3% in a large dialysis facility's BP data stratification IDH doubles one-year mortality<sup>12</sup>. IDH was associated to stroke, myocardial infarction, cerebrovascular accident, and cardiovascular-related mortality when it was linked to thrombosis, myocardial infarction, and fluid overload or heart failure. Cognitive impairment, moderate to severe, is most common<sup>13</sup>. Dialysis patients' cognition can only be studied cross-sectionally. Fazekas et al.<sup>26</sup> compared 30 dialysis patients to 29 controls. 18 HD patients (60%) exhibited cognitive impairment but no controls. 30% of HD patients exhibited cognitive impairment, compared to 7% of dialysis patients<sup>27</sup>. Dialysis patients have an unrecognised risk of cognitive damage, say two studies. We confirmed the worldwide study's findings<sup>14</sup>.

4.2 % of over-63 dialysis patients developed one-year dementia, a Tokyo research found. After one year, dialysis patients over 64 were 7.8 times more likely to have multi-infarct dementia than other seniors<sup>28</sup>. US Renal Data System clinical and administrative data are insufficient to evaluate dementia in ESRD patients. Despite this, the incidence is high<sup>15</sup>.

Studies relate renal function and HD<sup>29</sup>. Renal transplant and non-dialysis uremic patients experienced higher cognitive impairment than HD patients. Previous studies found HD patients had worse cognitive function than controls. A recent U.S. dialysis research found 8.6 for white females and 5.9 for white men<sup>32</sup>.

After a stroke, 33% had dementia. Our research excluded stroke patients<sup>16</sup>. 20-30% of HD sessions had IDH, according KDOQI<sup>34,35</sup>. BP fluctuations affect healthy and renal patients<sup>36</sup>, according to research. IDH increases the risk of myocardial infarction, death, heart failure hospitalisation, fluid overload, and cardiovascular mortality. A cohort study of 113,255 HD patients showed a U-shaped connection between HD mortality and intradialytic BP variation. When diastolic and systolic blood pressures dropped more than 15 and 30 mmHg, mortality increased. Greater mild reductions in delta systolic and diastolic blood pressure improved survival. 37% of people had IDH<sup>17</sup>.

### CONCLUSION

Hemodialysis patients suffer from intralytic hypotension, which is the most prevalent neurological consequence in our group. The prognosis and long-term outcome of this group might be affected by cerebrovascular disease and Dialysis dementia if they are detected sooner than predicted.

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