

Comparing Hemodialysis and Peritoneal Dialysis Patients for Gastrointestinal Symptoms

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ABSTRACT

Objective: The purpose of this research was to compare gastrointestinal (GI) symptoms in ESRD patients receiving PD and HD to see whether there were any significant changes.

Methods: After the ethical approval from the institute review board, this cross-sectional study was conducted at Shahida Islam Medical Complex, Lodhran. From 01/01/22 to 30/06/22. A modified 15-item gastrointestinal symptom rating scale (GSRS) questionnaire was used to assess GI symptoms; this questionnaire included questions on eating dysfunction. Age, a etiology of ESRD, and most recent adequacy evaluation of dialysis were collected through the follow-up database, patient interviews, and chart reviews.

Results: Total seventy patients were included in the present study, N=35 was on hemodialysis and N=35 on peritoneal dialysis. HD and PD patients were similar with respect to age, sex, the occurrence of diabetes mellitus, and average dialysis duration. In ESRD patients' overall prevalence of GI symptoms (GSRS >1) was 68.5% (48/70 patients). Patients with a GSRS > 1 were more common among those with HD group (28/35; 80%) than those with PD (57%; 20/35) (P 0.058*). In the HD group, more patients suffered from abdominal pain, constipation, and diarrhea (74%, 60% and 68.5%, respectively), compared with those in the PD group (34%, 28.5% and 32%, respectively; P value is 0.003, 0.001, and 0.008 respectively)

Conclusion: Gastrointestinal (GI) symptoms vary in frequency, intensity, and variety across HD and PD individuals.

Keywords: Gastrointestinal symptom, Hemodialysis, Peritoneal dialysis, End-stage renal disease

INTRODUCTION

A persistent and irreversible decline in the number of nephrons and kidney functions characterizes chronic kidney disease (CKD), a pathophysiological process with several etiological origins that often results in end-stage renal disease (ESRD). Renal failure causes uremia, a clinical and laboratory condition that represents the malfunction of many organ systems, including the digestive system (1). Disorders of the digestive tract affect a sizable percentage of the population and have a negative impact on quality of life (2). In addition, 32%-85% of patients on dialysis have Gastrointestinal (GI) symptoms (3, 4). This is especially true for individuals with ESRD. Increased levels of uremic toxin, the impact of dialysis, a change in diet and lifestyle, or the drugs used to treat a disease may all contribute to the development of GI symptoms (5, 6). Regular hemodialysis (HD) patients have a much greater risk of gastrointestinal (GI) problems than normal population (7, 8), although they have less symptoms than the 85% of peritoneal dialysis (PD) patients who are also reported to have GI issues (7). G.I. symptoms in PD patients most often include dyspepsia, gastroesophageal reflux and eating dysfunction (9). However, few studies have directly or fully investigated the differences between PD and hemodialysis (HD) and pre-dialysis patients in terms of these symptoms (5, 6, 10). It is still debatable whether or whether people with PD are more likely to have gastrointestinal issues. Patients with PD have an astoundingly high prevalence of gastrointestinal problems. Patients with HD and PD had different rates of GI symptoms, as measured by a GSRS > 1, in Chinese research. When compared to PD patients, HD patients were more likely to have gastrointestinal issues such as constipation, stomach discomfort, and diarrhea. Reflux was more common in PD patients than in HD individuals. Patients with PD also reported more severe symptoms of reflux and eating disorder, whereas those with HD reported more severe gastrointestinal discomfort, diarrhea, and constipation (10). So, the purpose of this research was to compare gastrointestinal (GI) symptoms in ESRD patients receiving PD and HD to see whether there were any significant changes.

METHODOLOGY

After the ethical approval from the institute review board, this cross-sectional study was conducted at Shahida Islam Medical

Complex, Lodhran. from 01/01/22 to 30/06/22. Participants were inpatients and outpatients with active PD or HD who had been on dialysis for at least three months. Patients were not allowed to take part in the trial if they had dementia, a serious viral infection, hepatocholecystopathy, peritonitis within the last three months, unstable glucose levels or blood pressure, or were reluctant to participate. Everyone who participated in the research gave their informed permission. Participants were asked to rate the frequency and severity of their GI symptoms during the last two weeks using a modified version of the gastrointestinal symptom rating scale (GSRS) questionnaire (11). The Likert scale ranges from 1 (no discomfort) to 7 (extreme discomfort) were used to record the patient GI symptoms severity. There are five aspects to the items: stomach discomfort (three items), reflux (two items), indigestion (four items), diarrhea (three items), and constipation (three items). An eating dysfunction component, similar to the GSRS (12), was also included, covering topics such as early satiety, difficulty with eating regular meals, and postprandial discomfort. The average of the elements for a given syndrome, ranging in point value from -1 to 7, was used to derive a dimension score. Patients were interviewed and/or their medical records reviewed to collect data on demographics such as age, condition causing ESRD, diabetes status, and dialysis duration. We used the follow-up database to get the most current serum Kt/V urea, an indicator of dialysis efficacy. The Daugirdas formula was used to get the Kt/V (13). The data was analyzed using SPSS 26. Comparing continuous variables between HD and PD patients was done using Student's t-tests, while comparing categorical variables was done using Pearson's 2 or Fisher's exact tests. If the data are continuous and regularly distributed, was displayed as a mean and standard deviation; if they are categorical, was shown as a percentage. The threshold for statistical significance was set at P ≤ 0.05.

RESULTS

Total seventy patients were included in the present study, N=35 was on hemodialysis and N=35 on peritoneal dialysis. Table 1 represent the demographic and clinical parameters of the patients in both study groups. Mean ± S. D of the participants age in both study groups was 56.6±5.5 and 55.9±5.8 years. In both study groups females were predominant with 69% in HD and 57% in PD

group. HD and PD patients were similar with respect to age, sex, the occurrence of diabetes mellitus, and average dialysis duration. Chronic glomerulonephritis (43% in HD and 40% in PD) was the most frequent cause of ESRD, followed by hypertensive nephropathy and diabetic nephropathy. In ESRD patients' overall prevalence of GI symptoms (GSRs >1) was 68.5% (48/70 patients). Patients with a GSRs > 1 were more common among those with HD group (28/35; 80%) than those with PD (57%; 20/35) (P 0.058*) (Figure 1). In the HD group, more patients suffered from abdominal pain, constipation, and diarrhea (74%, 60% and 68.5%, respectively), compared with those in the PD group (34%, 28.5% and 32%, respectively; P value is 0.003, 0.001, and 0.008 respectively) (Figure2). PD group participants had a higher prevalence of reflux (80% vs 46%, P < 0.008). and indigestion symptoms (77% vs 57%, P < 0.006) than HD patients. 16 HD patients, compared to 11 PD patients, reported having four or more symptoms (Table 3), even though most patients reported experiencing just one to three symptoms. Between these two groups, there was a no significant difference in in diversity of gastrointestinal symptoms (p=0.287).

Table 1: Demographic and clinical parameters of the study groups

| Parameters | HD (n=35) | PD (n=35) | P value |
|--|-----------|-----------|---------|
| Age | 56.6±5.5 | 55.9±5.8 | 0.703 |
| Gender | | | |
| Male | 11 (31%) | 15 (43%) | 0.292 |
| Female | 24 (69%) | 20 (57%) | |
| Diabetes | 21 (60%) | 20 (57%) | 0.744 |
| Disease leading to chronic renal failure | | | |
| Chronic glomerular nephritis | 15 (43%) | 14 (40%) | |
| Hypertensive nephropathy | 9 (26%) | 7 (20%) | |
| Diabetic nephropathy | 7 (20%) | 8 (23%) | |
| Polycystic kidney disease | 4 (11%) | 6 (17%) | |
| Duration of dialysis | 48.5±6.4 | 51.8±7.8 | 0.5 |
| Kt/V | 133.6±5.9 | 63.97±4.3 | 0.000 |

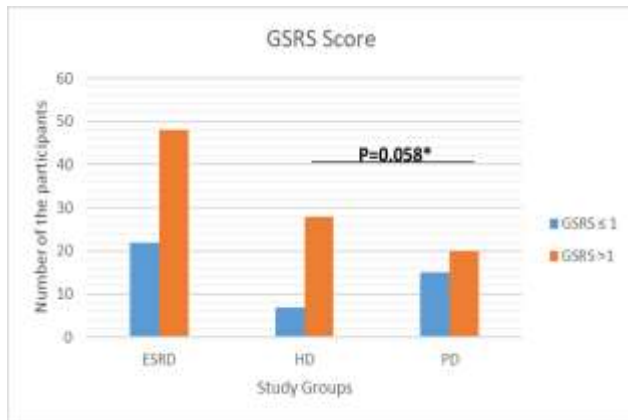


Figure 1: GSRs score

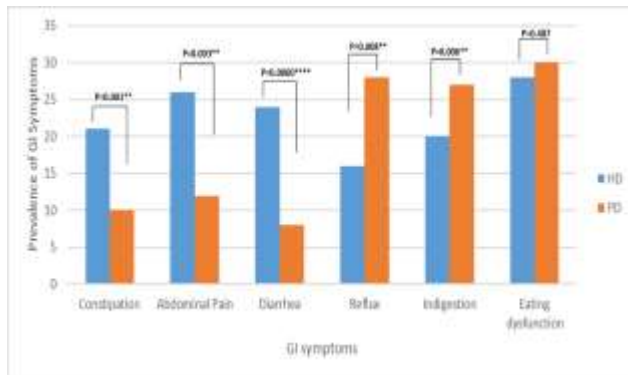


Figure 2: Prevalence of gastrointestinal symptoms

Table 2: Number of GI symptoms according to the GSRs score

| Group | No of Symptoms | | | P value |
|-------|----------------|-----|-----|---------|
| | 0 | 1-3 | 4-5 | |
| HD | 5 | 14 | 16 | 0.263 |
| PD | 3 | 21 | 11 | |

DISCUSSION

Similar to recent research on individuals with chronic renal disease (14), the current study found that 68.5% of dialysis patients had gastrointestinal (GI) symptoms. In HD patients, however, these manifestations are much more common than in PD patients. Prior research has shown varying prevalence's of GI symptoms among HD patients (32%-79% (15, 16)) and PD patients (42%-66% (17)), and 73.6% of continuous ambulatory peritoneal dialysis (CAPD) patients exhibited abnormal upper gastrointestinal endoscopic results (18). Our findings, however, suggest a greater frequency among HD patients, despite the fact that the sample sizes were comparable. The use of different questionnaires is a possible explanation for these inconsistencies. This study's findings imply that HD and PD patients had significantly different levels of gastrointestinal distress. In keeping with prior observations (3, 19), a larger percentage of HD patients reported experiencing stomach discomfort, diarrhea, and constipation. Chachati et al (20) noted a significant frequency of upper GI pathology, including ulcers, during the first two years of HD, which dropped with HD duration, suggesting that peptic ulcers may be related to the stomach discomfort. The risk of peptic ulcer recurrence was also reduced in patients receiving HD for longer periods of time, according to a separate study (21). Hypotensive episodes, which are common during the beginning phases of dialysis, may make HD patients more vulnerable to ischemic colitis (17). Consistent with previous research using the Rome II questionnaire to assess GI symptoms, the present study found a high frequency of diarrhea among HD patients. Nonetheless, another research revealed a considerably lower prevalence; this one also identified a gender difference, with women reporting more negative symptoms (19). Similar to the results of Yasuda et al. (22), who found that constipation was more than three times more frequent in HD compared to CAPD patients, diarrhea was the most common and severe presenting GI symptom among HD patients. Constipation is a common complaint among people with HD, and it may be a result of the clinic-imposed dietary and hydration restrictions, the lack of activity, and the use of specific drugs, phosphate binders in particular (23).

Patients with PD in our study also had more severe cases of reflux and eating difficulties, which is consistent with prior research. The process of PD involves filling the abdominal cavity with dialysate fluid, which raises intra-abdominal pressure (24), increases the frequency of acid reflux episodes (25), and decreases the pressure in the esophageal sphincter, all of which may worsen the aforementioned symptoms. A separate pathophysiological component for esophageal acid exposure is PD (26). Also, the glucose dialysate may have a metabolic function in gastric emptying (27), and PD patients often have delayed gastric emptying (28, 29). One of the primary causes of malnutrition in global cross-sectional research of 224 people with CAPD revealed that 33% were not well-nourished and 8% had severe malnutrition was eating dysfunction (30), which may have stemmed from food aversion, early satiety, and alterations in taste and smell. Hypergastrinemia, increased levels of ammonia and inflammation, and impaired local or systemic circulation are all possible causes of eating disorders (31).

This is the only research that we are aware of that explicitly compares the range of GI symptoms experienced by people with HD and PD in Pakistan. It was shown that dialysis patients often had gastrointestinal (GI) symptoms, but that the most significant symptoms surprisingly varied across individuals receiving various dialysis regimens. Although most people had very mild symptoms, almost 10% had more than three gastrointestinal issues, and this was more common in HD patients than PD patients. The exact cause is unknown, however it may be related to alterations in

blood pressure and heart rate, a lag in the stomach's emptying process, the decline of any remaining renal function, or insufficient dialysis, such as protein-bound uremic toxin that is not removed by HD.

CONCLUSION

Constipation, stomach discomfort, and diarrhea were more common and severe in HD patients, and reflux was more noticeable in PD patients, although both HD and PD patients had a high incidence of GI symptoms. There is some discrepancy between our findings and those of earlier research; thus, it is important to confirm these findings in a larger sample of dialysis patients.

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