The Effect of Peritoneal Dialysis on Balance and Falling Risk

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AIM

Due to aging and complications of chronic kidney disease physical limitation, postural imbalance, and increased risk of falling are the most important cause of mortality and morbidity in patients with peritoneal dialysis (PD). However, peritoneal dialysis itself may contribute to balance disorders and falling risk.

The aim of this study is to investigate whether there is an increase in the risk of postural balance disorders and falling in patients with peritoneal dialysis compared to healthy individuals after peritoneal dialysis. In addition, it is aimed to evaluate whether there is a difference in the parameters of postural balance before and after peritoneal dialysis practice in patients with PD.

METHODS AND MATERIALS

Thirty-one (11 female, 20 male) PD patients and 51 (33 female, 18 male) healthy individuals were included in the study. Patients undergoing peritoneal dialysis for at least 3 years were included in the study. The mean age of all cases was 48.84 ± 14.29 years.

Patients with visual and hearing problems that might cause balance disorder, orthopedic, rheumatologic or neurological diseases that prevent standing over the postural balance device, using assisting devices such as canadian or walker, patients who had surgery and individuals over 65 were excluded from the study.

Clinical evaluation

Sociodemographic characteristics of all cases were demonstrated. Postural balance was evaluated with computer assisted posturography device (Tetrax® Interactive Balance System) and Berg balance scale. Stability scores, weight distribution index and falling index were evaluated on posturography device.

Statistical analysis

All evaluations were performed in SPSS-24.0 package. Mann-Whitney U test and Wilcoxon test were used for intra-group comparison. P <0.05 was considered significant.

RESULTS

The mean age of all cases was 48.84 ± 14.29 years. Demographic characteristics of patients with PD and health control group are shown in Table 1.
The Berg balance total score was significantly lower in PD patients (p = 0.003) and the falling index was higher (p = 0.000) than in healthy individuals. Stability scores were significantly worse in PD patients than in healthy individuals (p <0.05). There was no significant difference in weight distribution index (p> 0.05) (Table 2).
In the comparison before and after peritoneal dialysis, the stability index in eyes with closed head anterior position was significantly worse before application (p = 0.017). No significant difference was found in terms of falling index, weight distribution index and other stability indices before and after application (p> 0.05) (Table 3).

Table 1: Demographic characteristics of peritoneal dialysis patients and healthy controls

	Peritoneal dialysis (N=31)	Healty control (N=51)	p
Age (Mean ± SD)	55.03±13.73	42.65±12.14	0.001**
Gender (Female/Male)	11/20	33/18	0.010*

SD: Standard deviation
** p <0.01
* P <0.05

Table II. Mean overall stability scores, weight distribution and falling indexes and Berg Balance Scores of peritoneal dialysis patients and healthy controls

	Peritoneal dialysis (Mean±SD)	Healty control (Mean±SD)	p
Overall stability scores			
Head straight			
Eyes open	22.80±12.16	18.77±10.65	0.045*
Eyes are closed	31.93±19.72	19.88±7.86	0.000**
With sponge			
Eyes open	27.98±14.01	16.14±6.99	0.000**
Eyes are closed	39.44±18.16	23.61±8.19	0.000**
Head right	35.56±18.51	22.89±8.79	0.000**
Head left	37.39±20.03	22.82±8.51	0.000**
In the back	36.06±20.79	23.20±8.54	0.001**
Head in front	35.63±19.17	23.28±11.06	0.000**
Weight Distribution Index			
Head straight			
Eyes open	5.53±3.51	6.55±3.12	0.103
Eyes are closed	6.10±3.65	6.29±3.10	0.609
With sponge			
Eyes open	6.78±4.30	8.00±4.21	0.167
Eyes are closed	7.02±3.77	7.37±3.83	0.651
Head right	5.96±3.27	6.46±3.24	0.547
Head left	6.46±3.97	6.28±3.17	0.959
In the back	5.60±2.93	6.74±3.34	0.139
Head in front	5.66±2.59	5.64±2.80	0.981
falling Index	71.24±27.55	43.23±27.21	0.000**
Berg Balance Score	16.58±3.26	31.73±17.42	0.003**

Table 3. Mean general stability scores, weight distribution and falling indexes of peritoneal dialysis patients before and after dialysis

	Before dialysis (Mean±SD)	After dialysis (Mean±SD)	p
Overall stability scores			
Head straight			
Eyes open	22.80±12.16	18.77±10.65	0.045*
Eyes are closed	31.93±19.72	19.88±7.86	0.000**
With sponge			
Eyes open	27.98±14.01	16.14±6.99	0.000**
Eyes are closed	39.44±18.16	23.61±8.19	0.000**
Head right	35.56±18.51	22.89±8.79	0.000**
Head left	37.39±20.03	22.82±8.51	0.000**
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In the back	5.60±2.93	6.74±3.34	0.139
Head in front	5.66±2.59	5.64±2.80	0.981
falling Index	71.24±27.55	43.23±27.21	0.000**

CONCLUSION

Postural balance disorders are seen in peritoneal dialysis patients compared to healthy individuals, however we think that dialysis does not have any additional negative contribution to balance disorder and risk of falling down