

# Complications during Haemodialysis

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## ABSTRACT

**Aim:** To determine the frequency of different complications during haemodialysis.

**Methods:** This prospective study was conducted at Nephrology section of Nishtar Hospital, Multan from July 2012 to January 2013. A total of 227 patients were included in the study.

**Results:** The most frequently observed complications were depressive illness, vomiting, fever, itching and hypotension. The causative relations of the complications with other parameters were assessed.

**Conclusion:** The results of this study revealed a very high frequency of the complications associated with maintenance haemodialysis.

**Keywords:** Acute renal failure, Chronic renal failure, haemodialysis

## INTRODUCTION

Chronic renal failure may be defined as a glomerular filtration rate (GFR) below 30ml per minute<sup>1</sup>. Symptoms and complications of uremia often occur when GFR is < 15 ml per minute. Chronic renal failure affects every aspect of life of the patients who suffer it. Over 165000 patients in United States were treated for end stage renal disease during 1990<sup>2</sup>. Patients with end stage renal disease require replacement treatment. This can be provided by maintenance haemodialysis, peritoneal dialysis or kidney transplantation. In Europe, over 250/million populations are given replacement treatment for end stage renal failure. Only about 30% of these patients undergo renal transplantation, which is considered as the gold standard of renal replacement therapy<sup>3</sup>.

The dialysis is only a part of end stage renal management because it cannot replace all the improvement functions of kidney. During haemodialysis the patient may develop complications, e.g. many factors like size of extracorporeal circulation, degree of ultra-filtration, changes in serum osmolality, autonomic neuropathy and alteration in body temperature due to dialysis temperature<sup>4</sup>.

The clinical features include shivering with anaphylactic reaction of varying intensity from mild respiratory distress to anaphylactic shock. It is because of substance released by extra-corporeal circuit and some patients are thought to be intolerant of dialysis membrane made up of cuprophane, which may be due to brisk complement activation<sup>5</sup>.

Disequilibrium syndrome is due to rapid flux in osmolality, with haemodialysis. The clinical features include confusion, clouding of consciousness and fits. Mechanical and estrogenic complications are less common with improved equipment. These complications are air embolism, haemodialysis, blood leak and contaminated dialysate. Complications

related to vascular access problems are infection at the site of AV fistulae<sup>6</sup> or infection due to subclavian or femoral vein catheterization, stenosis of fistula, haemorrhage, thrombosis, inflammatory complications, aneurysm and undesirable consequences of fistulae<sup>7</sup>.

## MATERIAL AND METHODS

This prospective study was conducted at Nephrology section of Nishtar Hospital, Multan from July 2012 to January 2013. A total of 227 patients were included

## RESULTS

Out of 227 patients, 123(54.2%) were male and 104(45.8%) were female. Mean age of the patients was 33.3±10.5 ranging from 13-65 years. Psychological complications were observed in 180 patients. The most common complication was depressive illness was observed in 140(61.6%) (80 male, 60 female) patients. Impotence was found in 40(17.8%) patients. Shivering was found in 59(57.3%) males and 44 (42.7%) female patients whereas fever was seen in 63(62.4%) males and 38 (37.6%) females.

Table 1: GIT related complications

Complication	Male	Female	Total
Vomiting	60 (60%)	40 (40%)	100
Pain abdomen	04 (40%)	06 (60%)	10
Nausea	03 (40%)	02 (60%)	05
Haematomesis	01 (50%)	01 (50%)	02

Table 2: Cardiovascular complications

Complication	Male	Female	Total
Vomiting	60 (60%)	40 (40%)	100
Pain abdomen	04 (40%)	06 (60%)	10
Nausea	03 (40%)	02 (60%)	05
Haematomesis	01 (50%)	01 (50%)	02

Table 3: Neurological complications

Complication	Male	Female	Total
headache	5 (35.7%)	9 (64.3%)	14
Fits	3 (37.5%)	5 (62.5%)	08
Disequilibrium	4 (57.1%)	3 (42.9%)	07
Dementia	3 (60%)	2 (40%)	05

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## DISCUSSION

The major renal replacement therapy is haemodialysis worldwide in the management of end stage renal disease<sup>8,9</sup>. It is either sole replacement therapy or prior to renal transplantation. The commonly observed GIT related complications during haemodialysis are vomiting, pain in abdomen and haematemesis, 48% of the patients had vomiting during or after dialysis. These results are comparable to the results of a study<sup>8</sup>. Heparinization during haemodialysis can precipitate upper gastrointestinal bleeding responsible for haematemesis, though it is not a very common problem. In present study, 4 patients during study period experienced the upper GI bleeding. International data are also documenting the low incidence of haematemesis as the complication of maintenance haemodialysis<sup>9</sup>.

In present study the complications of the haemodialysis occurred in 80% of the patients, either a major one or a minor. The psychological complications were at the top with reference to the frequency. These were observed in 79% of the pts. The most common psychological complication was depressive illness, occurring in 61% of dialyzed pts, which is in line to that on other studies<sup>10,11</sup>.

The cardiovascular complications, like hypertension, arrhythmia have also been observed, hypokalemia being the cause of arrhythmia. It requires termination of dialysis until and unless the management of hypokalemia. Hypokalemia, hypertension and air embolism were observed in 25%, 7% and 5% respectively. It has been suggested that hypotension and associated symptoms may be related to the biochemical changes caused by cellulosic membranes or due to hypovolemia or excessive ultrafiltration of water at the time of dialysis<sup>10</sup>. The ultrafiltration depends upon the condition of the patient, if hypotension and hypovolemia is evident, then no ultrafiltration is advised.

Cardiac arrhythmias are frequently associated with haemodialysis and have been reported to be seen in some series among 76% of the patients<sup>11</sup>. These appeared to occur mostly after the first three hours of dialysis. Various risk factors predisposing dialysis patients to arrhythmias have been identified including rapid electrolyte and fluid shifts, acid base alterations, alteration in parathyroid and calcium metabolism, reduced oxygen saturation levels and changes in erythrocytes potassium levels<sup>12</sup>.

Clinicians have long observed that male patients with haemodialysis have the problem of impotence. A study conducted on 32 male haemodialyzed patients. The views of all these patients were separately interviewed. The reported frequency of impotence was 38%<sup>12</sup>. In another study the prevalence of impotence in men on haemodialysis in excess of 70% was reported. In this study 17.8% of male patients reported the impotence.

Headache, fits, disequilibrium and dementia were the neurological complications observed in 6%, 5%, 4% and 3% respectively. These complications in this study also reflect low frequency in contrast to other international studies<sup>13,14</sup>. This contrast is due to the short duration of maintenance dialysis in this study as compared to international data in which patients were on maintenance haemodialysis for the period of more than 5 years. The shivering, fever and itching were the other common recorded complications of haemodialysis. These were observed in 45, 42% and 22% respectively. These results are comparable with other studies<sup>15,16</sup>.

## CONCLUSION

The results of this study revealed a very high frequency of the complications associated with maintenance haemodialysis.

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