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HEMODIALYSIS COMPLICATIONS IN PATIENTS WITH CHRONIC RENAL FAILURE

Golla Supriya[1]*, Ganji Komali[1], Shaik Ujefa[1], Natta Prathibha[2] and Kantamaneni Padmalatha[3]

[1]Pharm. D V Year, Department of Pharmacy Practice, Vijaya Institute of Pharmaceutical Sciences for Women, Enikepadu, Vijayawada – 521108.

[2]Assistanat Professor, Department of Pharmacy Practice, Vijaya Institute of Pharmaceutical Sciences for Women, Enikepadu, Vijayawada – 521108, Andhra Pradesh, India.

[3]Professor and Principal, Department of Pharmacology, Vijaya Institute of Pharmaceutical Sciences for Women, Enikepadu, Vijayawada – 521108, Andhra Pradesh, India.

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***Corresponding Author**
Dr. Golla Supriya
Pharm. D V Year,
Department of Pharmacy Practice, Vijaya Institute of Pharmaceutical Sciences for Women, Enikepadu, Vijayawada – 521108.

ABSTRACT

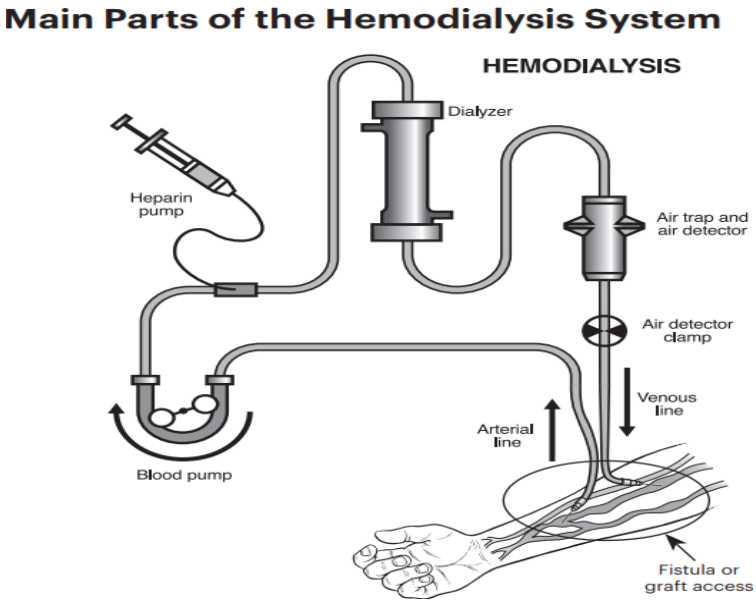
To identify problems in patients receiving hemodialysis for chronic renal failure and to connect them with clinical and sociodemographic parameters. Together with peritoneal dialysis and renal transplantation, hemodialysis (HD) is a common renal replacement therapy in the treatment of end-stage renal disease (ESRD). Hemodialysis can reduce morbidity and mortality in people with kidney disease, but it also comes with a number of risks that might arise from either using it long-term or during the dialysis sessions. It is the most typical technique for eliminating waste and poisonous chemicals from the body, and as a result, it is utilised to treat patients with various forms of renal failure. The development of numerous highly developed and sophisticated dialysis devices has made the therapy more practical and promising nowadays. Nonetheless, patients may still have a variety of difficulties even when receiving dialysis treatment using modern, efficient equipment. Hemodialysis is linked to a number of potentially fatal consequences, however these complications are rare and can be treated and prevented by a variety of preventative therapies provided by the medical team.

KEYWORDS: Complications, Hemodialysis, Sophisticated, Renal Failure.

INTRODUCTION

Healthy kidneys conduct a number of essential tasks. The kidneys are crucial to maintaining homeostasis because they keep the body's environment consistent. Through the kidneys, waste products from several metabolic processes are eliminated. The functioning kidneys also keep the body's water and electrolyte balance. Severe metabolic problems are caused by the progressive and irreversible loss of renal functioning that characterises end stage renal disease (ESRD). Although age-standardized mortality for the majority of other chronic diseases, such as cardiovascular disease (CVD) and cancer, has decreased over the past few decades, CKD is the third fastest growing cause of death globally and is estimated to become the fifth leading cause of death by 2050. 850 million people were estimated to be living with CKD worldwide, which was twice the estimated prevalence of diabetes globally and more than 20 times the estimated global prevalence of HIV or AIDS. The main side effects, according to the literature, include headache, pruritus, and muscle spasm. Abdominal pain, hypotension, hypertension, vomiting, temporary weight gain, and constipation are further problems of lower prevalence.

Procedure



A semi-permeable membrane is used in the hemodialysis procedure as a specific filter that lets the blood pass through. The excess water, waste materials, and toxins are then taken out of the blood by the filter. By preserving the right fluid and electrolyte balance, this treatment also preserves the body's homeostasis and cleans the blood while regulating normal blood pressure. Simple diffusion via a semi-permeable membrane is the principle behind

hemodialysis. Blood and dialysate can flow in opposite directions to a countercurrent flow mechanism, establishing a concentration gradient and improving dialysis efficiency.

DISCUSSION

Study- 01 Habas EL and Rayani A *et al.*, (2019): Analysis of the problems experienced by 335 patients during HD sessions was planned for the study. Every patient received an explanation of the study's objective. No signs of HBV, HCV, or HIV infection were present in any of the individuals. 207 patients reported vomiting (61.8%) at different times of HD session. 137 patients reported Vomiting during the 1st hour (40.9%), 40 patients during the 2nd hour (11.9%), and 30 patient during 3rd hour (8.9%). 88 patients (26.2%) reported experiencing epigastric pain. In 39 patients (11.6%), vomiting was noted together with abdominal pain. Only 6 patients (1.8%) experienced epigastric pain, and vomiting was associated with elevated blood lipase and amylase. 51 patients (15.2%) were hypotensive during the first half hour of HD-time, 42 patients (12.4%) during the second hour, and 28 patients (8.3%) during the final 45 minutes. There were 94 patients (28%) with tachycardia. Only 7 (2%) of the 21 (2.2%) individuals who complained chest pain revealed ECG evidence of ischemia alterations. Only 2 patients passed away during the first hour of CPR, and only 5 patients (1.5%) experienced cardiac arrest. 189 patients reported vomiting, mostly in the first hour of the HD session. One of the frequent consequences at the start of an HD session is vomiting alone. Furthermore, vomiting and nauseousness might have been caused by low calcium concentration and high sodium content in the dialysate. Dialysate sodium was 5 mmol/L higher than patients' serum sodium in the current investigation, although dialysate calcium was the lowest.

Study- 02 Yasir Mehmood, Imran Ali *et al.*, (2019): The case histories of 100 patients (from the morning and evening shifts) who had hemodialysis during a one- to five-year period were recorded using a retrospective method. Patients' demographic and clinical information was compared to that of the control group, which was made up of hemodialysis survivors, for patients who passed away during dialysis. A total of 100 patients (about 1–10 sessions per patient) had 108 hemodialysis sessions. Only three sessions were given to the majority of patients (57%). 53% of patients had subclavian vein dialysis. During hemodialysis, hypotension was the most common consequence (38%) which was caused by fluid loss and mineral imbalances (such Na+, Cl-, and Ca+). It was controlled by either slowing down the flow or pausing the ultra-filtration. The patient was given 5% Dextrose

Solution and normal saline, and the supine position posture was applied. Patients who had few hemodialysis treatments experienced more complications as compared to individuals who had many sessions, and as a result, the latter group was determined to be more stable. It is interesting to note that patients who consumed a lot of water or other liquids during their dialysis process experienced weight gain of up to 3.5 kg and an elevated risk of additional problems.

Study- 03 *Paulo* Eduardo Bastos Barbosa Silva, Magda de Mattos *et al.*,(2019): The study includes 78 medical records of patients who received kidney replacement treatment during hemodialysis in 2016 and experienced complications while receiving hemodialysis. The following criteria were utilized for inclusion: adult patients, 18 years of age or older, with a diagnosis of acute renal injury or chronic kidney disease, who displayed problems during the reported in 94 patients, Arterial hypertension in 47 patients, Cardiac arrhythmias reported in 34 patients, Coagulation of filter or system in 34 patients, lack of vascular access flow in 20 patients, Psychomotor agitation reported in 11 patients, sweating in 07 patients, cramps was reported in 03 patients, Dyspnea reported in 02 patients, hypoglycemia in 01 patient, Bleeding at access was reported in 01 patient, system contamination in 01 patient and no complications were found in rest of the 09 patient. The study concludes that arterial hypotension, arterial hypertension, cardiac arrhythmias, and coagulation of the filter or hemodialysis system stand out as the prominent intradialitone complications.

Study- 04 Elmukhtar Habas, Amnna Rayani *et al.*, (2012): Throughout the study the most prevalent long-term problems in HD patients will be discussed, including cardiovascular disease, renal osteodystrophy, vascular access, malnutrition, and infection spread among HD-dependent patients.

1. **Cardiovascular complications:** The diagnosis of CHD in chronic dialyzed patients involves coronary artery bypass surgery, which has a mortality rate in CKD patients that is more than three times higher than the general population. The most frequent consequence for HD patients is anaemia. It is a significant contributor to CVD risk and rising mortality in HD patients. Cardiovascular dynamics, exercise tolerance, morbidity, and mortality are all improved by anaemia correction using enough tonic supplements, erythropoietin, and adequate HD patients. however, percutaneous transluminal coronary angioplasty, stenting, and bypass surgery are indicated in HD patients. Cardiac disease in HD dependent ESRD is often controlled with standard treatment procedures for cardiac

issues. Compared to the general population, these interventional measures carry a higher risk of mortality, recurrence, and restenosis.

2. **Amyloidosis:** β2M amyloid deposition often starts a few months after HD begins. Clinical signs of amyloidosis deposition at the joints include spondyloarthropathy, deposits under the skin, periarthritis of the shoulders, carpal tunnel syndrome, flexor tenosynovitis of the hands, stiffness, discomfort, and swelling of other joints. After fifteen years of chronic HD, visceral organs experience systemic M amyloid infiltration; yet, this condition is typically asymptomatic.

3. **Osteodystrophy:** Long-term HD raises the chance of osteodystrophy. Osteodystrophy frequently occurs in conjunction with secondary hyperparathyroidism, which is indicated by elevated plasma parathyroid hormone despite normal serum calcium and phosphate levels. The prevalence of osteodystrophy in long-term HD patients is rising along with secondary hyperparathyroidism's associated decreased absorption of calcium loading. Osteodystrophic hip fractures are more common and severe in long-term HD patients than in the matched general population. Patients with CKD can develop dynamic and adynamic bone disorders, but their prevalence increases once HD is started. It is obvious that there is a huge need for more research to determine the best way to diagnose and treat kidney diseases at an early stage in order to prevent late complications of CKD and HD. This is because there are many variables that may affect the morbidity and mortality of HD patients as well as the steady rise in patients with CKD on HD worldwide.

Study- 05 Jessica Dantas de Sa Tinoco, Raissa Lopes Pinheiro *et al.*,(2017): 300 individuals receiving hemodialysis at the hospital that was referred comprised up the population. The sample size formula was employed to determine the sample size for populations with finite sizes. It was possible to gather a sample of 168 patients, which was rounded up to 200 people. The following were the inclusion requirements: Patients in the referred dialysis unit who are 18 years of age or older and receiving dialysis. Patients who were lost in time and place and persons who had trouble verbally communicating made up the exclusion criteria. The most common side effects during hemodialysis that patients experienced were cramps in 149 cases, hypotension in 141 cases, chills in 104 cases, vomiting in 77 cases, headaches in 71 cases, lightheadedness in 70 cases, hypertension in 48 cases, and arrhythmia in 40 cases. Only 2 subjects consistently had complications like nausea,

convulsions, diarrhoea, and stomach pain. 0.5% of problems were associated with fatigue, mental anguish, sweating, weakness, shortness of breath, numbness, body aches, and tremors.

Study- 06 Kousala Gerasimoula, Lagou Lefkothea *et al.*,(2015): 320 patients receiving hemodialysis (183 men and 137 women) made up the sample for the current study. This sample was chosen purely for convenience. All patients receiving HD at dialysis facility were included in the study. The following criteria were taken into account when selecting participants: diagnosis of end-stage renal disease, continuing hemodialysis. 28.1% of the 320 hemodialysis patients were between the ages of 71 and 80 and 57.2% of them were men. The average overall quality of life score was discovered to be 17.43 in a range 0-30. Participants under the age of 60, those with better educational levels, those who were well-informed about the health issue, and those who followed the suggested diet and therapy recommendations had a higher overall quality of life score. The quality of life in hemodialysis patients appears to be influenced by sociodemographic and clinical traits.

CONCLUSION

Problems were extremely common in patients receiving standard dialysis. Long-term dialysis therapy, more frequent dialysis sessions per week, and longer dialysis sessions per week were other factors that were more closely linked to side effects. Common side effects observed during sessions were a drop in blood pressure, an increase in body temperature, cramps, chills, emesis, nausea, allergies, and dialyzer reactions. The results of this study contribute in the establishment and execution of treatment for dialysis patients, leading to conclusions based on the social and clinical factors observed. Understanding these factors assists in early detection of these patients vulnerability as well as health interventions that can overcome difficulties with the hemodialysis technique. In conclusion, during the intradialytic period, nausea, low RBS, heat exhaustion, and hypotension are not common. Early start of HD, suitable dialysate temperature, strict infection control, regular important monitoring on short time basis, and doing HD using carbohydrate dialysate solutions are significant challenges to minimize these rapid onset complications.

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Conflicts of interest

The authors confirm that this article's content has no conflicts of interest.

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