



# COMMON COMPLICATIONS AMONG PATIENTS WITH CHRONIC KIDNEY DISEASE ON MAINTENANCE HEMODIALYSIS:

## A NURSE'S PERSPECTIVE

MRS. LUHEM KAMEI, M.SC CLINICAL NURSE, HEMODIALYSIS UNIT CIHSR DIMAPUR  
NAGALAND INDIA

### Abstract:

Chronic kidney disease (CKD) refers to the state in which the kidney is damaged and is not able to function. It is one of the most common disease conditions at present as the cases are on the rise, the two main risk factors being Diabetes and Hypertension. For patients with End Stage Renal Disease (CKD 4 & 5), there are various types of Renal Replacement Therapy available but Hemodialysis (HD) appears to be the most common treatment modality preferred by patients. Hemodialysis is not a curative treatment for CKD but a therapy that needs to be regularly carried out throughout the patient's lifetime until a renal transplant is done. While Hemodialysis is a necessity to prolong life for many patients suffering from CKD, it also causes various complications. Dialysis complications can be physical, social, and psychological issues. Among the Physical complications, the most common ones include infection, cardiovascular events, ischemic heart disease, stroke, hypotension, fluid overload, pericarditis, respiratory edema, gastrointestinal complications like nausea, vomiting, neuromuscular manifestations, anemia, metabolic bone disease, itching, sleep disturbance, and aching<sup>[1]</sup>. As a Nurse, identification of these complications is very crucial, as providing timely and necessary intervention to the various complications can improve the overall quality of the patient's life.

Keywords: CKD (Chronic kidney disease), RRT(Renal Replacement Therapy), HD(Haemodialysis) , Renal transplant, AVF(Arteriovenous Fistula) , CVC(Central venous catheter), EPO (Erythropoietin).

### Introduction:

“Chronic kidney disease (CKD) is defined as the presence of kidney damage or an estimated glomerular filtration rate less than 60 ml/min/1.73 mt<sup>2</sup>, persisting for 3 months or more, irrespective of the cause”<sup>[2]</sup>. It is one of the most important causes of mortality and morbidity worldwide. The Global Burden of Disease study estimated about 1.4 million deaths globally from CKD in 2019, a 20% increase from 2010, one of the largest rises among the top causes of death<sup>[3]</sup>. For patients diagnosed with CKD, treatment includes Dialysis or Renal transplant. Dialysis is a procedure where excess waste and fluid are removed when the kidney is not able to function. There are different types of dialysis namely Hemodialysis and Peritoneal dialysis. In Hemodialysis, a machine is used to carry out the function of the kidney i.e. removing waste and excess fluid. Hemodialysis procedure has multiple complications ranging from Hypotension, Hypertension, Nausea and Vomiting, Muscle cramps, Headache, anemia etc. Apart from the physical problems, the patients experience social and psychological issues while undergoing Hemodialysis. This article will discuss the common issues faced by the patients that need to be addressed by the nurses for better outcomes.

### Common complications:

#### 1. Physical:

**A. Pain:** Pain can be in any form. It can start from cannulation, central line insertion, fistula creation, Erythropoietin (EPO) injection, intradialytic headache, and pain can also be related to chronic conditions like neuropathy, and many other complications associated with Hemodialysis. Management of the pain, if the cause is identified is key in alleviating the patient's pain. Pharmacological and non-pharmacological interventions can be used in managing the symptoms. Patients are usually anxious before dialysis-related procedures, especially during cannulation. Therefore, it is the responsibility of the health care worker to explain the procedure, however making sure that the information delivered is not a false assurance. A quote from Patient in his early 50s undergoing regular HD in a Secondary hospital in Nagaland, North-East India stated “It has been 2 years since I am undergoing Hemodialysis, I still feel scared just looking at the needles. The needles are quite big. Some cannulation is painless; while some pain just goes through my head.”

#### B. Muscle cramp:

Muscle cramps cause severe discomfort to the patient. The exact etiology of muscle cramps is unknown. Though some of the reasons for muscle cramps are excessive interdialytic weight gain, aggressive fluid removal, and intradialytic hypotension

(low blood pressure during Hemodialysis). Therapies that are commonly prescribed include quinine, Vitamin E, Prazosin, carnitine, stretching, exercise, and increasing the frequency of dialysis.<sup>[4]</sup>

### C. Infection:

Hemodialysis catheters are a vital part of Renal replacement therapy. While these catheters are considered only the bridge to long-term vascular access such as Arteriovenous fistulas and grafts, they are associated with significant morbidity and mortality and subsequently increase the health care expenditures for the patients<sup>[5]</sup>.

Patients on dialysis are prone to getting infection given the immunocompromised state. Catheter-associated bloodstream infection is the most common one. A study that included 6,005 HD centers in the USA reported that the Access-related bloodstream infection (ARBSI) rate was 0.64 per 100 patient months. The risk of Access-related bloodstream infection (ARBSI) was eight-fold higher with Central venous catheter (CVC) use than with Arterio Venous Fistula (AVF), and increased with prolonged catheter use.<sup>[5]</sup> Symptoms of infections include chills and rigor during Hemodialysis and headache. Infection is confirmed by doing a blood culture and sensitivity test. Once confirmed, antibiotics can be given as per the physician's advice. If Infection is recurrent it is advisable to change the catheter to prevent further complications. Infection can somehow be controlled by maintaining strict hand hygiene and adhering to infection prevention and control standard practices.

### D. Pruritus:

Pruritus means itching and is one of the most common complications of Hemodialysis. Pruritus can interfere patient's sleep, compromise quality of life, and can also hamper activities of daily living. It is a common observation even among our patients that scars were present on the body due to excessive scratching. A cross-sectional study was done from January to March of 2021 in Hemodialysis centers of four different hospitals in the West Bank, Palestine with 250 HD patients. Pruritus was observed in 121 (48.4%). The 5-D itching score had a median [IQR] of 5.0[5.0-15.0], and 57.2% had a score  $\geq 6$  points. Severe pruritus was reported in 28.1% of patients. The score was significantly associated with residency ( $p = 0.033$ ) and chronic comorbidities ( $p = 0.026$ ). The Pittsburgh sleep quality index (PSQI) score has a median [IQR] of 8[5-12], and 66.4% are poor sleepers with a score of  $< 5$ . The score was significantly associated with age ( $p = 0.017$ ), marital status ( $p = 0.022$ ), occupational status ( $p = 0.007$ ), chronic comorbidities ( $p > 0.001$ ), chronic medication ( $p = 0.008$ ), severity of pruritus ( $p = 0.003$ ) and duration of pruritus ( $p = 0.003$ ).<sup>[6]</sup>

### E. Anemia:

Anemia is a well-known complication seen among CKD patients. The development of anemia in patients with CKD is driven by at least two factors. First, those with CKD produce less Erythropoietin, a hormone produced by the kidneys that stimulate red blood cell production, secondly, Hcpidin—a hormone that (at high levels) impairs dietary iron absorption—is elevated in patients with CKD. Iron is an essential component of Haemoglobin and is therefore necessary for oxygen transport. It is well established that the presence of anemia in patients with CKD is associated with poorer quality of life and increased risks of adverse clinical outcomes<sup>[7]</sup>. Patients are most commonly managed with oral or intravenous iron supplements and with erythropoiesis-stimulating agents (ESA) commonly available as Erythropoietin injections. However, these treatments have associated risks, and sometimes are insufficiently effective<sup>[8]</sup>. Blood transfusion is usually indicated by the physician if Hemoglobin levels drop below 6 gm/dl.

### F. Hypotension:

Hypotension or low Blood pressure is the most common complication seen among patients during dialysis. The National Kidney Foundation-Kidney Disease Outcomes Quality Initiative defines hypotension as a decrease in systolic blood pressure (SBP)  $>20$  mm Hg or a decrease in mean arterial pressure by 10 mm Hg.<sup>[9]</sup> Hypotension during dialysis occurs because a large volume of blood water and solutes are removed over a short period of time, overwhelming normal compensatory mechanisms, including plasma refilling and reduction of venous capacity, due to reduction of pressure transmission to veins<sup>[10]</sup>. The most common signs and symptoms of hypotension during Hemodialysis are giddiness, nausea, vomiting, generalized weakness, and sweating. Abdominal discomfort is one uncommon symptom seen among a few of our symptoms. Treatment includes infusing intravenous normal saline preferably around 150 ml or as required depending on the stability of the blood pressure (making sure that we don't give too much fluid), and reducing the ultrafiltration.

### G. Hypertension:

Hypertension is also one common complication during Hemodialysis and is often poorly controlled. The strict control of hypertension in patients with CKD is critical in reducing further kidney damage and heart-related complications. Nevertheless, hypertension control is difficult in CKD patients and often requires multiple drug combinations.<sup>[11]</sup>

### H. Other physical problems:

Physical problems among patients are subjective and the cause can be multifactorial. Some do not have any discomfort while some have multiple issues ranging from Inability to Self-care, breathlessness, poor appetite, weakness, insomnia, edema, vascular access-related complications, cognitive impairment, and so on.

- Inability to Self-care: Self-care is important in hemodialysis patients to improve health and obtain optimal quality of life. Self-care behaviours such as medical care i.e. taking the prescribed medication, consultant visits; nutrition, and exercises are what define healthy living in our context. Some can very much do all the daily chores, while some are confined to beds. For mobile patients, engaging in some form of occupation may greatly benefit the patients. Emphasis on occupational therapy can be laid for those types of patients, as it will help in financial aid as well. One HD patient aged 56, stated, "I cannot do anything even at home since I cannot see, I have to ask help from my family even to go for my needs". Unable to self-care creates a feeling of guilt in patients. In circumstances like this counselling the patients and the caretaker will benefit.

### 2. Psychological

- A. Stress: The patients undergoing the treatment experience a huge amount of stress, the most common stressors being financial stress, stress on complications during hemodialysis, frequent visits to the hospital, failed Arterio Venous fistula, creating AVF, unavailability of personal vehicle to commute, future uncertainty, perceive and/or real lack of family support, perceived effects of illness, functional limitations, restrictions on diet and fluid, with multiple medications being prescribed. Fluid restriction is one of the major challenges faced by patients, especially during the hot humid season. Though nothing can be

done about this, since the body does not allow taking more fluids, reinforcement of fluid restriction can be encouraged. A patient said, "Since I am restricted to drinking water, water has become tastier". Financial problems also lead to stress in many patients and their families. Dialysis is a procedure not affordable by all, and regular visits for the procedure i.e. twice or thrice a week becomes impossible for the patients financially. Attrition rates are seen among patients because of unaffordability. However, because of government schemes like Pradhan Mantri Jan Arogya Yojana available these days, patients are able to continue the treatment.

"Thanks to the Ayushman Bharat scheme, we can continue doing dialysis, if not we would have died a long time ago," says a patient.

- B. Caregiver burden:** Since patients come to the hospital twice or thrice a week, it is not just the patient's freedom that is restricted but also the family member's. Their daily routine solely depends on the patient's health. They have to keep a tab on the patient's diet and also their fluid intake, as dialysis patients' fluid intake is very limited.

Additionally, the family members will also have to learn to live with varied multiple problems experienced by the patients in their day-to-day lives.

A cross-sectional analytical study was conducted in a tertiary care hospital in Northern India. A total of 110 caregivers who were providing care to their patients for more than 3 months were selected. The study shows that nearly half of the caregivers, 50(45.46%) reported mild to moderately burdened, while 15(13.63%) had moderate to severely burdened. <sup>[11]</sup>

- C. Depression:** Depression is one of the very common mental disorders worldwide. Depression among patients undergoing Hemodialysis is attributed to various factors. E.g. job loss, change of roles in the family, sexual dysfunction, unsure of conceiving, invasive procedures of dialysis, the cost of the procedure, issues related to vascular access, and so on. <sup>[12]</sup>. It took a decade for the nephrology community to appreciate depression as an important problem in patients with kidney failure treated by maintenance Dialysis. <sup>[13]</sup>

A cross-sectional study was conducted on "Depression and Anxiety in patients of chronic kidney disease undergoing Hemodialysis" at the Nephrology department of a tertiary care institution on 100 CKD patients undergoing Hemodialysis; the prevalence of depressive disorder and anxiety disorder among CKD patients was around 66% and 61%, respectively. Depression and anxiety were significantly associated with gender, occupation, income, and duration of Hemodialysis in these patients <sup>[11]</sup>. Depression was found to be common among patients but of the patients who come to our institution many of them were not identified with depression. It may be the fact that they have a good support system to meet their physical and financial needs. Diagnosing and treating depression is crucial among Hemodialysis patients since untreated depression is associated with poor adherence to management, increased morbidity and mortality rates, and low quality of life among patients undergoing Hemodialysis. <sup>[14]</sup>

- D. Anxiety:** CKD Patients undergo Hemodialysis 2- 3 times a week, for 3-4 hours. This will continue throughout their lifetime until a Renal transplant is done. The patients in our region rarely avail of such procedures due to unaffordability, lack of donors, and lack of specialists. People with chronic kidney disease often experience anxiety because of threats to their integrity where they often think that the disease will cause physiological disability and even death. <sup>[15]</sup>

Anxiety is often seen in people in the initial stages of the treatment where one does not know the outcome of the disease. New patients may be hesitant to ask questions when in the initial phase of the diagnosis, therefore establishing trust between the patients and the healthcare professionals will facilitate better-coping mechanisms.

"How long will I survive with this procedure; Will my kidney get better after dialysis?" are some of the anxious questions that patients usually ask.

- E. Self-esteem:** Self-esteem is usually low in Hemodialysis because they depend on family members for their basic needs. Having the fistula makes them feel concerned and they do not feel comfortable socializing with other people. A patient in her early 30s verbalizes that "I look darker than I used to be, that's the reason I don't mingle with friends as I feel embarrassed ". In addition to that, self-esteem comes down with the change in body image and inadequate feeling of not supporting the family financially.

- F. Social life:** Social life among CKD patients are minimal or even nil which leads to social isolation and may concurrently lead to clinical depression. They prefer isolating themselves rather than being in the company of others. A patient in his 30s when asked what are your plans for Christmas, replied "I have not celebrated Christmas with my family and friends for I don't know how many years. I don't like to plan anything. I just stay at home."

- G. Future expectations:** "How long will I live?". "How long have the other patients survived undergoing Hemodialysis? Will I conceive? My menstruation is not normal. What shall I do? are some of the most frequently asked questions. And as a healthcare worker, there seems to be no answer to these questions. A young adult in her early 30s was diagnosed with Chronic Kidney disease (CKD) right after her marriage, a concerned lady doing dialysis right across her, asked "will she have babies? unfortunate". Another male patient quoted "I don't think for the future as there is no future. I am glad I am still surviving".

- H. Spirituality:** Most patients accept the chronic disease saying it's all God's plan. For many people in Nagaland, spirituality, and religion are important dimensions of their existence and are a source of support that contributes to their well-being. "Spirituality is a complex theory, and its presence in individual is unwavering, therefore is a means of dealing with difficulties. Spirituality brings inner peace to individual. Religiosity and spiritual engagement motivate the individual to implement healthy practices and habits, avoid dangerous behaviours, create strong support system and also have a positive outlook towards life. <sup>[16]</sup>. A bed bound patient quoted "I really want to go to church for my service, but I cannot go since I am unable to sit". Counselling with the chaplain is what we do in our setting sometimes.

### Conclusion:

Change is inevitable but coping to overcome that change is what matters at the end of the day. Nurses play a pivotal role in the overall treatment of the patient's well-being. We tend to focus on physical well-being rather than the psycho-social issue, at the end of the day one feels that the improvement in physical health is more valued. Countless physical, as well as psychological issues, are associated with Hemodialysis therapy. For some, it can be in the initial phase of the therapy, while for others it can last throughout the process of the treatment. It is very important to identify these issues and address them. Assessment and identification of the patient's needs will help the nurses and also other health care professionals in decision-



making and planning for care, so as to have good outcomes. Continuous education on diet, fluid intake, regular blood workups, visits to the physician, counselling and screening for depression, anxiety, occupational therapy, can be some of the interventions considered. As Patients spend most of their time in the hospital, they become more habituated to that environment and think that the hospital is their second home. As a Renal Nurse, it is our role and responsibility to educate those in need, as the people they look up to the most are the healthcare workers. Also, priority should be given to not only the physical health but also the psycho-social aspect, as it will greatly benefit in the overall treatment of the patients.

**Conflict of interest:**

No conflict of interest.

**References:**

1. Habas E, Habas A, Elgamal M, Shraim B, Moursi M, Ibrahim A, Danjuma M, Elzouki AN. Common complications of hemodialysis: A clinical review. *Ibnosina Journal of Medicine and Biomedical Sciences*. 2021 Dec;13(04):161-72.
2. Vaidya SR, Aeddula NR, Doerr C. Chronic renal failure (nursing).
3. Shrestha N, Gautam S, Mishra SR, Virani SS, Dhungana RR. Burden of chronic kidney disease in the general population and high-risk groups in South Asia: A systematic review and meta-analysis. *PLoS One*. 2021 Oct 14;16(10):e0258494.
4. Bello AK, Okpechi IG, Osman MA, Cho Y, Htay H, Jha V, Wainstein M, Johnson DW. Epidemiology of haemodialysis outcomes. *Nature Reviews Nephrology*. 2022 Jun;18(6):378-95.
5. El Khudari H, Ozen M, Kowalczyk B, Bassuner J, Almekhmi A. Hemodialysis catheters: update on types, outcomes, designs and complications. In *Seminars in Interventional Radiology 2022* Feb 18 (Vol. 39, No. 01, pp. 090-102). 333 Seventh Avenue, 18th Floor, New York, NY 10001, USA: Thieme Medical Publishers, Inc..
6. Daraghme M, Badran M, Janajreh A, Hassan M, Taha AA, Koni AA, Zyoud SE. Prevalence of pruritus associated with hemodialysis and its association with sleep quality among hemodialysis patients: a multicenter study. *BMC nephrology*. 2022 Dec;23(1):1-8.
7. Palaka E, Grandy S, van Haalen H, McEwan P, Darlington O. The impact of CKD anaemia on patients: incidence, risk factors, and clinical outcomes—a systematic literature review. *International journal of nephrology*. 2020 Jul 1;2020.
8. Portolés J, Martín L, Broseta JJ, Cases A. Anemia in chronic kidney disease: from pathophysiology and current treatments, to future agents. *Frontiers in Medicine*. 2021 Mar 26;8:642296.
9. KD W. K/DOQI clinical practice guidelines for cardiovascular disease in dialysis patients. *Am J Kidney Dis*. 2005;45:S1-53.
10. Daugirdas JT. Pathophysiology of dialysis hypotension: an update. *American journal of kidney diseases*. 2001 Oct 1;38(4):S11-7.
11. Sharma M, Lakhara P, Kumar Sharma S, Jelly P, Sharma R. The burden of caregivers of patients undergoing hemodialysis. *Journal of Holistic Nursing And Midwifery*. 2021 Mar 10;31(2):69-75.
12. Kimmel PL, Cukor D. Anxiety symptoms in patients treated with hemodialysis: measurement and meaning. *American Journal of Kidney Diseases*. 2019 Aug 1;74(2):145-7.
13. Gadia P, Awasthi A, Jain S, Koolwal GD. Depression and anxiety in patients of chronic kidney disease undergoing haemodialysis: A study from western Rajasthan. *Journal of Family Medicine and Primary Care*. 2020 Aug;9(8):4282.
14. Sulistni R, Damanik HD. Anxiety Stress and Fatigue in Hemodialysis Patient. In *First International Conference on Health, Social Sciences and Technology (ICOHSST 2020)* 2021 Apr 19 (pp. 88-91). Atlantis Press.
15. Sharif Nia H, Kohestani D, Froelicher ES, Ibrahim FM, Ibrahim MM, Bayat Shahparast F, Goudarzian AH. The relationship between self-care behavior and concerns about body image in patients undergoing hemodialysis in Iran. *Frontiers in Public Health*. 2022 Mar 4;10:825415.
16. Fradelos EC, Alikari V, Tsaras K, Papathanasiou IV, Tzavella F, Papagiannis D, Zyga S. The effect of spirituality in quality of life of hemodialysis patients. *Journal of Religion and Health*. 2021 Jan 7:1-2.

