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Case report on a patient with chronic kidney disease with nausea

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Abstract
Chronic kidney disease (CKD) is a global health problem whose prevalence continues to increase annually. One common symptom in CKD patients, particularly those undergoing regular hemodialysis, is nausea. This symptom can significantly reduce a patient's quality of life and impact nutritional status and fluid balance. Therefore, appropriate management of nausea is a crucial part of nursing practice. The purpose of this case report is to evaluate the effectiveness of nursing care for CKD patients with the main complaint of nausea after undergoing hemodialysis. This study used a descriptive case study design on a 56-year-old male patient who presented with severe nausea after hemodialysis. Data were collected through interviews, observations, and physical and laboratory examinations. Nursing interventions provided included pharmacological and non-pharmacological approaches. After a three-day intervention involving semi-Fowler's positioning, dietary education, and collaborative antiemetic administration, a comprehensive, evidence-based nursing approach has been shown to be effective in reducing nausea in CKD patients. The nurse's active role in patient assessment, intervention, and education is crucial to improving patient comfort and quality of life.

Keywords: CKD; hemodialysis; holistic intervention nausea; nursing

1. Introduction
Chronic Kidney Disease (CKD) is a global health problem whose prevalence continues to increase every year. According to WHO data from 2022, the prevalence of chronic kidney failure in Indonesia increased by 41.4% between 1995 and 2025, ranking fourth in the world with the highest prevalence. The prevalence of chronic kidney disease (CKD) is 0.5% which mostly involves young adults aged 18-59 years (83.1%) with the majority of subjects being women (60.3%), unemployed (58.4%) and the proportion of obese subjects was 25.4% (Hustrini et al., 2022). Chronic kidney failure globally affects >10% of the general population worldwide, with the number of sufferers being around 843.6 million people (Kovesdy, 2022).

Chronic Kidney Disease is a failure of kidney function to maintain metabolism and fluid and electrolyte balance due to progressive destruction of the kidney structure with manifestations of accumulation of metabolite waste (uremic toxins) in the blood (Muttaqin, A., & Sari, 2020). Chronic kidney failure can progress to end-stage renal disease, where the kidneys stop working and can be life-threatening. Nearly all patients with chronic kidney disease require hemodialysis. Even if they receive regular hemodialysis, hemodialysis cannot completely replace kidney function. Hemodialysis as a kidney replacement therapy is vital in prolonging life, but it has limitations: dialysis cannot completely replace the hormonal, metabolic, and excretory functions of the kidneys. (Syahputra et al., 2022). According to PENEFRI (Indonesian Nephrology Association) in 2018, the number of new patients undergoing hemodialysis in Indonesia reached 66,433 and continues to increase annually. Hemodialysis is a high-tech therapy that replaces kidney function to remove metabolic waste or certain toxins from the human bloodstream, such as water, sodium, potassium, hydrogen, urea, creatinine, uric acid, and other substances through a semi-permeable membrane that separates blood and dialysate fluid in an artificial kidney, where diffusion, osmosis, and ultrafiltration processes occur (Rizky Sulymbona et al., 2020). Patients' dependence on hemodialysis therapy throughout their lives has a significant impact on various aspects of their lives. The hemodialysis process, which must be undergone routinely and periodically, requires patients to adjust their daily schedules, social activities, and work. In addition, this dependence also affects the patient's psychological condition, such as the emergence of feelings of anxiety, stress, and depression due to physical limitations and drastic lifestyle changes. Support from family and healthcare professionals is crucial in helping patients adapt to this condition and maintain their quality of life (Manalu, 2020). This fact demonstrates that CKD cannot be viewed solely as an individual disease, but rather as a health issue that requires attention from all elements of the healthcare system, including nursing staff (Alfikrie et al., 2022).

Gastrointestinal system disorders in patients with chronic kidney failure undergoing hemodialysis, as seen from complaints of nausea, vomiting, and loss of appetite found in patients with chronic kidney failure, are suspected to be due to gastroparesis or delayed gastric emptying (Jannah et al., 2024). One of the most common clinical manifestations experienced by CKD patients, especially those undergoing regular hemodialysis, is nausea. Nausea in CKD patients can be caused by various factors such as increased uremia levels, electrolyte imbalances, side effects of dialysis therapy, and the accumulation of uremic toxins in the digestive system. Physiologically, the accumulation of uremic toxins especially urea, creatinine, guanidino compounds activates the vomiting center in the high tolerance medulla (Medullary Chemoreceptor Trigger Zone), which is further exacerbated by electrolyte imbalance (hyperkalemia, hyponatremia, and pH changes) and metabolic acidosis (Metzger et al., 2021).

Based on gender, men have a higher risk of experiencing chronic kidney failure (CKD) compared to women. One of the main factors influencing this difference in risk is the more dominant role of the hormone estrogen in women. Estrogen has a protective effect on the kidneys through several complex biological mechanisms. This hormone can affect calcium levels in the body by inhibiting the formation of certain cytokines that play a role in bone resorption by osteoclasts. Estrogen helps prevent osteoclasts from absorbing excess calcium from bone, thus maintaining mineral balance and bone health, which also positively impacts kidney function. Furthermore, estrogen plays a role in modulating inflammatory and oxidative responses in kidney tissue, which tend to be higher in men, increasing the risk of kidney damage. Women, with higher estrogen levels, have a natural protective ability against the inflammatory process and kidney fibrosis, which are the main causes of CKD progression (Rafi Fathurrohman & Suparti, 2020).

Nausea symptoms that are not treated properly can have quite extensive and serious impacts on the patient's condition, especially those undergoing hemodialysis therapy or having chronic kidney disease. One of the main consequences of prolonged nausea is decreased nutritional intake, where patients tend to avoid foods, especially those containing high protein or other essential nutrients. This condition causes protein-calorie malnutrition which has a negative impact on overall body function. Malnutrition not only accelerates the decline of the patient's immune system, thereby increasing susceptibility to infection, but can also worsen complications that arise after dialysis. In addition, fluid and electrolyte imbalances due to dehydration caused by nausea also worsen the patient's clinical condition. All of these factors together contribute to a significant decline in the patient's quality of life, making effective nausea management crucial for maintaining health stability and prolonging life expectancy. (Jannah et al., 2024) ; (Alfikrie et al., 2022).

Psychosocially, chronic nausea in patients with chronic kidney disease has a serious impact on their mental condition and behavior. This constant feeling of discomfort can significantly increase levels of anxiety and depression. This worsening psychological condition often reduces the patient's motivation to undergo the necessary treatment, including arriving on time for dialysis sessions, which is an important part of the therapy. Furthermore, patients tend to be less compliant with dietary recommendations provided by healthcare professionals, such as limiting salt and protein intake. This non-compliance not only worsens physical conditions but also triggers a negative cycle that accelerates the progression of kidney disease (Alfikrie et al., 2022). Therefore, early and comprehensive treatment of nausea is not only an aspect of symptom management but also a crucial strategy for maintaining nutritional status and mitigating the risk of fatal complications.

In nursing practice, it is important for nurses to not only understand the physiological causes of nausea but also be able to provide comprehensive nursing care that includes a thorough assessment, evidence-based interventions, and continuous evaluation. This is in line with the view (Lestari et al., 2025) that nurses have a crucial role in early detection of symptoms that could potentially worsen a patient's condition, including nausea in CKD patients, and in implementing holistic preventive and curative measures. Therefore, this report was prepared to describe in more depth the nursing care process for CKD patients experiencing nausea and provide appropriate treatment recommendations based on theory, clinical practice, and the latest scientific literature.

2. Method

This case report uses a descriptive approach with a case study design on a patient with Chronic Kidney Disease (CKD) who experienced post-hemodialysis nausea as the primary complaint. Patients

were selected based on the following inclusion criteria: diagnosed with CKD, undergoing regular hemodialysis therapy, and experiencing nausea. and require nursing care. The exclusion criteria are patients who experience severe or severe impaired consciousness. in condition

2.1. Data collection technique

Data collection techniques were carried out through interviews, direct observation, documentation studies, and comprehensive nursing assessments. Interviews are conducted in a structured manner with patients and/or families to gather subjective information regarding the complaints they experience. Observation is used to assess the patient's physical condition and response to therapy. Documentation studies include reviewing medical records, laboratory results, and notes on previously performed nursing actions. Nursing assessment is carried out systematically using the SOAP (Subjective, Objective, Assessment, Planning) format approach to obtain a comprehensive picture of the patient's condition.

3. Results and Discussion

3.1. Results

The patient in this case report is a 56-year-old man with the initials Mr. S, with a history of stage V chronic kidney disease for 6 years. The patient was diagnosed with CKD six years ago and has been undergoing hemodialysis regularly twice a week since then. The patient came to the Emergency Department (ER) with a chief complaint of severe nausea that occurred after the last hemodialysis session. This complaint was accompanied by vomiting, decreased appetite, and discomfort in the epigastric region.

The supporting examinations performed on the patient included a complete blood count and radiology. The complete blood count revealed an erythrocyte count of 2.6 /µL (normal value 4-5.4). 10 3 /µL), hemoglobin 8.2g / dL (normal value 12-15g / dL), hematocrit 24.6% (normal value 35-49%), leukocytes 7.76 / µL (normal value 4.5-11.5 / µL), platelets 239 / µL (normal value 150-450 / µL), creatinine 7.61mg / dL (normal value 0.51-0.95mg / dL). Radiological results with the type of adult thorax examination AP / PA obtained an interpretation of no visible thickening of the pleural space cor: CTR less than 0.56.

In this case report, the patient complained of persistent nausea, especially after undergoing hemodialysis, the patient stated that his appetite had decreased drastically in the last three days, the patient said he often felt weak and dizzy because he could not eat well. The patient's objective data showed blood pressure of 130/80 mmHg, pulse 88x/minute, temperature 36.7 °C and respiration 20x.minute. The patient's weight decreased by 1.5 kg compared to the previous week, the results of an abdominal examination showed mild tenderness in the epigastric area, then laboratory results showed an increase in blood urea and creatinine levels.

The nursing diagnosis that emerged in this case was nausea related to the accumulation of metabolic products (urea) due to impaired kidney function. This diagnosis was raised because the assessment results stated that the patient complained of nausea, felt like vomiting, had no interest in eating, and appeared weak. The nursing diagnosis of nausea has objectives in accordance with the Indonesian Nursing Outcome Standards (SLKI), namely the level of nausea (L.08065) with signs of decreased dehydration, able to recognize and avoid triggers of nausea, complaints of nausea decreased, the feeling of wanting to vomit decreased, pale with the criteria for improved outcomes.

In this case, the author uses nursing interventions in accordance with the Indonesian Nursing Intervention Standards (SIKI), namely Nausea Management (I.03117) with an action plan to be carried out, namely monitoring nausea (frequency, duration, and level of pumping), providing a semi-Fowler position to the patient. Then for education, provide health education to the patient regarding appropriate eating patterns and foods that can reduce nausea. The action plan carried out also collaborates with the medical team in administering antiemetics. After making a nursing action plan, then carry out nursing implementation in accordance with the nursing diagnosis in the case by monitoring nausea, frequency, duration and severity, providing a semi-Fowler position to increase comfort and reduce pressure on the stomach, provide health education regarding appropriate eating patterns and foods that can reduce nausea, then collaborate in administering antiemetics, namely ondansetron 8mg injection. After 1 hour of nursing actions with nausea problems, the patient's evaluation results showed that nausea complaints

were significantly reduced. The patient showed a good understanding of the importance of regular rest patterns, appropriate eating patterns and foods that can reduce nausea.

3.2. Discussion

Chronic Kidney Disease (CKD) is a progressive condition that causes gradual and continuous kidney damage. Risk factors for CKD include metabolic disorders such as diabetes, hypertension, mechanical disorders such as kidney stones and urinary tract obstruction, and other conditions. Diabetes mellitus is a major risk factor for chronic kidney failure. High blood glucose levels in people with diabetes cause damage to the small blood vessels in the kidneys, a condition known as diabetic nephropathy. This damage impairs the kidneys' ability to efficiently filter waste and fluid from the blood. The main clinical signs of diabetic nephropathy are proteinuria, indicating damage to the kidneys' filtering function, and glucosuria, indicating the kidneys' inability to properly reabsorb glucose. If not managed properly, this condition can progress to chronic kidney failure. Patients with diabetes have a significantly higher risk of developing CKD than individuals without diabetes. In addition to diabetes, hypertension is also a significant risk factor in the development of CKD. Patients with hypertension are 13 times more likely to develop chronic kidney failure than those without hypertension. One mechanism involved is overactivation of the Renin-Angiotensin-Aldosterone System (RAAS), which causes vasoconstriction and salt and fluid retention. This increases blood pressure and leads to progressive kidney damage. Increased sympathetic activity also contributes to systemic vasoconstriction and worsens kidney damage. Another factor contributing to the risk of CKD is a history of kidney stones, with ureteral stones and renal pelvis stones causing urinary tract obstruction that impedes urine flow and impairs kidney function. Furthermore, an enlarged prostate and advanced cervical cancer can cause hydronephrosis through ureteral obstruction. If these obstructive conditions are left untreated, the risk of chronic kidney failure increases significantly (Suara & Retnaningsih, 2024).

In advanced stages, CKD patients require renal replacement therapy, such as hemodialysis, to sustain life. Although hemodialysis can partially replace kidney function, this procedure is not without complications, one of which is nausea, which patients often experience after undergoing dialysis (Triyono et al., 2023). This symptom can appear during the dialysis process, immediately after dialysis is completed, or even continue several hours later. In this case, Mr. S exhibited severe post-hemodialysis nausea that affected his nutritional status and overall quality of life. Nausea in CKD patients is caused by various factors, including the accumulation of urea and other toxins in the blood, electrolyte imbalances, decreased gastrointestinal motility, and stimulation of the nausea center in the medulla oblongata due to uremia (Henson et al., 2020). Nausea and vomiting tend to occur in patients aged <60 years, making it easier for older patients to control nausea and vomiting than younger patients. One underlying reason for this is the adaptation of the nervous system and metabolic processes that change with age, so elderly patients may have a higher tolerance for stimuli that trigger nausea. Furthermore, life experiences and developed coping mechanisms in elderly patients may also help them cope with and manage nausea and vomiting more effectively. Conversely, younger patients may have a higher sensitivity to these stimuli, as well as stronger emotional and psychological reactions that exacerbate symptoms (Hijazi et al., 2018). Therefore, the approach to managing nausea and vomiting symptoms needs to be tailored to the patient's age to be more effective and tailored to individual needs.

Nausea symptoms that are not treated effectively can cause decreased food intake, dehydration, electrolyte disturbances, and even worsen the patient's clinical status. Therefore, the role of nurses in managing these symptoms is crucial. Based on the assessment data, the nursing interventions implemented in this case included a holistic approach that focused not only on pharmacological treatment but also on non-pharmacological approaches, such as the semi-Fowler position, which has been shown to be effective in reducing nausea (Sari et al., 2022). The semi-Fowler position is highly effective in reducing the risk of aspiration in patients, especially those experiencing digestive disorders or nausea and vomiting. This position is done by lifting the patient's head and chest at an angle of about 30–45 degrees, so that the respiratory tract is better protected from the possibility of stomach contents entering the lungs. Furthermore, the semi-Fowler's position helps relax tense abdominal muscles, thereby reducing tension and discomfort in the abdominal area. This more relaxed abdominal muscle tone facilitates optimal digestion, aids food movement through the digestive tract, and reduces the frequency and intensity of nausea experienced by patients. This position is especially recommended for

patients at high risk of aspiration, such as those undergoing certain medications or those with impaired consciousness (Hnynn Si et al., 2023).

In addition to proper body positioning, dietary modifications are also crucial for reducing nausea and improving patient comfort during recovery. A low-protein, low-salt diet is highly recommended as it can ease the burden on the kidneys and reduce fluid retention. Furthermore, small, frequent meals help maintain metabolic stability and prevent the stomach from overworking itself, which can trigger nausea. Patient education should also be emphasized, particularly regarding avoiding foods with strong or pungent odors, such as spicy, fishy, or pungent foods, which can trigger nausea. Furthermore, maintaining oral hygiene is crucial to minimize discomfort and unpleasant tastes that can trigger nausea. Patients are advised to regularly clean their mouths and maintain healthy teeth and tongues to keep their mouths fresh and clean. With a combination of proper positioning, diet, and education, it is hoped that nausea symptoms can be minimized and the healing process can proceed more smoothly (Hnynn Si et al., 2023).

The use of antiemetics, especially ondansetron, is often the first choice in treating nausea and vomiting in patients because of its high effectiveness. Ondansetron works by blocking serotonin type 3 (5-HT3) receptors, which act as key mediators in the neural pathways that trigger nausea and vomiting, thus providing a rapid and significant effect in reducing these symptoms. In clinical practice, ondansetron administration is often carried out in multidisciplinary collaboration between doctors, nurses, and other health workers to ensure optimal treatment and according to patient needs. However, despite its effectiveness, the use of antiemetics such as ondansetron should be done with caution and close monitoring, especially in patients with decreased kidney function. Decreased kidney function can affect drug metabolism and excretion, potentially leading to drug accumulation in the body and increasing the risk of side effects. Therefore, monitoring the patient's vital signs and kidney function during therapy is very important to adjust the drug dosage and prevent unwanted complications. This monitoring includes regular blood pressure and heart rate checks, as well as laboratory tests for kidney function. With a careful and coordinated approach, ondansetron use can provide maximum benefit in managing nausea while minimizing risks for patients with kidney disorders. (Georgianos & Agarwal, 2023).

In the nursing context, it is important for nurses to conduct regular assessments of nausea intensity using a numeric rating scale (NRS) so that the effectiveness of interventions can be evaluated appropriately. In addition, educating patients about diet, appropriate meal times, and avoiding foods that stimulate the stomach is an important part of health promotion in CKD patients. Adequate food intake in hemodialysis patients is important in supporting the nutritional status and quality of life of chronic kidney failure patients undergoing hemodialysis. Adequate and recommended nutritional intake can improve balance and food intake into the stomach. Patient diet is a factor that influences the severity of nausea and vomiting in patients undergoing hemodialysis (Jannah et al., 2024). Patients also demonstrate an understanding of self-management of symptoms. This shows that an appropriate, collaborative, and evidence-based nursing approach can have a significant positive impact on the clinical condition of CKD patients.

Overall, this discussion shows that managing nausea symptoms in CKD patients requires a thorough understanding of the etiology, an appropriate intervention approach, and ongoing monitoring. This is in line with the basic principles of nursing care which are holistic, individual, and patient-centered.

4. Conclusion

Patients with chronic kidney disease (CKD) often experience nausea as a complication of hemodialysis or due to the accumulation of uremic toxins in the body. Untreated nausea can negatively impact nutritional status, fluid and electrolyte balance, and quality of life. Through an appropriate nursing care approach, including a thorough assessment, provision of pharmacological and non-pharmacological interventions, and patient education, nausea symptoms can be significantly minimized. In Mr. S's case, the application of a semi-Fowler's position and administration of antiemetics. In conclusion, managing nausea in CKD patients requires a multidisciplinary and holistic approach. Nurses play a crucial role in identifying symptoms early, providing appropriate interventions, and supporting patients as they adapt to their chronic condition. This approach is expected to increase comfort, improve nutritional status, and support patients' overall quality of life.

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