

Case report of nephrolithiasis (kidney stone) patients with acute pain problems

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Abstract

Abstract Kidney Stones or often called Nephrolithiasis is a common public health problem and the prevalence continues to increase worldwide with a prevalence of kidney stones of 6 per 100 population / 1,499,400 Indonesians suffer from kidney stones with an age range of 30-60 years. Kidney stones (Nephrolithiasis) is the formation of hard stones in the kidneys derived from minerals and salts, calcium and oxalic acid. This comes from waste in the blood that crystallizes and accumulates over time, this can occur in the kidneys, ureters, bladder, and urethra. Because of the formation of kidney stones, the flow of urine blocked which causes increased pressure in the kidneys, causing pain and discomfort. The results of the assessment in the emergency unit of PKU Muhammadiyah Bantul Hospital on Mrs. D aged 71 years with a diagnosis of kidney stones (nephrolithiasis) accompanied by complaints of acute pain in the right waist accompanied and pain when urinating without blood. Additionally, the patient vomited when transported to the hospital. Regarding those conditions, the author carried out nursing interventions focused on using pharmacological and non-pharmacological therapy. The outcome after interventions and two hours of observation, the patient's complain about her pain had decreased from a scale of 4 to 2. The patient said she felt comfortable but still looked a little anxious about her condition because the patient would be followed up for surgery to remove her kidney stones. The role of nurses during treatment is very important in order to improve the comfort and quality of life of patients

Keywords: Kidney stones, nephrolithiasis, acute pain

1. Introduction

Kidney stones are a common public health problem and an ever-increasing prevalence around the world. Kidney stones increase to 14.8% with a prevalence in men of 10-12% and women of 5-7% (Geng et al., 2022). The prevalence of kidney stones is 6 per 100 population/1,499,400 Indonesian people suffering from kidney stones with an age range of 30-60 years. The American Urologic Association and the European Association Of Urology Recommend related to the prevention of recurrence by assessing diet and treatment (Suwarni & Setyaningrum, 2025). Consuming tea is very popular with the Indonesian people, especially in the dry season to quench their thirst, this is also the trigger for the formation of kidney stones (Budi Utami et al., 2020). Kidney stones are divided into 4, namely calcium stones caused by too much oxalate in the urine, uric acid which is a hard body that is formed due to chemicals in the urine, struvit which is formed due to an infection in the urinary tract, and cystine which is caused by natural substances that leak into the urine (Hadibrata & Suharmanto, 2022).

Urolithiasis or stones in the urinary system is a condition where there are stones in the urinary tract in the form of crystals that settle in the urine, some of the terms urolithiasis are based on the location of the stones, namely:

- a. Stones in the kidneys (Nephrolithiasis)
- b. Stones on the ureters (Ureterolithiasis)
- c. Bladder stones (Vesicolithiasis)
- d. Stones on the urethra (Uretrolithiasis)

(Setiyadi, 2023)

Kidney stone (Nephrolithiasis) It is the formation of hard stones in the kidneys that come from minerals and salts, calcium and oxalic acid are chemicals that form kidney stones, this comes from waste in the blood that crystallizes and accumulates so that over time stones can form in the kidneys, this can happen to the kidneys, ureters, bladder, and urethr. Because of the formation of kidney stones that can block the flow of urine which causes increased pressure in the kidneys so as to cause pain and discomfort in the sufferer (Hadibrata & Suharmanto, 2022).

Pain is a symptom sign that is felt when a stone enters the ureter. Pain is an unpleasant sensory and emotional experience resulting from actual and potential tissue damage. Untreated pain can result in

mobility and healing time (Nisa & Suandika, 2023).

Factors for the formation of kidney stones are drinking water, lack of exercise, heredity, foods with high uric acid content, excessive vitamin consumption, and infections.

The symptoms will not be felt when the size of the kidney stones is small, the small stones can move into the urinary tract. Large kidney stones will be symptomatic because they can rub against the lining of the ureter's wall which can cause irritation/wounds that result in a change in the color of urine mixed with blood (Sucipto, 2016). Other symptoms such as nausea, vomiting, and pain when urinating (Suwarni & Setyaningrum, 2025).

Based on the case study obtained, a female patient, Mrs. D aged 71, came to the emergency room with complaints of right back pain and pain when urinating, as well as vomiting 1 time on the way to the emergency room, these complaints interfered with daily activities and resulted in discomfort felt by the patient.

Therefore, this report is compiled to describe in depth the nursing care process provided for patients with kidney stones (Nephrolithiasis) who experience pain symptoms.

2. Method

a. Research Design

This nursing care method uses a case study approach using a descriptive design method with the case of a patient with kidney stones (Nephrolithiasis) who experienced the main complaint of acute pain.

b. Research Subject

The subject in this case study is a patient with a kidney stone *diagnosis (Nephrolithiasis)*

c. Data Collection Techniques

The assessment is carried out by directly observing general conditions, awareness, vital signs, and physical examination. Other supporting data were obtained from ultrasound examinations carried out on patients.

The sample of this study is Mrs. D who was diagnosed with kidney stone disease with acute pain problems at the Emergency Facility of PKU Muhammadiyah Hospital Bantul.

3. Result and Discussion

3.1. Result

3.1.1. Case Overview

A 71-year-old woman came to the Emergency Installation (IGD) of the Hospital with complaints of right back pain accompanied by pain when urinating without blood, while going to the hospital the patient vomited 1 time in the car. Patients said that when urinating, they felt pain and were incomplete, so it greatly interfered with daily activities. The results of the vital signs examination showed blood pressure of 171/76 MmHg, pulse 90x/minute, temperature 36.0 C, spo2 98%, respiratory rate with a respiratory rate of 20x/minute.

The results of the ultrasound examination showed the following results:

- a. There are stones in the left right kidney (2-5 mm)
- b. There is an enlargement of the right kidney
- c. There is an infection in the right left kidney

3.1.2. Nursing diagnosis

Acute pain

Patient established nursing diagnosis Acute pain (D.0077) associated with infection is characterized by the patient complaining of 4 scale pain in the right and back right waist. The nursing care plan is prepared referring to the main output, namely the Pain Level (L.08066) as stated in the Indonesian Nursing Output Standard (SLKI) with indicators of Ability to complete activities, Pain complaints, Grimace. The main intervention in the Indonesian Nursing Intervention Standard (SIKI) carried out to patients was Pain Management (I.03119) identifying the location, duration, characteristics, scale of pain, and teaching non-

pharmacological techniques (deep breathing relaxation techniques) and the administration of Tofedex 50 mg analgesics.

After acknowledging the implementation and observation for 2 hours related to patient pain complaints has been reduced from a scale of 4 to 2. The patient said he felt comfortable but still looked a little worried about his condition because the patient would be followed up for surgery to remove his kidney stones. The nursing evaluation was carried out at 10.00 WIB with the results of S (Subjective): Patients say pain is less than before O (Objective) : Patient is seen grimacing when pain appears, Patient performs deep breathing techniques, Patient is given Tofedex 50 mg & Tomit.

TD : 171/76 mmHg, N : 90 x/min, S : 36.0 C, Spo2 : 97%

A (Assessment): The acute pain problem is partially resolved, characterized by symptoms such as the patient still seems to be holding pain.

P (Planing) : intervention stopped

3.2. Discussion

Kidney stones can arise from ordinary things done in life such as eating habits, and lack of drinking water, genetics, frequent urination and the formation of kidney stones so that infection will occur along with discomfort in the sufferer. Based on the management of cases of patients with pain complaints which is a subjective response to physical and psychological stressors. Pain is a subjective response to physical and psychological stress. The pain felt is caused by a surgical condition, or trauma that can result in acute pain, chronic pain, caused by a disease condition such as cancer, lower back pain, migraine or joint pain (Nisa & Suandika, 2023). Although pain is due to a health condition, it can affect functional health patterns. In this case, the patient Mrs. D showed symptoms of holding pain and said pain in the right waist and pain when urinating, and there was vomiting 1 time when traveling to the emergency room. In patients who experience acute pain, implementation is given by providing non-pharmacological therapy, namely deep breath therapy. Another implementation used to reduce pain with pharmacological techniques uses Tofedex injection 50 mg/12 hours. Deep breathing relaxation after being implemented directly by the patient can be seen as an effective effect in reducing the scale of pain felt by the patient so that the patient appears more comfortable.

In line with research (Purwati & Anita, 2025) Relaxation techniques are effectively used to combat mild to moderate pain, other benefits such as inner calm, reduced anxiety, heart rate stabilization, blood pressure reduction, improved mental health, and better memory. In line with research (Nugroho & Suyanto, 2023) It has been proven that deep breathing relaxation techniques are effective in reducing pain in postoperative patients as well, this can be supplemented with other techniques.

The deep breath relaxation technique is a technique that stimulates the body to excrete endogenous opioids and the occurrence of pain suppression. These hormones inhibit the implus of pain so that it can reduce the perception of pain. Deep breathing relaxation involves only muscles and respiration that do not require tools and can be done anywhere according to the patient's condition. Calculations to determine the scale of pain using Numeric Rating Scale (NRS) i.e. 0 = no pain, 1-3 = mild pain, 4-6= moderate pain, 7-9= severe pain controlled, 10= severe uncontrolled pain(Veranika et al., 2025).

4. Conclusion

Nursing diagnosis in Mrs. D of acute pain related to infection. The action plan is carried out to reduce the level of pain to provide comfort to the patient. With the provision of appropriate nursing care and the provision of pharmacological and non-pharmacological therapy, pain symptoms can decrease, then apply deep breathing relaxation techniques as intervention support to provide comfort for patients and reduce the level of pain felt by patients. Interprofessional collaboration is a collaboration between the Health Team and different professions to provide quality services to patients and families.

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