Assessment of Pain and Dependency Levels in Patient with Paralytic Ileus Associated with Prolonged Antacid Use: Case Report

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Abstract

Paralytic ileus is a disorder that results in a halt of intestinal flow, causing fluid and gas accumulation. Although paralytic ileus is commonly associated with postoperative conditions, it may also influenced by electrolyte imbalances from long-term antacid use and age-related factors that increase mortality risk. If inadequately unmanaged, the condition can result in significant pain, increased risk of complications, and greater care dependency. Purpose: To describe a case of paralytic ileus in an elderly patient with long-term antacid use and evaluate changes in pain intensity and care dependency during treatments. This case report involved a 74-year-old male patient with paralytic ileus and a primary nursing diagnosis of acute pain. Pain intensity and care dependency were assessed using the Numeric Rating Scale and Care Dependency Scale during a four-day hospitalization period. Results: The patient showed clinical improvement, include the return of flatus and defecation, normalization of electrolyte levels, reduced pain intensity (NRS 6 to 3), and increased independence (CDS 46 to 62). Nursing care included electrolyte correction and pain management through pharmacological therapy and guided imagery, which contribute to decreased pain an improved care dependency, particularly in continence-related aspects. Recall bias related medication history was identified as a limitation. This case underscores the importance of early recognition of electrolyte imbalance and comprehensive nursing assessment in patients with paralytic ileus. Holistic nursing care supported by multidisciplinary collaboration and non-pharmacological intervention played a critical role in enhancing patient outcomes and promoting functional independence during hospitalization.

Keywords: Antacids, Electrolyte Imbalance, Care Dependency Scale, Guided Imagery, Paralytic ileus

Introduction

Paralytic ileus is the cessation of motility of the gastrointestinal tract so that the entire intestine becomes paralyzed and swollen (Finsterer & Strobl, 2024; Mclatchie & Borley, 2013). There is a disorder of the nervous system and reduced contraction of the intestinal wall muscles that regulate bowel movements, so that the intestine fails to channel peristaltic waves and functional obstruction occurs, leading to the accumulation of fluid and gas in the intestine (Weledji, 2020; Vilz et al., 2017).

Recent prevalence data on paralytic ileus globally are limited. According to the Global Burden of Disease (2021), 15.8 million cases of paralytic ileus and intestinal obstruction occurred globally and resulted in 232,000 deaths in 2021. However, specific data on the prevalence of paralytic ileus in Indonesia is not yet available. In a study conducted by Solanki et al. (2020) in the United States, the number of hospitalized patients with paralytic ileus diagnosed increased from 362,561 cases in 2001 to 470,110 cases in 2011. In that period, the highest hospitalization rate was recorded in the age group 65-79 years (elderly).

In the digestive system, about 6-8 liters of fluid enter the small intestine daily, most of the fluid is absorbed before reaching the colon, and about 75% of intestinal gas is swallowed by air. When an obstruction occurs, fluid, gas, and bowel contents accumulate in the proximal part or near the obstruction, causing swelling (Lewis et al., 2019). The bowel proximal to the obstruction dilates, and the bowel below the obstruction continues to undergo normal peristalsis and absorption until it becomes empty and collapses. Initially, peristalsis increases in an attempt to resolve the obstruction, but if the obstruction is not resolved, the bowel will continue to dilate and eventually, there is a decrease in peristaltic force resulting in paralysis (Bailey et al., 2018).

Signs of ileus are the cessation of any motor activity in the abdome,n with other complaints that can appear are nausea, vomiting, loss of appetite, absence of flatus, and constipation (Bailey et al., 2018). There may also be abdominal pain and bloating due to abdominal distension. On auscultation, there is a decrease in bowel noise, and there may be a "rattling" sound due to the dilated small bowel (Mclatchie & Borley, 2013). The diagnosis of paralytic ileus can be made in the presence of nausea, vomiting, abdominal distension, tympanic or dullness on percussion, and air or fluid-filled loops in the small and/or large bowel on abdominal X-ray (Mclatchie & Borley, 2013). If the abdominal X-ray is not clear enough, a CT scan of the abdomen and pelvis is used to confirm the diagnosis of postoperative ileus (Weledji, 2020).

Paralytic ileus treatment is supportive by maintaining adequate hydration and electrolyte levels, maintaining a nasogastric tube, and regular auscultation of the abdomen for the return of bowel sounds (Finsterer & Strobl, 2024). The return of bowel function occurs in the order of the small bowel, the large bowel, and then the stomach. This pattern allows for the passage of feces, and the bowel begins to function normally (Mclatchie & Borley, 2013). Therapy consists of improving the patient's general condition through bed rest, preparing the patient to fast to "rest" the intestines, inserting an IV, followed by the administration of crystalloid fluids such as Ringer Lactate or NaCl 0.9%, and inserting a Nasogastric Tube (NGT) for decompression to reduce pain, nausea, and vomiting in the patient (Weledji, 2020).

Pathophysiologically, the decreased gastrointestinal motility activity in paralytic ileus is related to dysregulation of the enteric nervous system and a complex neuroimmune response. The cause of paralytic ileus is not fully established, but the condition commonly arises as a postoperative complication, particularly after abdominal surgical procedures. In addition to surgical procedures, paralytic ileus can also be caused by several other pathological conditions such as peritonitis, systemic inflammatory responses (e.g., acute pancreatitis and appendicitis), electrolyte balance disturbances, and spinal cord injury (Lewis et al., 2019). Advanced age is an important predisposing factor, with paralytic ileus patients aged ≥65 years showing up to four times higher mortality risk than adults aged 18-64 years (Elgar et al., 2022). In addition, comorbidities

such as pneumonia, stroke, and electrolyte disturbances exacerbate motility dysfunction in the gut (Alahmari et al., 2021).

Electrolyte imbalance is one of the clinical conditions that can be found in patients with gastrointestinal disorders, including paralytic ileus. Electrolyte disturbances affect calcium ion transport into smooth muscle cells of the small intestine and colon, which is necessary for smooth muscle contraction (Wintery et al., 2003). Electrolytes, including sodium, potassium, and calcium, play an important role in maintaining the electrical balance of cells and supporting the work of nerves and muscles in the body (Shrimanker & Bhattarai, 2023). Electrolyte imbalance itself can arise due to drug side effects which then disrupt intestinal smooth muscle function due to low levels of potassium and sodium, thus inhibiting normal peristaltic activity (Chukwuemeka et al., 2022).

Research by Satake et al. (2021) identified several drug groups that have a high potential to cause paralytic ileus or gastrointestinal obstruction through a mechanism of decreased gut motility, such as barium sulfate, potassium, or phosphate-lowering drugs, oral laxatives, antipsychotics, and antidepressants. Although antacids and gastric acid-lowering drugs such as PPIs were not found to have a direct association with paralytic ileus in these studies, some case reports reported a potential association. These include a case of ileus in a postpartum mother following magnesium sulfate administration (Al-Shoha et al., 2015), as well as a case of an elderly person who developed ileus following ingestion of a combination of laxatives and antacids, including magnesium and aluminum (Kutlay Aydın et al., 2019). These findings suggest that drugs generally considered safe may still affect gut motility, especially in vulnerable groups.

Another important condition that needs to be considered in patients with paralytic ileus is the appearance of pain, which is often accompanied by limitations in performing independent activities. Pain in this condition is generally the result of a combination of bowel distension, enteric nervous system dysfunction, and inflammatory response (Daniels et al., 2015). Pain monitoring allows early detection of paralytic ileus, enabling timely intervention that can prevent further complications such as bowel perforation and prolonged hospitalization (Daniels et al., 2015). In addition to pharmacological therapy, nurses can provide non-pharmacological interventions such as guided imagery therapy for pain management in paralytic ileus patients. Research by Nur Rofi'ah et al. (2023) showed that this intervention was effective in preoperative paralytic ileus patients in reducing the pain scale from 6 to 5 in three days of care while increasing patient comfort.

Pain due to paralytic ileus is one of the main factors that increase the level of dependency of patients, in addition to other causes such as electrolyte imbalance and systemic disorders. The complexity of etiology has a direct impact on the treatment process and clinical recovery. Research by Nazzani et al. (2019) showed that patients with paralytic ileus experienced prolonged lengths of hospitalization and increased care needs. Although in the study by Nazzani et al. (2019), the pain was not explicitly measured, its impact was reflected in increased length of stay, costs, and need for supportive care, all of which indicate that the more severe the pain and symptoms of ileus, the higher the level of functional dependency of the patient.

Instruments such as the Care Dependency Scale (CDS) can be used to assess the extent to which patients require assistance in fulfilling basic needs. Research by Piredda et al. (2022) showed that CDS is effective in identifying dependency in cancer patients, especially when affected by pain that affects both physical and psychosocial aspects. Systematic monitoring of dependency with CDS plays an important role in detecting an early decline in independent functioning, designing appropriate interventions, and helping to reduce the risk of complications, accelerate recovery, and reduce the cost of care in patients with paralytic ileus.

Currently, there are limited studies that systematically examined the association between long-term antacid use and the occurrence of paralytic ileus, particularly among high-risk patient groups. In addition, this report highlights an aspect that has not been the main focus of similar studies, the impact of paralytic ileus on pain intensity

and care dependency, the key components of nursing assessment related to basic needs and intervention effectiveness.

This case report aims to describe the course of nursing care in a patient with paralytic ileus suspected to be triggered by long-term medication use, specifically antacids, and evaluate the patient's pain intensity and level of care dependency during four days of hospitalization. By highlighting these aspects, it is hoped that this report contributes to expanding clinical insight into the long-term effects of antacid use and underscores the importance of a multidimensional approach in the management of patients with paralytic ileus.

Research Method

This case report was conducted in the surgical inpatient room of one of the hospitals from 23-26 September 2024. The research design uses a case study design with a nursing care approach that focuses on the main nursing problem, namely acute pain, and assesses the patient's level of dependence during treatment. The subject in this study was a 74-year-old male with a medical diagnosis of paralytic ileus, who had hypertension, gastritis, and a history of taking over-the-counter drugs, especially antacids. Data were collected by physical examination, observation, interview, and secondary data obtained from medical records.

In measuring the level of pain experienced by patients, an assessment is carried out using the Numeric Rating Scale (NRS) instrument and the results of vital signs in the form of blood pressure, pulse frequency, and respiratory frequency. The Numeric Rating Scale (NRS) is a screening instrument used to subjectively evaluate pain intensity with a range of values from 0 to 10, where the number 0 indicates "no pain at all" and the number 10 represents "the most intense pain that can be felt by the patient" (Nugent et al., 2021).

Non-pharmacological pain management as an additional therapy for pain management is given to patients, in the form of guided imagery therapy interventions carried out following standard operating procedures based on the research of Kodeeswara and Subhash (2015). The duration of the intervention was carried out for 5-10 minutes once a day within 3 days during the day before the patient rested or in the afternoon after the patient rested. After the intervention, patients were evaluated regarding the pain scale using the Numeric Rating Scale (NRS).

Measurement of the patient's level of dependency was done through history taking and observation assessed with the Care Dependency Scale (CDS) instrument. The CDS instrument consisted of 15 question items with scoring done using a five-point Likert scale. A score range of one indicates completely dependent, two indicates highly dependent, three indicates partially dependent, three indicates partially dependent, four indicates somewhat independent, and five indicates independent. Each patient can obtain a total score between 15 to 75 points, where lower scores reflect higher levels of dependence on care (Nursiswati et al., 2020). The CDS score classification is categorized as follows: score 15 - 24 completely dependent, score 25 - 44 highly dependent on care, score 45 - 59 partially dependent on care, score 60-69 dependent to a limited degree, and score 70 - 75 independent in care. There are 15 question items on the CDS instrument, namely eating and drinking, incontinence, posture, mobility, day or night patterns, dressing, body temperature, hygiene, avoiding danger, communication, contact with others, normal rules and values, daily activities, leisure activities, and learning ability.

This study was conducted after obtaining permission from the room nurse and the consent of the patient and family after a thorough explanation of the study, including the rights and responsibilities of respondents, the purpose of the study, and the guarantee of confidentiality of patient data. After the explanation, the patient signed the consent form that had been prepared.

Case Description

Mr. A, a 74-year-old man, was admitted to the surgical inpatient ward on 23 September 2024 due to right upper quadrant abdominal pain with a scale of 6/10 accompanied by complaints of constipation and unable to flatus since 9 days before admission. The

patient has a history of taking antacid drugs for approximately the last 10 years. Based on the results of the assessment in the emergency room, the patient was indicated for colostomy. Thus, the patient was transferred to the male surgical inpatient ward. The patient had a history of gastritis and had a frequent habit of taking antacid drugs every month. In addition to gastritis, the patient also had untreated hypertension.

At the time of arrival to the surgical inpatient ward, the patient's general condition was moderate pain, compos mentis consciousness (E4V5M6), and an NGT was attached for gastric decompression. There was a brownish liquid output of +- 30 cc on the NGT and the patient was fed from 23nd to 25th September 2024. Based on the examination of vital signs, BP: 150/87 mmHg, Temperature: 37.1°C, HR: 90 x/min, RR: 23 x/min, SaO2: 98%, LLA: 23 cm, BMI: 18.4, weight after illness: 50 kg (there was a decrease of +-5kg, according to the patient the clothes felt looser), TB: 155 cm. Based on the results of the physical examination of the abdomen, there was abdominal distension, intestinal noise 3x / min sounded faint and distant, dullness in the right upper quadrant abdomen, and based on the results of palpation there was pain in the right upper quadrant. Based on the examination of the urinary system, the patient was attached to a urine catheter with a dark yellow urine color of 300 cc, and there was supra pubic pain.

The results of the PQRST pain assessment are as follows, provocation/palliation of pain is more pronounced when the effect of pain relievers has run out and the pain is lighter when given medication, pain quality is like stabbing, pain region is felt in the right upper quadrant abdomen, severity or pain scale is 6/10, and pain timing is felt to be intermittent. The initial results of the CDS examination were in the partially dependent category, with a total score of 46. The patient underwent a 3-sided abdominal ultrasound examination on 23 September 2024 with the following results: Preperitoneal fat was normal, Psoas line and contours of both kidneys were normal, Air shadows in the intestines and colon appeared dilated, In the upright position free air (-), air-fluid level (+) with opaque ridge in the pelvic cavity. Impression: Suspicious paralytic ileus with urine retention.

The patient also underwent a hematological examination and electrolyte examination on 23 September 2024. Leucocyte 16,280/mm3 (leukocytosis), ureum 137 mg/dL (uremia), and creatinine 4.78 mg/dL were higher than normal. The electrolyte examination also showed electrolyte imbalance with sodium 127 mEq/L (hyponatremia), potassium 5.7 mEq/L (hyperkalemia), chloride 94 mEq/L (hypochloremia), and calcium 4.09 mg/dL (hypocalcemia). The pharmacological and fluid therapies administered to the patient during hospitalization included the following: omeprazole 10 cc IV injection twice daily (2×1), ketorolac 4 mL IV injection three times daily (3×1), ondansetron 4 cc IV injection three times daily, Asering at 20 drops per minute via IV macrodrip, normal saline (NaCl) at 20 drops per minute via IV macrodrip, metronidazole 100 mL three times daily via IV macrodrip, ceftriaxone 10 cc twice daily via IV macrodrip, Fleet enema 133 mL once daily (1×1) administered rectally, Calitoz 500 mg three times daily taken orally with or without food, and calcium polystyrene sulfonate 5 g three times daily, taken orally at least three hours before or after other medications.

Results

Interventions that can be done to overcome the problem of acute pain, namely pain management by observing location, duration, frequency, pain scale, non-verbal pain response, facilitating rest and sleep, collaborating with doctors for analgesic administration (ketorolac), providing catheter care, and providing supporting non-pharmacological therapy in the form of guided imagery therapy. As for monitoring the patient's level of dependence using the CDS instrument to monitor the patient's ability to fulfill his basic needs independently.

Follow-up electrolyte examinations demonstrated a clear trend toward normalization during hospitalization. After the pharmacological and fluid therapies, repeat testing after 3 days admitted revealed normalization of sodium (140 mmol/L), potassium (4.3 mmol/L), and chloride (108 mmol/L) levels, while calcium levels

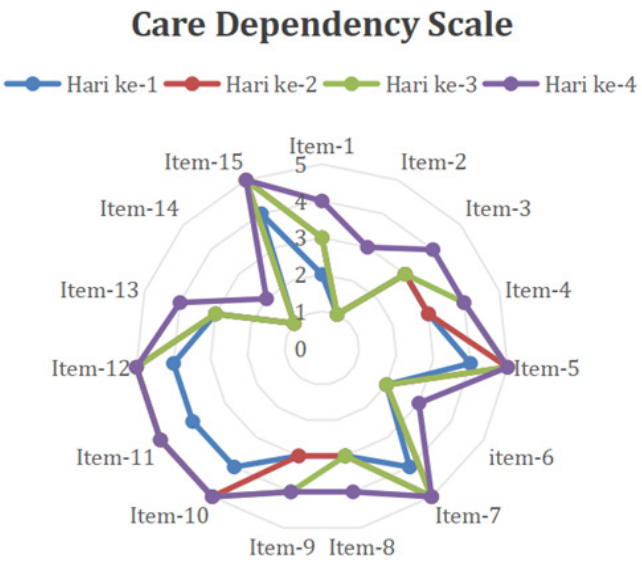
remained mildly low (4.45 mg/dL). These findings indicate a positive response to electrolyte correction, although continued monitoring of calcium levels is warranted.

Based on clinical progress notes in table 1.2 there are changes related to pain complaints and the patient's level of dependence. There is a gradual decrease in pain scale accompanied by improved vital signs within the normal range. From the patient's perspective, there is a decrease in pain frequency as the combined medical treatment and guided imagery intervention resulted greater comfort and a sense of calm during the hospitalization. The patient's level of dependence is also periodically improving where there is an improvement in continence, as well as eating and drinking patients. The results of the intervention analysis on the assessment of pain level, dependence level, blood pressure, pulse frequency, and breath frequency in this study are presented in Table 1.2 below:

Table 1.2 Intervention Analysis Results

Variables	Day 1	Day 2	Day 3	Day 4
NRS Score	6/10	5/10	4/10	3/10
CDS Score	46	49	54	62
Blood Pressure	150/87	149/83	154/85	153/89
Heart Rate	90	80	65	72
Respiratory Rate	23	20	21	19
Pain Complaints (PQRST)	P: Pain is more pronounced when the effect of pain relief is exhausted and pain is less when given medication Q: Stabbing pain R: Pain felt in the right upper quadrant abdomen S : 6/10 T: Pain is perceived as intermittent	P: Pain is more pronounced when the effect of pain relief is exhausted and pain is less when given medication Q: Stabbing pain R: Pain felt in the right upper quadrant abdomen S: 5/10 T: Pain is perceived as intermittent	P: Pain is more pronounced when the effect of pain relief is exhausted and pain is less when given medication Q: Stabbing pain R: Pain is felt in the right upper quadrant of the abdomen, but the pain is not as severe as the previous day. S: 4/10 T: Pain is perceived as intermittent	P: Pain is more pronounced when the effect of pain relief is exhausted and pain is less when given medication Q: Stabbing pain R: Pain is felt in the right upper quadrant of the abdomen, but the pain is not as severe as yesterday. S: 3/10 T: Pain is intermittent, but is less frequent today.

The results of the development of the patient's level of dependency using the Care Dependency Scale (CDS) instrument for four days are presented on radar chart 1.1 as follows:



Radar Chart 1.1 Development of Mr A's Dependency Level. Mr A for 4 Days
Item 1; eating and drinking, item 2; incontinence, item 3: posture, item 4; mobility, item 5; day or night patterns, item 6; putting on and taking off clothes, item 7; body temperature, item 8; hygiene, item 9; avoiding danger, item 10; communication, item 11; contact with others, item 12; normal rules and values, item 13; daily activities, item 14; leisure activities, and item 15; learning ability

Based on the radar chart 1.1, there are changes in each item of the CDS instrument for 4 days. Based on 15 items, there is an item with the highest increase in item no 2, incontinence, where there is an increase from a score of 1 to a score of 3. In the eating and drinking item, there is a gradual increase from a score of 2 on the first day, to a score of 4 on the last day. In other items, there was a one-point increase.

Compliance with the intervention was evaluated through daily nursing observations, which showed that patients were consistently willing to attend scheduled guided imagery sessions. The intervention was well tolerated, with no reports of discomfort or refusal, and patients expressed their willingness to continue the intervention during their hospital stay. Patients were also cooperative during daily evaluations using the CDS instrument, which included vital sign checks, observations, and interviews. No adverse or unexpected events were observed during the implementation of nursing and medical interventions during the hospitalization period.

Discussion

Management of Paralytic Ileus

In this case, a 74-year-old patient with a history of gastritis had a habit of taking over-the-counter antacid drugs of 3-5 tablets every month for more than 10 years. The reason the patient always took antacid drugs every month was that sometimes the patient felt abdominal pain due to his gastritis, but the patient had never sought treatment or special examination from a health worker. So, what the patient did was take over-the-counter antacid drugs without a doctor's supervision to treat her gastritis for many years.

Antacids are medicinal preparations used to neutralize stomach acid and relieve dyspeptic symptoms, such as heartburn and nausea (Liamis et al., 2008). Antacids are commonly used as self-prescribed drugs whose main ingredients include basic compounds such as magnesium hydroxide ($Mg(OH)_2$), aluminum hydroxide ($Al(OH)_3$), and calcium carbonate ($CaCO_3$) (Hamid, R et al., 2014). Each of these substances works by chemically reacting with hydrochloric acid (HCl) in the stomach, producing salt and water, thereby reducing stomach acidity (Maton, P. N., & Burton, M. E., 1999). However, some antacid ingredients have the potential to disrupt the body's electrolyte balance. For example, magnesium-containing antacids may cause

hypermagnesemia. In contrast, aluminum-based antacids may cause hypophosphatemia due to aluminum's ability to bind phosphate in the gastrointestinal tract. The calcium content of antacids can also cause hypercalcemia if consumed in large quantities or in the long term (Maton, P. N., & Burton, M. E., 1999).

Based on the case findings, the patient had a history of long-term antacid use; however, the patient was unable to specify the type and amount of antacids most frequently consumed. Despite this limitation, the available clinical data were consistent with the presence of electrolyte imbalance. Based on the initial electrolyte examination on the first day of hospitalization, the patient exhibited multiple electrolyte disturbances, including hyperkalemia, hypochloremia, hyponatremia, and hypocalcemia. These findings are consistent with previous reports suggesting that prolonged antacid use may alter electrolyte balance. Maton and Burton (1999) reported that antacid formulations, particularly those containing mineral components, can influence serum electrolyte levels, including calcium and potassium. This association supports the possibility that long-term antacid use contributed to the electrolyte imbalance observed in this patient.

Several similar case reports have documented the association between hypermagnesemia or electrolyte imbalance due to the consumption of antacids or magnesium-based laxatives with paralytic ileus, especially in elderly patients or those with impaired renal function. In a report by Al-Shoha et al. (2015), a 21-year-old postpartum mother developed paralytic ileus after receiving magnesium sulfate therapy for preeclampsia. Abdominal distension and decreased consciousness were the main complaints and improved after electrolyte correction with calcium infusion and diuresis. Meanwhile, another case reported by Aydın et al. (2020) described an elderly woman with a history of consumption of antacids and laxatives containing magnesium hydroxide, sodium phosphate, and a combination of aluminum hydroxide and magnesium carbonate, who developed paralytic ileus accompanied by decreased consciousness and respiratory distress. Supportive therapy, including discontinuation of magnesium exposure, calcium infusion, intravenous fluids, diuresis, and mechanical ventilation, resulted in gradual improvement of the patient's condition. These two cases highlight the importance of considering the electrolyte side effects of antacids and other magnesium content as potential triggers of paralytic ileus, as well as the importance of closely monitoring electrolytes and bowel function, especially in patients with high-risk factors.

Another risk factor for paralytic ileus found in cases is the age of the patient, who is entering old age (elderly). In a study by Elgar et al (2022), based on the results of a retrospective analysis of 81,674 patients with a diagnosis of paralytic ileus, it was found that the age factor had a significant effect on mortality. Elderly patients (≥65 years) had a four times higher risk of death than adult patients (18-64 years), with mortality rates of 3.0% and 0.7%, respectively. Each one-year increase in age consistently increased the risk of death, both in patients with paralytic ileus who underwent surgery and those who did not. The findings of the Elgar et al (2022) study emphasize the importance of considering advanced age as a major prognostic factor in the clinical management of paralytic ileus patients.

The management of paralytic ileus is in the form of supportive therapy consisting of improving the patient's general condition through bed rest, preparing the patient for fasting, and infusion, followed by the administration of crystalloid fluids such as lactated Ringer's or NaCl 0.9%. Nasogastric tube (NGT) insertion is done for gastric decompression to reduce pain, nausea, and vomiting in patients, and patients are given total parenteral nutrition (Mclatchie & Borley, 2013). A urine catheter was inserted for 24-hour urine monitoring, followed by vital signs monitoring such as blood pressure, pulse, temperature, and respiratory frequency. The patient was prepared to fast until bowel sounds were heard and the patient could pass gas spontaneously. Pharmacological therapy is needed in addition to supportive therapy, such as potassium correction protocols for patients with electrolyte imbalances such as hypokalemia, or antibiotics for patients with paralytic ileus due to sepsis (Mclatchie & Borley, 2013). Appropriate therapy is needed

in patients with ileus to reduce symptoms and length of hospital stay (Wattchow et al., 2020).

Pharmacological therapy is adjusted to the underlying cause such as electrolyte correction or antibiotic administration (Weledji, 2020). In this case, the patient received fluids and NaCl, antibiotics (metronidazole and ceftriaxone) because, based on laboratory results, there were more than normal leucocyte values, antiemetics (ondansetron), and analgesics (ketorolac). The patient also underwent NGT decompression and temporary parenteral nutrition, according to the conservative therapy protocol. Based on the laboratory examination results, the patient also had electrolyte imbalance, which was corrected by administering pharmacological therapy of fluid replacement (to treat hyponatremia), calitoz (to treat hypocalcemia), and calcium polystyrene sulfonate (to reduce potassium or hyperkalemia).

On 25 September 2024, there was a positive health development in patient, namely the patient's electrolyte labs were all within the normal range, the patient's bowel noise increased 5x/min, and the patient could flatulate. However, the patient still had constipation. Administration of a fleet enema or purgative laxative (sodium phosphate monobasic and dibasic) is an appropriate first-line pharmacological therapy to be given to constipated patients and is considered better than other osmotic laxatives (Aghakhani, N et al., 2022). In our case, the patient was given a fleet enema on 26 September 2024 and had gradual defecation with liquid consistency. After monitoring until 27 September 2024, the patient could go home while still using a urine catheter and was planned to return for control a week later. The patient was not given any discharge medication by the doctor and was recommended to eat easily digestible food to prevent constipation from occurring again.

Pain Development and Management

In addition to causing discomfort and activity limitations, paralytic ileus can also trigger pain due to abdominal distension (Weledji, 2020). Stoppage of bowel movements causes a build-up of gas and fluid that stretches the intestinal wall, resulting in abdominal distension, as well as pain and discomfort. On the other hand, disruption of the enteric nervous system due to stress or pain can increase visceral sensitivity. Local inflammatory responses in reaction to motility disorders also exacerbate abdominal pain experienced by patients (Daniels et al., 2015). The existence of various combinations of factors causing pain in paralytic ileus patients needs to be studied thoroughly and continuously. Pain monitoring allows early detection of paralytic ileus, enabling timely intervention that can prevent further complications such as bowel perforation and prolonged hospitalization (Daniels et al., 2015).

The results of the assessment in the case showed that the patient reported pain on a scale of 6 in the right upper quadrant abdomen. Pharmacological therapy, ketorolac, was given to the patient once a day for pain management and monitoring of the pain scale using the Numeric Rating Scale (NRS), as well as the development of vital signs (blood pressure, respiratory frequency, and pulse frequency). Based on the findings from the study by Waardenburg et al. (2021), a decrease in the Numeric Rating Scale (NRS) score was shown to have a significant correlation with improved clinical conditions in patients with chronic pain. A decrease of ≥2 points on the NRS scale was identified as the minimum threshold for meaningful clinical improvement, while in patients who had completed therapy, the average decrease reached more than 4 points. This finding suggests that a reduction in pain intensity, as reflected through a decrease in NRS score, not only reflects the subjective perception of the patient but is also an objective indicator of the effectiveness of the therapy provided. Thus, regular monitoring of NRS reduction can be used as an important parameter in evaluating pain intervention outcomes and supporting holistic clinical decision-making.

In addition to pharmacological therapy, one of the pain management efforts applied to patients is non-pharmacological therapy, namely guided imagery. In pain management, guided imagery therapy is given as an additional non-pharmacological therapy that is suitable for patients, because patients who

still have good cognition are cooperative in following directions during the technique, and can use imagination based on their memories. Previous studies have shown that guided imagery intervention is effective in reducing pain in various patient groups, such as patients with pre-operative paralytic ileus (Nur Rofi'ah et al., 2023), patients undergoing port catheter insertion under local anesthesia (Acar & Aygin, 2019), COVID-19 patients (Aghakhani et al., 2021), patients in the inpatient Progressive Care Unit (Parizad et al., 2021), patients with burns during dressing changes (Acar & Hasan Ersöz, 2023), and postoperative patients under general anesthesia (Patricolo et al., 2017).

Guided imagery is a therapeutic technique that involves focused visualization and sensory imagery to stimulate positive psychophysiological responses, thereby supporting recovery and reducing pain, stress, and tension (Pieczynski et al., 2020). The effectiveness of this technique is greatly influenced by the appropriateness of the imagery used, as each individual's perception of a particular visualization can vary (Rateau, 2020 in Kerrie, 2024). In this case, the patient revealed that the rice field atmosphere provided calmness for him. Therefore, guided imagery therapy was adapted to the patient's personal experience, namely imagining being in rice fields and gardens, and focusing on sensory details such as the sound of water, birds singing, and wind blowing. This approach is intended to create an atmosphere of relaxation to help relieve the patient's pain.

The results of the intervention evaluation, which included pharmacological therapy and non-pharmacological therapy in the form of guided imagery showed a decrease in pain scores based on the Numeric Rating Scale (NRS), from an initial value of 6 on the first day to 3 after four days of intervention. This decrease reflected a clinically meaningful improvement in the patient's pain perception. In addition, improvement was also reflected in the stabilization of vital sign parameters, such as a decrease in respiratory frequency and blood pressure, which were previously elevated due to pain. These findings support that a combination of pharmacological and non-pharmacological approaches based on guided imagery can have a gradual positive impact on reducing pain complaints, as well as improving the patient's overall clinical condition.

Development of Nursing Dependency

The level of dependency was also monitored daily using the Care Dependency Scale (CDS) instrument, which is a standardized instrument and consists of 15 questions regarding the patient's ability to fulfill basic needs independently. Based on the results of the initial assessment, the patient's level of dependence was at a score of 46, indicating that the patient was partially dependent on care. On the first day, the patient was fully dependent on the aspect of incontinence due to using a urinary catheter, as well as on the aspect of recreational activities because the patient was bedridden. In the aspect of dressing, the patient was very dependent because he had limited movement due to abdominal pain, an IV attached to his right hand, and the use of a urinary catheter. The patient was also partially dependent on the aspects of eating and drinking, posture, mobility, personal hygiene, ability to avoid danger, and daily activities. Meanwhile, for aspects of day and night sleep patterns, body temperature regulation, communication, social interaction, understanding of normal rules and values, and learning ability, the patient showed a rather high level of dependence.

Systematically monitoring the level of dependence allows early detection of a decline in independent function, thus supporting the provision of timely interventions, reducing the risk of complications, shortening the length of hospitalization, and reducing the cost of care associated with paralytic ileus (Nazzani et al., 2019). In this case, monitoring the level of dependence using the CDS instrument was carried out by observation and interviewing the patient once every day for 4 days. After monitoring for 4 days, there was an increase in the score along with improvements in the patient's disease, such as stable electrolytes, and the highest increase because the patient was able to defecate and flatus. The improvement in the patient also contributed to the significant increase in CDS score, especially in the incontinence item.

This proves the effectiveness of collaborative interventions on the recovery of patients in fulfilling their basic needs independently. These results are in line with research by Dijkstra et al. (2005), which showed that improvements in patients' physical health status correlated with increased independence in aspects of self-care, including elimination control.

Interventions that included pharmacological management of paralytic ileus, non-pharmacological guided imagery, and nursing status monitoring supported a positive outcome of improvement in the patient's clinical condition. In this case, the etiological management focused on restoring electrolytes within the normal range and restoring elimination ability, especially defecation and flatus. In conjunction with the improvement in the patient's condition, there was also a decrease in pain intensity, mainly due to the reduction of abdominal distension, which is the main source of pain. At the dependency level, there was an increase in the CDS score, due to the improvement of the disease and decrease in pain, so that the patient could defecate independently, change position independently, and eat or drink partially dependent.

However, this case report has limitation of potential recall bias, considering that the use of antacids that have been going on for a long period of time makes it difficult for patients to remember in detail the amount, type, and duration of antacid use, including the possibility of unrecorded use of other over-the-counter drugs. In addition, this study is a case report that provides only an initial clinical description of one individual, and therefore the findings cannot be generalized to a broader population.

Conclusion

This case underscores the importance of early recognition of electrolyte imbalance and comprehensive nursing assessment in patients with paralytic ileus. Holistic nursing care supported by multidisciplinary collaboration and non-pharmacological intervention played a critical role in enhancing patient outcomes and promoting functional independence during hospitalization. During the four-day hospitalization period showed an improvement in the patient's condition, characterized by improved electrolytes within the normal range, the ability to defecate and flatus, as well as a decrease in pain monitoring scores and an increase in dependence level scores. From the patient's perspective, the combination of medical treatment and guided imagery intervention contribute to greater comfort and a sense of calm during the hospitalization, enabling the patient to gradually increase independence in daily activities. These findings highlight the value of individualized and integrated nursing interventions in supporting recovery patient. Future research can be conducted by focusing on risk factors for paralytic ileus at large.

Written informed consent was obtained from patient for the publication of this case report.

References

Acar, K., & Aygin, D. (2019). Efficacy of Guided Imagery for Postoperative Symptoms, Sleep Quality, Anxiety, and Satisfaction Regarding Nursing Care: A Randomised Controlled Study. *Journal of PeriAnesthesia Nursing*, 34(6), 1241-1249. https://doi.org/10.1016/j.jopan.2019.05.006

Acar, K., & Ersöz, H. (2024). Effect of Guided Imagery on Patient Comfort, Vital Signs, Pain, Anxiety, and Satisfaction in Cancer Patients Undergoing Port Catheterisation With Local Anaesthesia. *Cancer Nursing*, 47(2), 93-99. https://doi.org/10.1097/NCC.0000000000001194

Aghakhani, N., Faraji, N., Alinejad, V., Goli, R., & Kazemzadeh, J. (2022). The effect of guided imagery on the quality and severity of pain and pain-related anxiety associated with dressing changes in burn patients: A randomised controlled trial. *Burns*, 48(6), 1331-1339. https://doi.org/10.1016/j.burns.2021.11.020

Alahmari, A. M. A., Alsuayri, A. H. F., Alsadi, H. M. J., Alshahrani, B. K. G., Alyahya, F. M. A., Saadi, S. K. al, Alamri, A. D. A.., Alshahrani, H. S., Alamri, F. T.

M., Alshahrani, M. A. M., Albalawi, A. A., & Alnaim, M. F. (2021). Prevalence and Updated Management of Paralytic Ileus: A Simple Review. *Journal of Pharmaceutical Research International*, 61-66. https://doi.org/10.9734/jpri/2021/v33i42B32425

Al-Shoha, M., Klair, J. S., Girotra, M., & Garcia-Saenz-de-Sicilia, M. (2015). Magnesium Toxicity-Induced Ileus in a Postpartum Patient Treated for Preeclampsia With Magnesium Sulphate. *ACG Case Reports Journal*, 2(1), 227-229. https://doi.org/10.14309/crj.2015.67

Chukwuemeka, H., John, O., Nkechinyere, J., & Ifeyinwa, R. (2022). Paralytic Ileus Secondary to Electrolyte Imbalance: A Case Study in a 16 Year Old Female. *The Korean Journal of Food & Health Convergence*, 8(1), 17-20. https://doi.org/10.13106/kjfhc.2022.vol8.no1.17.

Daniels, A. H., Ritterman, S. A., & Rubin, L. E. (2015). Paralytic Ileus in the Orthopaedic Patient. *Journal of the American Academy of Orthopaedic Surgeons*, 23(6), 365-372. https://doi.org/10.5435/jaaos-d-14-00162

Djikstra, A., TWN Dassen, Veltman, G., & Tiesinga, L. (2005). Diagnostic accuracy of the care dependency scale. *Journal of Advanced Nursing*, 50(4), 410-416. https://hdl.handle.net/11370/f65b7dc9-ca73-4a0f-b202-387bb85677b1

Elgar, G., Smiley, P., Smiley, A., Feingold, C., & Latifi, R. (2022). Age Increases the Risk of Mortality by Four-Fold in Patients with Emergent Paralytic Ileus: Hospital Length of Stay, Sex, Frailty, and Time to Operation as Other Risk Factors. *International Journal of Environmental Research and Public Health*, 19(9905), 9905. https://doi.org/10.3390/ijerph19169905

Elswort Beach, & Orlando Jesus. (2023). Ileus. *Pubmed*. https://pubmed.ncbi.nlm.nih.gov/32644363

Finsterer, J., & Strobl, W. (2024). Gastrointestinal involvement in neuromuscular disorders. *Journal of Gastroenterology and Hepatology*, 39(10), 1982-1993. https://doi.org/10.1111/jgh.16650

Global Burden of Disease. (2021). *Paralytic ileus and intestinal obstruction*. Institute for Health Metrics and Evaluation. https://www.healthdata.org/research-analysis/diseases-injuries-risks/factsheets/2021-paralytic-ileus-and-intestinal

Greg McLatchie, Neil Borley, & Jonna Chikwe. (2013). *Oxford Handbook of Clinical Surgery*.

Henry Bailey, Robert Love, Norman Williams, Ronan O'connell, & Andrew McCaskie. (2018). *Bailey & Love's Short Practice of Surgery*.

Institute for Health Metrics and Evaluation. (2021). Global Health Metrics. www.thelancet.com

Isha Shrimanker, & Sandeep Bhattarai. (2023). Electrolytes. Pubmed.

Janice Hinkle, Kerry Cheever, & Kristen Overbaugh. (2022). Medical-Surgical Nursing 15th Edition.

Kerrie Chambers. (2024, May). Comfort Promotion: Guided Imagery. Elsevier.

Kerry, S., Frank Arnold, & Spencer Dean. (2022). Chronic Constipation in Adults. *American Family Physician,* 1-8.

Kodeeswara, P., & Subhash, J. (2015). Guided Imagery Therapy. 4(5), 56-58. https://doi.org/10.9790/1959-04535658

Kraft, M. D., Btaiche, I. F., Sacks, G. S., & Kudsk, K. A. (2005). Treatment of electrolyte disorders in adult patients in the intensive care unit. In American Journal of Health-System Pharmacy (Vol. 62, Issue 16, pp. 1663-1682). *American Society of Health-Systems Pharmacy*. https://doi.org/10.2146/ajhp040300

Kutlay Aydın, Berk, A. Z., Halise Tokdemir, & Begüm Ergan. (2019). Hypermagnesemia

Induced Paralytic Ileus: A Case with Normal Renal Function and Review of the Literature. *Türk Yoğun Bakım Derneği Dergisi/Türk Yoğun Bakım Dergisi*, 18(2), 103-108. https://doi.org/10.4274/tybd.galenos.2019.86658

Liamis, G., Milionis, H., & Elisaf, M. (2008). A Review of Drug-Induced Hyponatremia. *In American Journal of Kidney Diseases* (Vol. 52, Issue 1, pp. 144-153). https://doi.org/10.1053/j.ajkd.2008.03.004

Maton, P. N., & Burton, M. E. (1999). Antacids Revisited A Review of Their Clinical Pharmacology and Recommended Therapeutic Use.

Nazzani, S., Bandini, M., Preisser, F., Mazzone, E., Marchioni, M., Tian, Z., Stubinski, R., Clementi, M. C., Saad, F., Shariat, S. F., Montanari, E., Briganti, A., Carmignani, L., & Karakiewicz, P. I. (2019). Postoperative paralytic ileus after major oncological procedures in the enhanced recovery after surgery era: A population based analysis. *Surgical Oncology*, 28, 201-207. https://doi.org/10.1016/j.suronc.2019.01.011

Nugent, S. M., Lovejoy, T. I., Shull, S., Dobscha, S. K., & Morasco, B. J. (2021). Associations of Pain Numeric Rating Scale Scores Collected during Usual Care with Research Administered Patient Reported Pain Outcomes. *Pain Medicine*, 22(10), 2235-2241. https://doi.org/10.1093/pm/pnab110

Nur Rofi'ah, S., Hakam, M., Murtaqib, & Mustakim. (2023). Guided Imagery Relaxation for Acute Pain in Pre-Operative Paralytic Ileus Patient: A Case Study. *Journal of Indonesian Medical Emergencies*, 2(1), 74-89. https://doi.org/10.58545/jkmi.v2i1.62

Nursiswati, N., Halfens, R. J. G., & Lohrmann, C. (2020). Psychometric properties of the Care Dependency Scale in stroke survivors in Indonesian hospitals. *International Journal of Nursing Sciences*, 7(3), 330-336. https://doi.org/10.1016/j.ijnss.2020.06.011

Parizad, N., Goli, R., Faraji, N., Mam-Qaderi, M., Mirzaee, R., Gharebaghi, N., Baghaie, R., Feizipour, H., & Haghighi, M.-M. (2021). Effect of guided imagery on anxiety, muscle pain, and vital signs in patients with COVID-19: A randomised controlled trial. Complementary Therapies in Clinical Practice, 43, 101335. https://doi.org/10.1016/j.ctcp.2021.101335

Patricolo, G. E., LaVoie, A., Slavin, B., Richards, N. L., Jagow, D., & Armstrong, K. (2017). Beneficial Effects of Guided Imagery or Clinical Massage on the Status of Patients in a Progressive Care Unit. *Critical Care Nurse*, 37(1), 62-69. https://doi.org/10.4037/ccn2017282

Pieczynski, J., Cosio, D., Pierce, W., & Serpa, J. G. (2020). Mind-Body Interventions for Rehabilitation Medicine. *Physical Medicine and Rehabilitation Clinics of North America*, 31(4), 563-575. https://doi.org/10.1016/j.pmr.2020.07.008

Piredda, M., Candela, M. L., Marchetti, A., Biagioli, V., De Maria, M., Facchinetti, G., Albanesi, B., Iacorossi, L., & De Marinis, M. G. (2022). The Care Dependency Scale: A cross validation study of inpatients with cancer. *European Journal of Oncology Nursing*, 56, 102087. https://doi.org/10.1016/j.ejon.2021.102087

Raniea Hamid, Gusti Noorrizka, Nyoman Wijaya, & Ana Yuda. (2014). Profile of the Use of Antacid Drugs obtained by Self-Medication (Study on Patients of Pharmacy "X" Surabaya). 1. 49-52.

Lewis, S. M., Heitkemper, M. M., Bucher, L., Harding, M. M., Kwong, J., & Roberts, D. (2019). Medical-surgical nursing: Assessment and management of clinical problems (11th ed.). *Elsevier*

Mosby. Solanki, S., Chakinala, R. C., Haq, K. F., Singh, J., Khan, M. A., Solanki, D., Vyas, M. J., Kichloo, A., Mansuri, U., Shah, H., Patel, A., Haq, K. S., Iqbal, U., Nabors, C., Khan, H. M. A., & Aronow, W. S. (2020). Paralytic ileus in the United States: A cross-sectional study from the national inpatient sample. *SAGE Open Medicine*, 8. https://doi.org/10.1177/2050312120962636

Stephen Lowry, Robert Dorian, Louis Alarcon, Parviz Amid, Dana Andersen, Roland Andersson, & Peter Angelos. (2015). *Schwartz's Principles of Surgery Tenth Edition*. www.ketabpezeshki.com

Wattchow, D., Heitmann, P., Smolilo, D., Spencer, N. J., Parker, D., Hibberd, T., Brookes, S. S. J., Dinning, P. G., & Costa, M. (2020). Postoperative ileus-An ongoing conundrum. Neurogastroenterology & *Motility*, 33(5). https://doi.org/10.1111/nmo.14046

Weledji, E. P. (2020). Perspectives on paralytic ileus. *Acute Medicine & Surgery,* 7(1). https://doi.org/10.1002/ams2.573

Wintery, E., Syam, A., Simadibrata, M., & Manan, C. (2003). Management of Paralytic Ileus. *The Indonesian Journal of Gastroenterology Hepatology and Digestive Endoscopy*, 80. https://media.neliti.com/media/publications/67547-EN-management-of-paralytic-ileus.