Predictive Nursing Experience of a Case of Pulmonary Tuberculosis Complicated with Jejunostomy and Ileostomy

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Abstract: This study aims to improve patients' symptoms and enhance their quality of life through comprehensive pathological and physiological analysis, combined with integrated healthcare interventions. The research involves the observation of various nursing interventions tailored to different pathological and physiological conditions. During the patients' hospitalization, meticulous nursing measures, including the management of ileostomy and jejunostomy, enteral nutrition application, compliance with tuberculosis treatment, and psychological care, led to a significant improvement in tuberculosis symptoms, radiological absorption of pulmonary lesions, and a marked enhancement of nutritional status. This study underscores the importance of comprehensive pathological and physiological analysis and the use of proactive healthcare interventions when dealing with patients suffering from various chronic illnesses. This holistic approach to healthcare has a positive impact on the prevention and control of chronic diseases such as tuberculosis and can serve as a valuable reference for similar cases, providing substantial support in improving patients' quality of life..

Keywords: Malnutrition; Proactive Healthcare; Tuberculosis; Small Bowel Resection; Quality of Life

1. Introduction

The small intestine, a vital organ in the digestive system, plays a crucial role in breaking down and absorbing nutrients from ingested food. When the length of the small intestine falls below 100cm, it inevitably gives rise to various levels of digestive and absorptive dysfunction [1]. In the presented case, the patient underwent small intestine resection, followed by jejunostomy and ileostomy procedures, resulting in a remaining small intestine length of 80cm. This reduced length has posed a significant challenge, leading to a degree of nutritional disorder in the patient.

Moreover, tuberculosis of the lung, a chronic consumptive disease, is closely linked to malnutrition. Addressing nutritional deficiencies becomes a pivotal aspect of tuberculosis prevention and control [2]. The unique aspect of this case lies in its comprehensive approach, beginning with an exploration of the patient's pathology and physiology. The collaborative efforts of medical and nursing staff were integral to devising an integrated treatment and care strategy, incorporating proactive nursing interventions [3].

Throughout the hospitalization period, the patient exhibited substantial improvement in tuberculosis symptoms. The utilization of a balloon catheter for enteral nutrition [4], coupled with diligent stoma care and targeted management of related symptoms, contributed to the positive outcome. After a 30-day hospital stay, the patient received continuous care post-discharge, resulting in a remarkable amelioration of tuberculosis symptoms and a notable reduction in lesion absorption observed on the post-discharge CT scan. Importantly, there was a significant enhancement in the patient's overall nutritional status.

This case exemplifies the success of a holistic and collaborative medical and nursing approach, showcasing the efficacy of proactive interventions in managing patients with complex medical histories. The combined efforts of the healthcare team not only addressed the challenges posed by the shortened small intestine but also played a pivotal role in improving the patient's nutritional well-being and contributing to the positive outcome in tuberculosis management.

2. Case Introduction

The patient, a 73-year-old male, had secondary tuberculosis of the lung, status post small intestine resection, jejunostomy, ileostomy, short bowel syndrome, primary thrombocythemia, liver cysts, renal cysts, and prostate hyperplasia. He presented with lung lesions for 2 days, discovered during a “stoma reversal surgery.” Sputum test for acid-fast

bacilli was positive, and he was admitted to our department with the diagnosis of “tuberculosis of the lung.” Recently, there were no significant changes in his diet, weight, or bowel movements. He has a history of hypertension for over 10 years. Splenomegaly was discovered in September 2019. On March 2, 2020, portal hypertension was identified due to "hematemesis," and a splenectomy was performed on April 3, 2020, after which a large amount of pleural effusion was found, with about 2000 milliliters of pleural fluid extracted. On April 20, 2020, he was diagnosed with "primary thrombocythemia" and treated with hydroxyurea and rivaroxaban. On June 16, 2020, he was diagnosed with "mesenteric vein thrombosis, intestinal necrosis" and underwent "intestinal resection + enterostomy," followed by multiple hospitalizations for "short bowel syndrome" at local hospitals.

3. Pathophysiology of the Patient

The patient's symptoms and clinical presentations may seem complex, but they are easier to understand from a pathological and physiological perspective, which also makes it easier to proactively identify and prevent potential issues (Figure 1).

The cause of primary thrombocythemia is unclear, possibly related to a decrease in thrombopoietin (TPO) [5], leading to an increase in platelets, which can cause hypercoagulability of the blood. Hypercoagulability is an important factor in the formation of blood clots [6]. Clinically, it can manifest as mesenteric vein thrombosis [7], with 50%-80% of patients experiencing splenomegaly [7]. Blood clot formation can block vessels, causing embolism [6].

The portal vein receives blood from the superior and inferior mesenteric veins and the splenic vein [8]. Mesenteric vein thrombosis in the patient can lead to increased portal vein blood flow resistance and blood stasis, resulting in portal hypertension [1]. In addition, mesenteric vein thrombosis can cause intestinal necrosis [9-10]. Hence, the patient underwent jejunostomy and ileostomy. Portal hypertension can lead to the opening of collateral circulation, causing splenomegaly and hypersplenism. Hypersplenism can lead to a reduction in all three blood cell lineages [5], with this case primarily exhibiting a reduction in the red and granulocytic series. The patient displayed anemia and a reduction in total white blood cell and granulocyte counts. Based on the patient's pathology and physiology, the focus of this case was on proactive nursing care for jejunostomy and ileostomy treatment, proactive nursing care for tuberculosis treatment, and proactive care for clinical symptoms caused by the patient's special pathological and physiological state.

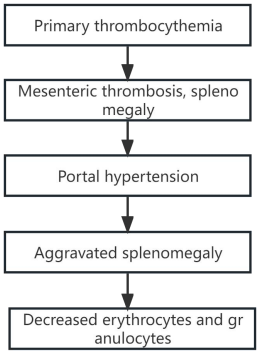

Figure 1. Pathophysiologic Structure of the Patient

4. Nursing Process

4.1 Anticipatory Care of Jejunoileal Ileus

Anticipatory care [3] refers to the nurse's comprehensive analysis of the possible risks that may arise during the treatment process before the formal implementation of the nursing operation, and predictive analysis of the possible problems that may arise during the nursing process, and the development of appropriate nursing procedures in order to avoid and reduce the occurrence of risks [11]. This is a philosophy of prevention over cure.

The postoperative jejuno-ileal status of the patient is shown in Figure 2. The food eaten through the mouth passes through the oral cavity, stomach, duodenum, and part of the jejunum to be digested and absorbed to drain the food residue out of the body.

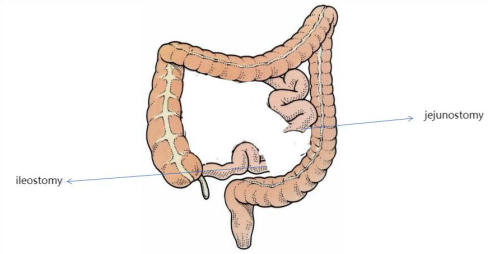

Figure 2. Postoperative Anatomical Status of the Patient's Jejunum and Ileum

The external appearance of the patient's jejunostomy is shown in Figure 3. The jejunostomy stoma serves to expel food from the body, while the ileostomy stoma is responsible for delivering food into the body. Upon admission, both the jejunum and ileum were mature stomas for this patient. Furthermore, compared to the ileostomy, care for the jejunostomy is relatively simpler.

Figure 3. External Appearance of the Patient's Jejunostomy

4.1.1 Proactive care for jejunostomy

(1) Dietary Management:

In order to prevent stoma blockage, it is crucial to carefully control the intake of high-fiber foods. Patients with jejunostomy should be advised to limit the consumption of foods that are excessively fibrous, as these can lead to complications such as blockages.Additionally, it is advisable to avoid excessively thin or gas-producing foods, as these can contribute to discomfort and may affect the functionality of the jejunostomy.

(2) Oral Care:

Performing oral care twice daily is essential to prevent fungal infections and maintain overall oral hygiene. Fungal infections can lead to complications such as diarrhea or systemic infections, making regular oral care a key component of proactive management. Routine checks of the patient's mouth for ulcers are crucial, as ulcers can be a potential source of infection and may impact the patient's overall well-being.

(3) Skin Care:

Regular attention to the skin around the stoma is necessary to prevent complications such as infections. Practicing aseptic techniques during stoma care is imperative to reduce the risk of intestinal infections.Health care providers should educate both the patient and their caregivers on proper techniques for maintaining the cleanliness of the stoma site and surrounding skin.

(4) Jejunostomy Bag Maintenance:

Changing the abdominal wall stoma bag for the jejunostomy once a day is a standard practice to ensure hygiene and prevent complications. Regular changes help in maintaining the integrity of the stoma and reduce the risk of infection or irritation.

(5) Skin Hygiene:

Cleaning the skin around the stoma twice daily is essential for preventing infection and ensuring optimal skin health. Regular checks for signs of redness, heat, or leakage of intestinal contents are critical in identifying potential issues early on. Keeping the surrounding skin dry and clean is not only important for preventing infection but also contributes to the patient's comfort and overall well-being.

Implementing these proactive care measures not only addresses immediate concerns related to jejunostomy but also contributes to the long-term success of the patient's overall health and quality of life. The collaboration between healthcare providers, patients, and caregivers is pivotal in ensuring the effective implementation of these care strategies.

4.1.2 Proactive care for ileostomy

As shown in Figure 4, since the ileostomy stoma is the channel through which food enters the body, aside from jejunostomy care points (2)-(5), additional care is required.

Figure 4. External Appearance of the Patient's Ileostomy

(1) Application and care of the balloon catheter. The use of a balloon catheter allows for pressure adjustments according to the patient's condition to avoid intestinal compression, while effectively preventing the catheter from falling out. Inflate the balloon with 5ml of sterile water for injection, adjusting the pressure according to the patient's comfort and the actual condition of the catheter, with the pressure ranging between 5-10ml of sterile water. Rinse the tube with 20-30ml of warm water before and after each injection, and avoid administering particulate medications through the tube to prevent blockage (Figure 5). Secure the urinary catheter properly to prevent pulling, twisting, and falling out.

Figure 5. Uniform Input of Nutritional Fluid

(2) Start with a low concentration and small dose of nutritional fluid, gradually increasing; administer it evenly (500-1000ml over 4 hours), and at a heated temperature (37-40℃). Observe for any gastrointestinal side effects such as abdominal pain, nausea, or vomiting.

(3) Explain to the patient the types of enteral nutrition fluids used, the infusion method, and possible complications to ensure psychological adjustment, timely management of discomfort during enteral nutrition, reducing psychological burden, and increasing a sense of security.

(4) Strictly clean and disinfect the nutritional fluid preparation materials. The nutrition fluid should be prepared and used immediately; replace materials daily. Disinfect the end of the catheter with povidone-iodine after daily infusion and cover with sterile gauze to prevent contamination. Once the nutrition fluid is opened, it should not be stored at room temperature for more than 6 hours, and generally not more than 24 hours in the refrigerator.

(5) Accurately record fluid intake and output, and according to medical orders, perform biochemical and electrolyte tests regularly. Timely address low potassium levels and other imbalances indicated by the patient's lab results.

4.2 Proactive Nursing for Tuberculosis

Nursing care for tuberculosis is integral to the successful management and recovery of patients, and a proactive approach is essential for addressing the unique challenges associated with this infectious disease. Several key points underscore the importance of proactive nursing in the care of tuberculosis patients:

4.2.1 Medication adherence

Proactive nursing begins with a strong emphasis on medication adherence. Upon admission, health education sessions are conducted for tuberculosis patients and their families to impart a comprehensive understanding of the importance of regular and full-course treatment. Nurses play a pivotal role in reinforcing the significance of adhering to the prescribed medication regimen, as consistent and timely intake is crucial for the successful cure of tuberculosis. The nursing team provides ongoing support and education, addressing any concerns or misconceptions that may arise during the course of treatment. By fostering a collaborative relationship with patients and their families, nurses contribute to improved medication adherence and, consequently, more favorable treatment outcomes.

4.2.2 Psychological care

Patients diagnosed with positive bacilli may experience feelings of shame or stigma due to the contagious nature of tuberculosis. Recognizing the psychological impact of the disease, proactive nursing care places a strong emphasis on providing psychological support.

The implementation of a specialized nursing model, such as the 1:1:3-4 nursing model, is particularly effective in addressing psychological needs. This model ensures a dedicated primary nurse, attending physician, and a team of responsible nurses for each patient, fostering a personalized and attentive approach to care. Immediate response and management of patient concerns are facilitated through this model, promoting a sense of

security and trust in the healthcare team. Proactive psychological care extends beyond the hospital setting, encouraging open communication and addressing social stigmas associated with tuberculosis. By creating a supportive environment, nursing professionals contribute to the overall well-being of patients, positively impacting their mental and emotional health.

In summary, proactive nursing for tuberculosis involves a holistic approach that goes beyond the standard routine. By prioritizing medication adherence and recognizing the psychological challenges faced by patients, nursing professionals contribute significantly to the comprehensive care and successful recovery of individuals affected by tuberculosis. The implementation of specialized nursing models further enhances the effectiveness of proactive care, ensuring that patients receive the attention and support needed throughout their journey to recovery.

4.3 Proactive Nursing for Clinical Symptoms Caused by the Patient's Special Pathophysiological State

4.3.1 Reduction in red and granulocytic series

Given the patient's unique physiological status, proactive nursing involves close communication with the medical team when signs of anemia and a decrease in white and granulocyte cells are observed. It is essential to collaborate with doctors to anticipate and address potential issues promptly. Avoiding medications such as lenalidomide, which can impair bone marrow hematopoietic function, is a crucial proactive measure. By steering clear of drugs that may exacerbate the reduction in red and granulocytic series, the nursing team contributes to maintaining the patient's hematological balance.

4.3.2 Dietary management

Proactive nursing extends to dietary recommendations, emphasizing the importance of a balanced diet for the patient. Advise the patient to increase the intake of iron-rich foods, including animal offal, whole blood, lean meat, black fungus, and spinach. These dietary adjustments align with medical advice and can play a significant role in supporting the patient's nutritional needs. Following medical guidance for the use of specific medications becomes crucial after the occurrence of reduced red blood cells and white blood cells. Proactive nursing involves ensuring the patient's compliance with prescribed medications to address hematological concerns effectively.

4.3.3 Symptom management for anemia

For patients experiencing anemia, proactive nursing interventions focus on symptom management. Encourage adequate rest, emphasizing its role in supporting the body's recovery. Oxygenation measures, such as promoting deep breathing exercises, can further contribute to alleviating symptoms associated with reduced red blood cells. Dietary recommendations also play a role in symptom management for anemia, with the nursing team encouraging the patient to adhere to a diet rich in nutrients that support hematopoiesis.

4.3.4 Reduced white blood cells and granulocytes

In cases where patients exhibit reduced white blood cells and granulocytes, proactive nursing strategies include minimizing the patient's exposure to crowded environments. This precautionary measure aims to reduce the risk of infection, considering the compromised immune function. Recommending the use of masks as a preventive measure aligns with infection control practices and adds an additional layer of protection for the patient. Proactive nursing ensures that the patient is well-informed about these measures and follows them diligently.

In summary, proactive nursing for clinical symptoms caused by the patient's special pathophysiological state involves a multifaceted approach. By anticipating potential complications, collaborating with the medical team, and implementing targeted interventions, nurses contribute significantly to the overall well-being and management of patients with complex physiological conditions. The emphasis on communication, patient education, and preventive measures underscores the proactive nature of nursing care in optimizing patient outcomes.

5. Conclusions

In conclusion, the comprehensive nursing approach, with a particular emphasis on proactive nursing measures, has demonstrated a positive and transformative impact on the management of complex cases involving post-small intestine resection, jejunostomy,

ileostomy, and concurrent tuberculosis. This study not only highlights the significance of integrated pathological and physiological analysis in handling intricate medical scenarios but also sheds light on specific guidance for proactive nursing care, contributing to enhanced patient outcomes.

Firstly, the emphasis on integrated pathological and physiological analysis is crucial in managing complex cases. By delving deeply into the patient's pathophysiological state, the medical team gains valuable insights that enable them to anticipate potential issues and proactively address complications. This approach not only enhances the understanding of the patient's health issues but also forms the basis for the development of a tailored and effective nursing plan. The comprehensive analysis facilitates a proactive stance, allowing the medical team to intervene early and mitigate risks, ultimately improving patient outcomes.

Secondly, the study provides specific and practical guidance for proactive nursing care related to jejunostomy and ileostomy. For jejunostomy, the focus on maintaining stoma patency, preventing blockage, and infection is crucial for the overall well-being of the patient. Simultaneously, for ileostomy, the attention extends beyond stoma care to encompass the application and management of enteral nutrition. The effective implementation of these nursing measures plays a pivotal role in maintaining intestinal function and significantly improving the patient's quality of life. This underscores the importance of a meticulous and tailored nursing approach to meet the unique needs of patients with complex gastrointestinal conditions.

Furthermore, the study explores proactive nursing interventions for tuberculosis, emphasizing the dual aspects of treatment adherence and psychological care. Tuberculosis patients often face societal stigma due to the infectious nature of the disease, making psychological support an integral component of care. Through the implementation of the primary nursing model, the medical team can better address the holistic needs of tuberculosis patients, increasing satisfaction and adherence to treatment plans. This holistic approach not only supports the patients emotionally but also contributes to a more successful treatment outcome, ultimately leading to the cure of tuberculosis.

In summary, the integration of a comprehensive nursing approach, especially with a focus on proactive measures, not only addresses the intricacies of complex medical cases but also enhances patient well-being, satisfaction, and treatment outcomes. The findings of this study provide valuable insights for healthcare professionals, emphasizing the importance of a patient-centered and proactive approach in managing multifaceted medical conditions.

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