

Research Progress In The Application Of Bundles Of Care To Post-Chemotherapy Infection In Leukemia Patients

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ABSTRACT

Leukemia patients have a high incidence of infection and high mortality after chemotherapy, and bundles of care can provide patients with the best possible medical care services. This paper reviews the application in tube infection, multi-drug-resistant bacterial infection and pulmonary infection, draws on mature foreign bundles of nursing concepts, and explores bundles of nursing strategies suitable for China, including organizing bundles of nursing groups, retrieving effective information, Construct a scientific bundles of nursing plan, set evaluation indicators, etc. to reduce the occurrence of infection in leukemia patients after chemotherapy.

KEYWORDS

Bundles of care; Leukemia; Chemotherapy; Infection

Leukemia is a common hematologic disease, and multiple courses of high-dose chemotherapy is its main treatment plan ^[1-2], due to the bone marrow suppression caused by chemotherapy, the abuse of antibiotics and the immune dysfunction caused by the disease itself, the ability of leukemia patients to resist pathogenic microorganisms is greatly reduced, and they are prone to concurrent infections in the course of the treatments they receive, and the risk of hospital-acquired infections for patients with acute leukemia ranges from 51.0% to 67.5%, and the infection rate of patients with granulocyte deficiency caused by chemotherapy can reach 58.6% to 85.2% ^[3], and infection is the most common complication after chemotherapy, and also the main cause of death ^[4-5]. Due to autoimmune deficiency in leukemia patients, infections often involve multiple systems, commonly the respiratory system, urinary system, gastrointestinal tract, skin, and soft tissues ^[6]. Bundles of care, which is the collection of a series of evidence-based nursing measures ^[7-8] to provide quality care to patients without interruption, not only optimizes routine care, but also focuses more on the effectiveness of the measures. Judging from the incidence of post-chemotherapy infections, the prevention and control of infections is still a long way to go, and the adoption of scientific and effective nursing measures has a significant role in patients' confidence in treatment as well as in reducing the rate of infection ^[9].

1 Bundles of care in oral infections

Oral infection is a common complication after chemotherapy in leukemia patients, and after infection, patients may suffer from perioral pain, dysphagia, ulceration, and inadequate nutritional intake ^[10]. The main measures of adopting bundles care include: setting up an intensive care team; strictly disinfecting the laminar flow ward before patients are admitted to the warehouse, fumigating the ward for half an hour with 500 mg/L chlorine disinfectant, and sealing it for 2 hours before making up the beds for the patients; Medical personnel wear latex gloves, and strictly carry out hand hygiene and cleaning and disinfection before entering the warehouse; patients' drinking water must be heated to 100 °C twice in a row, and the lunch box should be disinfected three times and microwave sterilized for each meal; according to the patient's absolute value of neutrophils and the patient's condition, corresponding gargling methods are adopted; if the absolute value of neutrophils is $<2 \times 10^9/L$, then 0.12%-0.2% chlorhexidine gargling is used. Chlorhexidine gargle, if the absolute neutrophil $<0.5 \times 10^9/L$, use 0.9% sodium chloride plus recombinant human granulocyte stimulating factor gargle, and check the oral pH value 30 minutes after gargling, the results can effectively reduce the occurrence and deterioration of oral mucositis in leukemia patients after chemotherapy ^[11]. In addition, through the formation of a bundles of care team, members of which must undergo training related to bundles of care, present the problem to be solved by the care intervention. A search was conducted to establish clinical evidence-based nursing interventions, centralized education sessions for patients, oral care in the morning and evening, psychosocial care, daily honey rinses for prophylaxis, and scientific dietary care. Through bundles of care, not only can reduce the occurrence of stomatitis, but also improve the sleep and spirit of patients, and improve the patients' satisfaction with nursing ^[12].

He Xiaohong et al ^[13] also proposed in the bundled oral care, in the use of oral assessment guidelines based on the introduction of oral ulcer ruler to carry out grading, shift handover by two nurses to jointly assess and registered in the department's own "patient chemotherapy observation record sheet" in the corresponding items, the department of health care according to the oral PH value as well as the grade of oral mucositis to develop a gargling program, and to

guide the patient to carry out the appropriate amount of open-mouth breathing movement. The training is to open the mouth and breathe for 10 seconds and then close the mouth for 30 times, which can inhibit the growth of anaerobic bacteria to a certain extent, and the results show that intensive nursing care is beneficial to prevent the occurrence of oral mucositis.

2 Application of bundles of care in PICC catheterization infection

PICC (central venous cannulation via peripheral vein puncture) can avoid the pain caused by repeated puncture and extravasation of chemotherapeutic drugs to patients^[14], but it is prone to lead to complications such as phlebitis, bloodstream infections, and bacterial infections^[15]. The use of bundled care model for leukemia patients treated with PICC before and after catheterization can reduce the occurrence of related complications and improve catheter utilization^[16-17].

2.1 Pre-intubation application

By assessing the risk of patients before cannulation, the specific items include the assessment of deep vein thrombosis and infection, etc., and according to the assessment results, symptomatic management, strict implementation of cannulation specifications, cannulation under real-time ultrasound monitoring under routine nursing care, hand hygiene and aseptic operation according to the standard of the procedure. Operators should enter the catheterization room after disinfecting their surgical hands, formulate reasonable catheter maintenance standards, and conduct full psychological intervention through good communication during the catheterization process. These bundled nursing measures can effectively improve the success rate of one-time catheterization and reduce the risk of vascular complications. The occurrence of injury and infection^[18]. In addition, Guo Li et al.^[19] reduced the risk of infection before catheterization through training and assessment to determine the personnel of the cluster nursing team, establish a maximum sterile barrier for standardized catheter placement, and ultrasound-guided catheterization.

2.2 Post-intubation application

Search for evidence-based basis around "reducing complications and the occurrence of unplanned extubation" and implement the nursing plan. For example, nursing care for phlebitis includes selecting an appropriate catheter according to the patient's body type before catheter insertion, improving puncture technology, selecting appropriate blood vessels, Avoid repeated hard penetration; Care for catheter-related vascular infections includes raising awareness of hand hygiene, disinfection, cleaning and isolation management, dedicated catheter maintenance after catheter placement, strengthening catheter monitoring, etc.; care for dermatitis includes timely replacement of dressings, if curling occurs. If there are any problems, it should be replaced immediately, chlorhexidine disinfectant should be used to disinfect the puncture point, and transparent application should be used to fix it after it dries. The use of bundles of care can improve the professional skills and sense of cooperation of nursing staff, and at the same time achieve the effective maintenance of PICC and reduce the occurrence of infection^[20]. The incidence of phlebitis after PICC placement reached 50%^[21], and the occurrence of phlebitis was reduced by adopting a bundled nursing program, analyzing and evaluating the causes of phlebitis, formulating appropriate treatments based on individual patient differences, vessel selection, and drug irritation, as well as providing patients with health education and taking preventive measures^[22]. It has been shown^[23] that the incidence of infection after PICC placement is significantly higher in children with leukemia than in adults due to age and development. The use of bundled nursing measures for children with leukemia, through evidence-based search to build a set of scientific nursing program, strengthen the training of nursing staff, specific measures mainly include mastering the key points of local skin disinfection, post-catheterization maintenance skills and hand hygiene, do a good job of cleaning and disinfection work, including the air as well as the disinfection of the use of equipment and materials, targeting the maintenance of catheters, the children should be diligent observation, monitoring work, implementation of these measures can effectively reduce the incidence of post-catheterization infections in children with leukemia^[24].

3 Bundles of care in perianal infections

Leukemia chemotherapy patients are highly susceptible to perianal infections during the period of myelosuppression^[25-26], especially in the elderly and frail or pediatric leukemia patients, and after the occurrence of perianal infections, the patients often suffer from pain and discomfort in the perianal area, changes in defecation habits, and impacts on the patient's sleep and spirit. On the basis of routine care, the search platform was used to determine a specific bundling program: cleaning and disinfecting the wards, disinfecting the air with ultraviolet rays twice in the

morning and twice in the evening, scrubbing the wards with chlorine-containing disinfectants, and isolating controllable infectious factors in all directions; Infection control, keeping patients' skin clean and dry, strictly following nursing norms and hand hygiene procedures; emphasizing the importance of perianal and perineal care, cleaning the anus and surrounding skin with soft wipes and warm water before bedtime and after defecation, using different medicated sitz baths, and applying ointment after cleaning. In comparison, bundles of care strategy was found to be clinically effective in reducing the incidence of perianal infections during chemotherapy^[27].

4 Bundles of care in the control of multidrug-resistant bacterial infections

With the widespread use of antimicrobial drugs, the incidence of multi-drug resistance is increasing in the clinic, and chemotherapy is a risk factor for leukemia patients to develop infections with multi-drug-resistant bacteria^[28], applying bundles of care to prevent infections with multi-drug-resistant bacteria: establishment of a bundles of care team; Standardized treatment of the environment, families, health care workers and patients, regular microbiological testing of wards, prohibit visits, separate wards for confirmed or suspected patients with special marking, health care workers need to enter and exit to establish the maximum sterile barrier; prevention of cross-infection, the patient's beds, clothing and use of equipment is the main source of infection, should be arranged for the disinfection of the person in charge of the ward, and to avoid the introduction of medical documents into the wards; the rational application of antibiotics. The use of antibiotics should be rationalized. The results showed a significant reduction in the incidence of infections with multidrug-resistant bacteria^[29]. Qiu Xiaomei et al^[30] in the prevention and control of multidrug-resistant bacterial infections in children include the establishment of bundles of care groups and training to learn bundles of care strategies and risk factors for multidrug-resistant bacterial infections, Searching for and constructing appropriate intervention programs; strengthening disinfection and isolation, giving single room or homologous isolation in case of multi-drug resistant bacteria infection, and disinfecting sick rooms, wards.

5 Bundles of care in the control of respiratory infections

Respiratory tract infection is a common complication after chemotherapy in patients with leukemia, and the rate of lower respiratory tract infection in patients with acute myeloid leukemia during the induction and remission period can reach 70% to 85%^[31]. In the bundles of care for controlling respiratory infections, the main measures include: implementing categorical isolation of patients in the ward according to the presence or absence of neutrophil deficiency; Strict management of accompanying nurses, strictly prohibit the visitation of patients in protective isolation, the visitation time of other patients is not more than 30 minutes, strictly prohibit the visitation of people with symptoms of respiratory and digestive tract infections; keep the environment clean and disinfected, according to the infection status is divided into hygienic level ward and disinfectant level ward, and all the nurses are involved in cleaning and disinfecting work in the department; standardize the management duties of healthcare personnel and hand hygiene, effectively cut off the exogenous infection occurrence, reducing the incidence of infection in the respiratory system^[32].

6 Conclusion

In summary, bundles of care provides excellent guidance for caregivers, improves the quality of life of patients with leukemia, reduces complications, increases cooperation between health care providers, and continually improves the professionalism of caregivers. At present, there are still some deficiencies in China's application of bundles of care in the prevention and management of infections in leukemia patients after chemotherapy: first, the overall attention is not enough, the quality of the research articles is not high, and they are mainly focused on the study of common types of infections, and the number of studies on infections with a lower incidence rate is less; Secondly, bundles of care must strictly implement every step in the program, and the lack of supervision and evaluation indexes in the implementation process cannot guarantee the effective implementation of the measures. Therefore, future research can broaden the scope of application, organize bundles of care groups, construct scientific bundles of care programs, strengthen supervision and set evaluation indicators, so as to continuously improve the quality of life of leukemia patients.

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