ABSTRACT

Objective: to describe nursing interventions in a case of vincristine extravasation, by peripheral intravenous catheters in children with cancer, with emphasis on the use of hyaluronidase. Method: descriptive study, medical case type, developed from the patients’ chemotherapy services at a private Oncological Clinic, in the northeastern of Brazil. The Research Ethics Committee of the institution, protocol n° 560.065, approved this study. Results: use of hyaluronidase is indicated as help to the extravasation of vincristine. Its use in children and effective nursing care, favored controlling the signs and symptoms of extravasation, promoted comfort and pain relief for the patient and reducing the level of toxicity and enabling the continuity of the anticancer treatment. Conclusion: the extravasation of antineoplastic chemotherapy medicine is considered emergency by risk of permanent damage. Even with prevention strategies, it is still a challenge for nurses who need to act based on the best available evidence. Descritores: Extravasation; Venticamr Chemotherapy; Nursing Care.

RESUMEN

Objetivo: describir intervenciones de enfermería diante de un caso de extravasación de vincristina, por catéter intravenoso periférico, en niños con cáncer, con énfase en el uso de hialuronidasa. Método: estudio descriptivo, del tipo caso clínico, desarrollado con paciente proveniente del Setor de Quimioterapia de un Ambulatório Oncológico privado, en la región Nordeste del Brasil. Este estudio fue aprobado por el Comité de Ética en Pesquisa da Instituição, protocolo n° 560.065. Resultados: el uso de hialuronidasa es indicado como subsidio para el extravasamiento de vincristina. Su utilización en la ninas, com como a efectiva asistencia de enfermería, favoreció el control de los sinas e sintomas del extravasamento, promovio conforto y alivio da dor para el paciente e reduziu o grau de toxicidade, e posibilitou a continuidade do tratamento antineoplásico. Conclusão: o extravasamento de quimioterápicos antineoplásicos é considerado emergência pelo risco de danos permanentes. Mesmo com estratégias de prevenção, permanece sendo um desafio para os enfermeiros que precisam atuar com base nas melhores evidências disponíveis. Descritores: Extravasamento; Quimioterapia Vesticante; Cuidados de Enfermagem.
Chemotherapy is highlighted in the management of tumors and transformed the prognosis of many hematologic malignancies and solid tumors. Unfortunately, most antineoplastic agents may cause dermatological local and systemic toxicity. Its sequel increases morbidity, prolonging hospital stay and requiring a temporary stop treatment. Its harm potential is great, with prevention as the biggest weapon.¹

The vincristine sulfate is a chemotherapeutic made from the leaves of the plant Vinca Rósea (Catharanthus roseus) (Figure 1).² Its use is valid in diseases such as lymphoma, leukemia and kidney nephroblastoma.³

In Human Medicine, vincristine is the most used and more effective in pediatric oncology than in adults with cancer. The tumors of children appear to have a greater level of sensitivity to the medication causing the infant tolerance to high doses of vincristine better than in older people.⁴ Selection of appropriate pharmacological protocol for each patient is critical to the success of anti-tumor treatment.⁵

The members of the vinca alkaloid category are called mitotic inhibitors, since they are medicine of specific cell cycle acting only on mitosis cells (M phase)⁶, promoting rupture mitotic zone.⁶ By preventing the metaphase, vincristine prevents the correct segregation of chromosomes during mitosis, leading to cellular death.² After application, the cytostatic has rapid distribution in the body, especially in rich fabrics tubulin (which promotes disruption of microtubules), leukocytes and platelets.

According to the Oncology Nurse Society, when the medicine escapes from the blood vessel to the surrounding tissues, it is called as extravasation.⁷ As a vesicant drug, vincristine causes severe irritation with blistering and tissue destruction when infiltrated outside blood vessel.⁸

Its local toxic effects vary and may cause pain, tissue necrosis or tissue peeling. Morbidity depends on the drug, the extravasated amount and its concentration, the extravasation location, the patient’s condition and the interval between the fact and its recognition and treatment.⁸ The most serious and lush skin reactions are due to extravasation of vesicant drugs in neighboring woven punctured vein.⁸

The local toxicity occurs in the surrounding tissues to the drug application area. This group may include some changes: phlebitis, rash, pain, erythema, venous discoloration and tissue necrosis secondary to extravasation.⁸

The extravasation of anticancer medication is 0.5% to 6% of the total management of all cytotoxic medicine administered by peripheral route in adults and 0.3% to 4.7% in catheters completely implemented.⁹ One in nine children and one in every hundred adults have extravasation while receiving doxorubicin or vincristine, both vesicant drugs.¹⁰

The first study described in the literature on extravasation of cancer chemotherapy occurred in 1971 involving doxorubicin. Wang et al¹¹ pointed vomiting, mucositis, alopecia, “chemical cellulite”, leucopenia, thrombocytopenia, anemia, and cardiac toxicity as complications caused by this chemotherapy.

Risk factors for extravasation of chemotherapy drugs in applications for peripheral venous access may be related to the use of small and fragile veins; technical venipuncture error; inappropriate venipuncture place; prior chemotherapy in the same vessel, axillary lymphadenectomy; prior radiotherapy in puncture area; technical error in administration; presence of the superior cava syndrome; preexisting vascular disease; nutritional changes; peripheral neuropathy and concurrent use of medications that can cause drowsiness, confusion, mental confusion, vomiting or coughing.¹²

The first signs and symptoms may happen immediately or a few days or weeks after application. Immediate reactions are:
burning, swelling, local discomfort and erythema. The extravasation of vesicants drugs, particularly those capable of binding to DNA cellular causes late changes, such as pain, burning, edema, induration, ulceration, blistering, necrosis, cellulite and inflammation.  

**OBJECTIVE**

To describe nursing interventions in a case of vincristine extravasation by peripheral intravenous catheters in children with cancer, with emphasis on the use of hyaluronidase.

**METHOD**

Descriptive study with a qualitative approach, with breadth and depth case study, with an intensive analysis of a specific situation, which enables a more complete understanding of the phenomenon under study, emphasizing its various dimensions and its context. Therefore, it is seen as the most appropriate design for investigating a phenomenon within its real context.

The same author emphasizes that the case study is an empirical investigation and comprises a comprehensive method, with the logic of the planning, collection and analysis of data. It may include single and multi-cases studies as well as quantitative and qualitative research approaches.

To present this study, the proposed of Gil will be followed when emphasizes that the case study does not accept a hard script to its delimitation, but it is possible to define four phases of its design: 1) delimitation of the case; 2) data collection; 3) selection, analysis and interpretation of data; 4) preparation of the report.

A case of child diagnosed with acute lymphoblastic leukemia who underwent treatment with chemotherapy, showing extravasation of vincristine during intravenous administration, and treated with hyaluronidase will be reported. The data relating to treatment were extracted from the electronic and physical records of the patient, in addition to qualitative assessments, paying attention to the variables related to the nursing care and the level of skin toxicity in vincristine extravasation.

After submission and approval of the project by the Ethics Committee in Research with Human Beings, under protocol 560,065, data collection was conducted and it was found that the method did not require changes, ensuring confidentiality and anonymity before and after signing with acceptance the Consent Form.

There was acceptance of the patients’ parents regarding treatment protocol proposed by the team as well as their approval by signing the Consent Form (TCLE) for photographic documentation and subsequent dissemination of the case in the institution.

Data analysis was performed using the method of Reflection-Synthesis analysis, which assumes the contents of motion analysis and synthesis mediated sensitivity and reason.

**RESULT**

Clinical case study

Child, male, 2 years old, BMI 20.6, OS 0, acute lymphoblastic leukemia with standard risk being treated with chemotherapy and protocol proposed by the Brazilian Group Leukemia Treatment of Childhood (GBTLI) - LLA/99. Parents denied based diseases and drug allergies. The child has as result of initial laboratory testing, 20,800 white blood cells per m³, parents reported progression of a skin injury for about six months, which began with intense pain symptoms for about four days. In the initial clinical examination, the patient showed pain at the affected site, abdominal region and reddened skin surface.

Started treatment as proposed general plan of Figure 2.
Risk factor (RF) is based on the number of blasts in the peripheral blood at diagnosis and spleen and liver size, as the European BFM Group protocols, prior to BFM95 Protocol.

During Protocol I (Figure 3), the D8 during vincristine sulfate infusion after administration of 8 ml of the solution containing chemotherapy, children had edema and reported pain at the puncture site in the anterior aspect of the right forearm, approximately 6 cm from the puncture site. Being the extravasation of vincristine immediately diagnosed by clinical nurse care, infusion was interrupted, intra dermal hyaluronidase for 3 days with symptom improvement, and parents were instructed to perform warm compress four times a day and topical hyaluronidase. Daily monitoring of possible complications for seven consecutive days was carried out, being photographed as figures 6, 7 and 8. The injury and pain complaints soon reduced in the first days with the treatment, showing no worse complications.
After interventions and nursing behaviors, peripheral venous puncture was performed on the anterior surface of the opposite side and administered treatment with vincristine prescribed by a medical assistant, without other complications.

**DISCUSSION**

The LLA is a disease of hematopoietic stem cells characterized by increased numbers of lymphoid cells in the bone marrow. It affects adults and children, but at a higher incidence in the age group of two to five years old. It is one of the most challenging conditions to treat in adults, but in children, the cure rates above 80% currently described in literature.

There is no current data on the incidence of ALL in Brazil, the United States has an estimated annual incidence of 4000 new cases and 2/3 in children. It is the most common cancer in children, with a peak incidence between 2 and 5 years old, further increase after 50 years old and slightly higher incidence in white people. This data corroborate with the patient in this study, 2 years old, white.

The ALL is more common in urban areas, allowing speculations about the importance of socioeconomic factors in the etiology. The significance of the occupation of parents, exposure to alcohol, tobacco, pesticides or electromagnetic radiation is still controversial, despite the constant preoccupation with the interaction of genetic and environmental factors.

Patients usually show constitutional symptoms to diagnosis such as fever, night sweats, weight loss, skin-mucosal bleeding and infection. They may also have enlarged lymph nodes and bone pain.

After confirming the diagnosis, treatment protocol selection and guidelines for nursing consultation, the administration of antineoplastic agents administration is restricted to nurses and nursing technicians, as regulated by the Federal Council of Nursing, fact reinforced in this study. However, according to the Oncology Nursing Society (ONS), the antineoplastic administration should be carried out by oncolist nurses, thus ensuring high standards of quality which is far beyond the reality of oncology services of Brazilian cities.

Chemotherapy treatment can cause local and systemic dermatological toxicity. The toxic effects range from a fast discomfort in the drug application area to pictures of severe tissue necrosis, irreversible impairment of the nerves and tendons. The incidence of extravasation of vesicants drugs is probably underreported. Some factors increase the risk of extravasation in peripheral applications, such as: the use of small and fragile veins, technical error in venipuncture, place of inappropriate venipuncture, prior chemotherapy in the same vessel, axillary lymphadenectomy, prior radiotherapy punch area, technical error in administration, preexisting vascular disease, nutritional changes, peripheral neuropathy and concurrent use of medications that can cause drowsiness, confusion, mental confusion, vomiting or coughing.

Nurses should establish and ensure compliance of protocols with hard punch and administration avoid extravasation, especially in vesicant drugs. Once detected extravasation, as in this study, the action should be fast and efficient, treated with a consistent protocol defined by the institution. Numerous behaviors are suggested when extravasation occurs, however there is no consensus on the establishment of an effective treatment, based on physical and chemical properties of different groups of agents, or situations in which the extravasation of vesicant antineoplastic progress for a tissue necrosis. However, some steps are indisputable as to immediately infusion and keep the needle in place, vacuum residual medication and, if possible extravasated into the tissues, removing the needle and raise the limb above the heart level, apply hot compresses, in the case of vincristine for 15 to 20 minutes four times a day, photograph, document and monitor.
Recommendations for the use of antidotes are empirical, often based on animal experiments, or manufacturers’ recommendations. For this study, the hyaluronic acid was used, which has the function of accelerating the diffusion of the drug, increasing the cellular permeability, generating success in the treatment of extravasation without further tissue and psychological damage.

CONCLUSION

The antineoplastic extravasation is a constant concern in the clinical practice of nurses working in oncology therapy services, but the publications on the subject in Portuguese are still incipient.

This professional practice must take place by a process of evaluation and application of scientific evidence to better therapeutic practice. It is a care guided by results already published supporting for decision-making.

The case study was the method employed in this work to explore the evidence for effective interventions in the management of extravasation of vincristine in child patient in peripheral veins. It enables grouping and extracting knowledge in favor of a more assertive behavior. However, to implement interventions that minimize the morbidity caused by extravasation of chemotherapy, there is still need to develop future research to bring the strongest evidence for intervention.

Preventing extravasation is one of the responsibilities of nursing staff working in chemotherapy. Thus, it is necessary to acquire sufficient knowledge to promote patient safety. Therefore, it is important an improvement in service and the development of a clinical guideline in order that professionals identify patients at higher risk of extravasation, promoting prevention and minimization of harm related to the administration of vincristine.

REFERENCES


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