

Acute Kidney Injury due to Tumor Lysis Syndrome in the Intensive Care Unit - Nurses Knowledge

Lesão Renal Aguda por Síndrome da Lise Tumoral em Unidade de Terapia Intensiva- Conhecimento do Enfermeiro

Lesión renal aguda por síndrome de lisis tumoral en la Unidad de Cuidados Intensivos - Conocimiento de las enfermeras

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REVISA

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RESUMO

Objetivo: analisar a produção científica sobre a lesão renal aguda causada pela síndrome da Lise tumoral no paciente internado em unidade de terapia intensiva, bem como o conhecimento do enfermeiro sobre tal patologia. **Método:** Trata-se de um artigo de revisão integrativa realizado através da leitura de 30 artigos científicos retirados da Biblioteca Virtual de Saúde. **Resultados:** Identificou-se a ocorrência da lesão renal aguda e síndrome de lise tumoral através das alterações metabólicas e hemodinâmicas nos pacientes internados na unidade de terapia intensiva e observou-se que não há publicações com relatos do enfermeiro sobre o conhecimento desta patologia. **Conclusão:** Apesar dos estudos atuais e a busca constante pelo conhecimento, sabe-se que a lesão renal aguda e Síndrome de Lise Tumoral é uma emergência oncológica com alta taxa de morbidade, onde a principal estratégia para melhorar a evolução de pacientes é estabelecer medidas profiláticas e o tratamento adequado com urgência. Deve existir uma análise contínua do enfermeiro, bem como de toda equipe, estratificação dos riscos e elaboração de protocolos de controles hidroeletrólíticos e laboratoriais para estabilização hemodinâmica do paciente oncológico na unidade de terapia intensiva.

Descritores: Lesão Renal Aguda; Unidade de Terapia Intensiva; Síndrome da Lise tumoral.

ABSTRACT

Objective: to analyze the scientific production on acute kidney injury caused by tumor lysis syndrome in patients admitted to the intensive care unit, as well as the nurses' knowledge about such pathology. **Method:** This is an integrative review article carried out by reading 30 scientific articles taken from the Virtual Health Library. **Results:** The occurrence of acute kidney injury and tumor lysis syndrome was identified through metabolic and hemodynamic changes in patients admitted to the intensive care unit and it was observed that there are no publications with nurses' reports on the knowledge of this pathology. **Conclusion:** Despite current studies and the constant search for knowledge, it is known that acute kidney injury and Tumor Lysis Syndrome is an oncological emergency with a high morbidity rate, where the main strategy to improve the evolution of patients is to establish prophylactic measures and appropriate urgent treatment. There must be a continuous analysis of the nurse, as well as the entire team, risk stratification and elaboration of hydroelectrolytic and laboratory control protocols for hemodynamic stabilization of the cancer patient in the intensive care unit.

Descriptors: Acute Kidney Injury; Intensive care unit; Tumor Lysis Syndrome.

RESUMEN

Objetivo: analizar la producción científica sobre la lesión renal aguda por síndrome de lisis tumoral en pacientes ingresados en la unidad de cuidados intensivos, así como el conocimiento de los enfermeros sobre dicha patología. **Método:** Se trata de un artículo de revisión integradora realizada mediante la lectura de 30 artículos científicos extraídos de la Biblioteca Virtual en Salud. **Resultados:** Se identificó la ocurrencia de daño renal agudo y síndrome de lisis tumoral a través de cambios metabólicos y hemodinámicos en pacientes ingresó en la unidad de cuidados intensivos y se observó que no existen publicaciones con informes de enfermeras sobre el conocimiento de esta patología. **Conclusión:** a pesar de los estudios actuales y la búsqueda constante de conocimiento, se sabe que la lesión renal aguda y el síndrome de lisis tumoral es una emergencia oncológica con una alta morbilidad, donde la principal estrategia para mejorar la evolución de los pacientes es establecer medidas profiláticas y tratamiento urgente apropiado. Se debe realizar un análisis continuo de la enfermera, así como de todo el equipo, estratificación de riesgo y elaboración de protocolos de control hidroelectrolítico y de laboratorio para la estabilización hemodinámica del paciente oncológico en la unidad de cuidados intensivos.

Descriptores: Lesión renal aguda; Unidad de terapia intensiva; Síndrome de lisis tumoral

Introduction

The occurrence of renal function and tumors are closely correlated. It should be considered in two different situations: kidney disease caused by the presence of cancer and / or its treatment, particularly nephrotoxicity of antineoplastic drugs and kidney disease as an additional risk factor for morbidity and mortality in the course of the neoplasia. Several data suggest a role for chronic renal failure (CRF) as a risk factor independently for the development of cancer, with high incidence rates. Acute renal failure (ARF) is the most frequent renal complication induced by chemotherapy, which occurs in 12 to 49% of patients with terminal cancer. Although pre-existing renal failure can influence the outcome, it is estimated that 9 to 32% of cancer patients need hemodialysis, showing a high mortality rate (72 to 85%).¹⁻¹¹

The prediction of future health conditions in these patients is crucial, and doctors try to predict changes in their clinical conditions as early as possible, with the aim of adjusting the results, correcting in the event of early organ failure and avoiding unfavorable results. Acute kidney injury (AKI) is one of the most common organ failures in treated and affected patients about 40% of ICU admissions.⁷

Among hospitalized patients, AKI is a common complication, among cancer patients, the incidence reaches 12% of cases and often, AKI develops within the first 48 hours of admission. A Danish study of 37,257 cancer patients showed a 17.5% incidence of AKI, according to the definitions of the Rife classification (Risk, Injury, Failure, Loss of kidney function and end-stage kidney disease). In an intensive care environment in oncology hospitals, the incidence increases to approximately 50%, with the epidemiological transition of the last decades, cancer has become the subject of several clinical studies that have resulted in more options for the diagnosis and treatment of the disease. Thus, there was an increase in patient survival and the management of disease complications and adverse treatment effects also became more common.⁸

Critical patients need specific support to preserve the functions of their vital organs, which is why they are treated in intensive care units (ICU). The prediction of the future health conditions of these patients is crucial, and doctors try to predict changes in their clinical conditions as soon as possible, in order to adjust treatments, influence the eventual organ failure at an early stage and avoid unfavorable results. Nursing care for patients with AKI is a constant challenge in clinical practice, as it requires reasoning and clinical judgment in decision making. For nurses to provide assistance with quality and safety, professional interest and an incentive from the institution to achieve knowledge is necessary. It appears that the incessant search for learning is based on internal and external motivations and the effort to acquire new essential skills in the care process.^{9,12}

The tumor lysis syndrome is a complication of chemotherapy for hematological neoplasms, in particular, aggressive leukemias and lymphomas. For hematological cancers, therapies targeted as small molecule inhibitors and monoclonal antibodies, have high antitumor activity, are well tolerated and have a low incidence of associated tumor lysis syndrome.¹¹

Acute tumor lysis syndrome arises from a sudden release of intracellular products from a massive breakdown of tumor cells in the spontaneous blood circulation or secondary to radiation or chemotherapy. This complication is

characterized by tumor lysis syndrome, it is an oncometabolic emergency resulting from rapid cell death. The tumor lysis syndrome can occur as a consequence of tumor-directed therapy or spontaneously. Doctors should stratify all hospitalized cancer patients and especially those receiving chemotherapy for the risk of tumor lysis syndrome. Various aspects of prevention include adequate hydration, use of therapies to lower uric acid, use of phosphate binders and minimization of potassium intake. High-risk patient for the development of tumor lysis syndrome should be monitored in the intensive care unit.^{11,13-18}

In view of the researched and explained context, the guiding questions of this study are: what is the scientific production related to acute kidney injury caused by tumor lysis syndrome in the patient admitted to the intensive care unit? What is the nurse's knowledge about such pathology?

In this sense, the objective of this study was to analyze the scientific production on acute kidney injury caused by the tumor lysis syndrome in the patient hospitalized in an intensive care unit, as well as the nurses' knowledge about such pathology.

Method

This is an integrative review of publications related to acute kidney injury and tumor lysis syndrome in patients with neoplasms with a higher hematological incidence, also including published reports by the professional nurse in the intensive care unit.¹³

For the elaboration of the integrative review, six different steps were taken: the identification of the theme and the guiding question; establishment of criteria for inclusion and exclusion of studies / sampling; definition of information to be extracted from selected studies / categorization of studies; evaluation of included studies; interpretation of results and presentation of the review / synthesis of knowledge.¹³

To search for scientific articles relevant to the study, bibliographic searches were carried out on the Virtual Health Library (VHL) Portal, on the databases of Latin American Health Sciences (Lilacs) and Scientific Electronic Library OnLINE (SciELO).

The descriptors used in the study were: Acute kidney injury, Intensive Care Unit, Tumor Lysis Syndrome. The cause of the tumor lysis syndrome has been evidenced in recent publications, as well as the epidemiology and physiology of the disease, the main cancer patients affected by the disease undergoing chemotherapy during hospitalization in the intensive care unit.¹³

Results and Discussion

Thirty articles from 2008 to 2020 were found in relation to the relevant aspects of kidney injury due to tumor lysis in patients in the intensive care unit and the reports of the nurse professional in publications about this complication, so rarely reported by this professional. The inclusion and exclusion criteria were applied and 4 articles were explained in a table with a period of time from 2013 to 2020.¹³

Chart 1- Stratification of the main factors of tumor lysis syndrome, as well as the epidemiology, pathophysiology and therapy used and the search for the knowledge of the professional nurse in related articles.¹⁴⁻¹⁷

Author	Title	Objective	Results	Conclusions
Tallo FS et al	Tumor Lysis Syndrome: a review for the clinician	Describe, through the integrative review, the Tumor Lysis Syndrome and the current aspects of its treatment.	Cancer Metabolic emergency Cell lysis	It's highlighted the therapy and cause of SLT and the risk factors for the disease. Did not demonstrate and / or cited the nurse's knowledge about the pathology.
Giongo SM et al	Tumor Lysis Syndrome	Describe the protocol of therapeutic options for cancer patients with SLT.	Tumor lysis syndrome Treatment Prevention Epidemiology Pathophysiology	It was explained about the treatment and prevention, as well as the epidemiology of the disease and pathophysiology, without demonstrating the knowledge of nursing and the care performed by it.
Wang Y et al	Impact of daytime continuous veno-venous haemofiltration on treatment of paediatric Tumour Lysis Syndrome	Describe the efficacy of continuous venous venous hemofiltration during the day in pediatric treatments	Renal therapy Pediatric treatment Acute kidney injury	It aimed at the efficacy and results of continuous daytime venous venous hemofiltration for pediatric treatment of SLT, not mentioning the role of the nursing team as well as their knowledge about the disease.
Armaly Z et al	Tumor Lysis Syndrome in chronic lymphocytic leukemia: a rare case repost from nephrology	Justify a case of a patient with spontaneous tumor lysis syndrome in the initial low dose of steroid therapy.	Tumor Lysis Syndrome Chronic lymphocytic leukemia Acute kidney injury	He stressed the less frequent chance and the case reports of the occurrence of the tumor lysis syndrome in chronic and solid tumors, not to mention the knowledge of the intensive care nurse.

The articles that were explained in the table above showed a review of the neoplasms most likely to have tumor lysis syndrome (SLT), as well as the factors of their clinical presentation and metabolic investigation. In the first article, the criteria for the laboratory diagnosis of tumor lysis syndrome, which is uric acid greater than or equal to 8mg / dL or 25% than the baseline value, potassium greater than or equal to 6 mEq / L or 25%, can be observed. baseline, phosphate greater than or equal to 4.5 mg / dL in adults, greater than 6.5 mg / dL in children than or above baseline, calcium less than or equal to 7 mg / dL or 25% less than the baseline value, with criteria for 3 days before and up to 7 days after treatment.

All anamnesis must be performed, as it may disappear. It also showed that there is a greater risk of clinical tumor lysis syndrome occurring in patients with cardiac arrhythmia, seizures, oliguria or increase of 0.3 mg / dL of creatinine.¹⁰ It can also be noted in the first article in the table that there are few studies published investigating the best form of monitoring. A guideline proposes the following form: in high-risk patients: DHL, uric acid, creatinine, potassium, sodium, phosphorus and calcium and every 12 hours for the first three days and every 24 hours for the following.¹⁴ It was observed in the second table the tumor therapy and the prevention of tumor lysis syndrome, that suspicion and surveillance are fundamental in patients at risk, cytotoxic therapy can be postponed in order to institute prophylactic measures in order to reduce clinical manifestations. Hydration and monitoring through the hydroelectrolytic balance every six hours is essential.¹⁵

In the third article, the efficacy of veno-venous hemofiltration was continuously observed in the pediatric treatment of lysis of the tumor syndrome, since this pathology has a rare occurrence in this type of patient. Observations were made of 08 patients aged 5 to 14 years recently treated for acute lymphoblastic leukemia. Treatment of tumor syndrome lysis was started with CVVH Veno-venous hemofiltration lasting 8-80 hours with assessment of urinary production, uric acid, potassium, phosphate, calcium. It was evaluated that the calcium returned to normal levels, however the recovery of renal function was slow. Urine production in three patients with anuria or oliguria returned to normal within three days after CVVH. The number of serum creatinine returned to normal in all patients after 23 days of CVVH, the phosphate was regularized in the 5 days of treatment, the potassium level at 1 day and hyperuricemia at 4 days after CVVH. Hear evidence of metabolic improvement after starting treatment by continuous venous venous hemofiltration.¹⁶

A rare report of chronic stable lymphocytic leukemia has been described that spontaneously evolved to tumor lysis syndrome after a short dose of steroids. With that we talk about the importance of making the differential diagnosis of any acute renal failure in the constellation of any malignancy.¹⁷

Final Consideration

Tumor lysis syndrome is the most common oncological emergency in both adults and children. Although there is no universally accepted definition or diagnostic criteria, SLT is understood as a set of metabolic disorders that result largely from the distribution of tumor cells that can be spontaneous or secondary to the initiation of treatment. Tumor lysis generates massive release of intracellular content, including nucleic acids and electrolytes into the bloodstream, which can trigger the development of hyperkalaemia.

Among the risk factors for developing AKI, preexisting clinical diseases and therapeutic interventions stand out, in addition to individual susceptibility that can affect renal function. There is also a relationship with the aging process, linked to chronic-degenerative diseases and morphofunctional renal changes. The early diagnosis of AKI is directly related to the best prognosis of critical clinical patients, and among the commonly used strategies, there is the

measurement of biological markers, based on the analysis of laboratory data, which signal acute changes that interfere with renal function.

Based on the assumption that AKI worsens the prognosis of patients in the ICU and that prevention and early treatment strategies ensure a better evolution of the clinical picture, the performance of a specialized multidisciplinary team is essential to minimize complications and start the appropriate treatment early. case, in the intensive scenario. Emphasis should be placed on the nursing team, as it is the largest provider of specialized care. It can be said that the nurse has a substantial role.

Acute Kidney Injury (AKI) is a systemic, multifactorial disease that contributes to increased morbidity and mortality in patients admitted to the Intensive Care Unit (ICU). In the hospital environment, it is one of the most frequent complications in hospitalized patients, whose prevalence ranges between 15 and 30%, however, in ICUs, this value is practically doubled. It is estimated that 13% of patients in these units will be treated with renal replacement therapy, of which 50 to 60% will die. Among the risk factors for developing AKI, preexisting clinical diseases and therapeutic interventions stand out, in addition to individual susceptibility that can affect renal function. There is also a relationship with the aging process, linked to chronic-degenerative diseases and morphofunctional renal changes.

Despite current studies, the constant search for the knowledge of the professional nurse is known that SLT is an oncological emergency with a high morbidity rate, where the main strategy to improve the evolution of patients is to establish prophylactic measures and appropriate treatment with urgency. There must be a continuous analysis of the nurse, as well as of the entire team, risk stratification and elaboration of hydroelectrolytic and laboratory control protocols and the direct care provided to this patient profile in the intensive care unit.

In view of the research carried out, it can be highlighted as a limitation of the study that there are no reports from nurses about the lysis of the tumor syndrome, since the reports of this pathology are extremely important in decision-making and in the care process. Therefore, there is a need for a new updated future study with an approach on the topic.

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