RBFHSS
Revista Brasileira de Farmácia Hospitalar e Serviços de Saúde

Original Paper

Open Access

Pharmacotherapeutic monitoring of oncological patients in palliative care during hospitalization

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Submitted: 16-04-2024 Resubmitted: 22-08-2024 Accepted: 30-08-2024

Double blind peer review

Abstract

Objective: To analyze Drug Related Problems (DRP) and pharmaceutical interventions performed through pharmaceutical care monitoring of cancer patients admitted to an exclusive palliative care unit at a reference institute in Rio de Janeiro. **Method:** An observational, descriptive, retrospective study with a quantitative approach was conducted. The population consisted of patients admitted and under pharmaceutical care monitoring from June 2022 to May 2023. Data were collected from physical medical records, institutional electronic systems, and specific spreadsheets. Sociodemographic, clinical, and pharmacotherapeutic variables were analyzed. **Results:** A total of 283 patients were evaluated, ranging in age from 21 to 85 years, with the majority being 60 years or older (n=153; 54.1%; mean age = 60.1; standard deviation = 8.2) and predominantly female (n=186; 65.7%). The most frequent primary tumor site was the digestive system (n=56; 19.8%) followed by breast and gynecological sites (n=55; 19.4%). Regarding comorbidities, most patients had at least one (n=166; 58.7%), with the circulatory system (n=121; 42.7%) being predominant. The percentage of patients with DRP was 50.9% (n=144). A total of 298 DRP were observed, among which the non-use of the necessary medication for the patient was highlighted (n=106; 35.6%). A total of 302 interventions were performed, mainly regarding the inclusion of a new medication (n=87; 28.8%). There was a 93% acceptance rate of the interventions performed. **Conclusion:** The clinical role of the pharmacist within a multidisciplinary team enables the identification of Drug-Related Problems (DRPs), thereby contributing to the rational and safe use of medications through the optimization of prescriptions and rationalization of pharmacotherapy.

Keywords: oncology, palliative care, pharmacist.

Acompanhamento farmacoterapêutico de pacientes oncológicos em cuidados paliativos durante a internação hospitalar

Resumo

Objetivo: Analisar os Problemas Relacionados a Medicamentos (PRM), e as intervenções farmacêuticas realizadas a partir do acompanhamento farmacoterapêutico dos pacientes com câncer, internados em uma unidade de cuidados paliativos exclusivos, em um instituto de referência no Rio de Janeiro. **Método:** Foi realizado um estudo observacional, descritivo, retrospectivo, com abordagem quantitativa. A população consistiu em pacientes internados e em acompanhamento farmacoterapêutico no período de junho de 2022 a maio de 2023. Os dados foram coletados de prontuários físicos, sistemas institucionais eletrônicos e planilhas específicas. Foram analisadas variáveis sociodemográficas, clínicas e farmacoterapêuticas. **Resultados:** Foram avaliados 283 pacientes, entre 21 e 85 anos de idade, cuja maioria possuía 60 anos ou mais (n=153; 54,1%; idade média = 60,1; desvio padrão = 8,2) e pertencia ao sexo feminino (n=186; 65,7%). O sítio tumoral primário mais frequente foi do aparelho digestivo (n= 56; 19,8%) seguido por mama (n= 55; 19,4%) e ginecológicos (n= 55; 19,4%). Em relação às comorbidades, a maior parte dos pacientes apresentou pelo menos uma (n= 166; 58,7%), sendo o sistema circulatório (n= 121; 42,7%) o predominante. A porcentagem de pacientes que apresentou PRM foi de 50,9% (n= 144). Observou-se 298 PRM, dentre os quais foi destacada a não utilização do medicamento necessário ao paciente (n= 106; 35,6%). Foram realizadas 302 intervenções no total, principalmente em relação à inclusão de um novo medicamento (n= 87; 28,8%). Houve 93% de aceitabilidade das intervenções realizadas. **Conclusão:** A atuação clínica do farmacêutico na equipe multiprofissional possibilita a identificação dos PRM contribuindo, então, para o uso racional e seguro dos medicamentos, por meio da otimização da prescrição e racionalização da farmacoterapia.

Palavras-chave: oncologia, cuidados paliativos, farmacêutico.

Introduction

Palliative care can be defined as comprehensive healthcare provided to individuals with serious, progressive, and life-threatening illnesses, aiming to promote the quality of life for both the patient and their family[1].

Its guiding principles are based on initiating patient follow-up as early as possible, in conjunction with disease-modifying treatments. Furthermore, the interdisciplinary approach is also a key principle that facilitates access to the clinical and psychosocial needs of the patient and their family[2].

It is estimated that approximately 57 million people worldwide require palliative care each year, with 25 million of them in the end-of-life stage[3]. Patients in palliative care may experience uncomfortable symptoms that typically interfere with their quality of life, such as pain, fatigue, poor sleep quality, discomfort, depression, dysphagia, loss of appetite, poor nutritional status, and taste changes[4].

The complexity of palliative care for cancer patients is reflected in various aspects involving symptom management, emotional support, and the organization of the care network. This complexity arises from the multifaceted nature of the disease and the varied needs of patients and their caregivers[5, 6].

Given this challenge, the presence of a multidisciplinary team can contribute to a better approach to these patients. Although the minimum recommended team consists of a physician, nurse, and social worker, the complementary involvement of other healthcare professionals such as pharmacists, physiotherapists, psychologists, and nutritionists is necessary to provide individualized care that addresses each patient's specific needs and demands[7].

Pharmacists are tasked with directly providing patient-related services, promoting health education and screening, performing pharmacotherapy reviews, dispensing, medication reconciliation, pharmacotherapeutic follow-up, among other responsibilities[8]. During pharmacotherapeutic follow-up, the pharmacist assesses the individual's health conditions, risk factors, and treatment, in addition to possibly implementing a set of management and educational interventions[9]. The primary goal of this service is to prevent and resolve medication-related problems (MRPs) and negative outcomes related to pharmacotherapy, aiming to reduce risks and contribute to the quality and safety of the care provided[10], with the potential to positively impact the patient's quality of life[11].

Few studies in the literature have longitudinally analyzed the MRPs involved in the pharmacotherapy of cancer patients in palliative care. Although in many cases the concurrent use of multiple medications is necessary, it increases the likelihood of adverse reactions, medication errors, drug interactions, and challenges in treatment adherence.

In light of the above, the objective of this study was to analyze the MRPs and pharmaceutical interventions conducted through pharmacotherapeutic follow-up of cancer patients admitted to a dedicated palliative care unit in a reference institute in Rio de Janeiro.

Methods

This is an observational, descriptive, retrospective study with a quantitative approach. The study was conducted at Hospital do Câncer IV (HCIV), a dedicated palliative care unit of the National Cancer Institute (INCA). HCIV operates with multidisciplinary teams and provides outpatient consultation services, home visits, and inpatient care. The hospital has 56 inpatient beds distributed across four floors. In 2021, there were 1,348 hospitalizations and 12,033 consultations conducted by healthcare professionals, including medical and multidisciplinary teams[12]. The pharmaceutical visits took place on two floors of the institution, on weekdays, conducted by the responsible clinical pharmacist and residents.

The study population consisted of cancer patients in palliative care, admitted to HCIV, who were under pharmacotherapeutic follow-up between June 1, 2022, and May 31, 2023.

Patients aged 18 or older who received pharmaceutical visits were included in the study. No sample size calculation was required, as all patients who met the inclusion criteria were selected.

Patients with incomplete pharmacotherapeutic follow-up records and those with a Karnofsky Performance Status (KPS) < 30 were excluded from the research.

Data were collected from physical records, institutional electronic systems (Absolute and Intranet), and the pharmacotherapeutic follow-up spreadsheet of the department. The data were then compiled into a database in Microsoft Office Excel®, specifically created for this study. The project was approved by the INCA Research Ethics Committee (CAAE 69503823.2.0000.5274).

The collected variables were subdivided into sociodemographic, clinical, and pharmacotherapeutic categories. As a sociodemographic component, age was considered, calculated from the birth date provided in the records, subtracted from the date of the start of the pharmacotherapeutic follow-up, and gender, dichotomized as female or male.

Regarding clinical variables, the primary tumor location, comorbidities, and patient functional capacity were described. The primary tumor location considered was that recorded in the patient's chart at the time of referral to HCIV, categorized according to the groups proposed by the malignant tumor classification: Head and Neck Tumors, Digestive System Tumors, Breast Tumors, Gynecological Tumors, Lung and Pleural Tumors, Bone and Soft Tissue Tumors, Melanoma, Urological Tumors, Hodgkin Lymphoma, Central Nervous System Tumors[13]. Comorbidities were classified according to the major groups outlined by the International Classification of Diseases (ICD), following the patient's chart and the reports from the patient and/or companion[14].

The patient's functional capacity assessment was based on the nursing team's records from the first day of pharmacotherapeutic follow-up, according to the KPS scale[15]. This scale is used to measure a sick individual's activity, their disability, or their recovery with an established therapy. It consists of 11 levels of "performance," ranging from 0 to 100%, divided into 10% intervals, where "0" indicates death and "100" indicates normal performance, without disease-related changes.

As pharmacotherapeutic variables, the MRPs identified by the pharmacist, the types of pharmaceutical interventions performed, and their acceptance by the medical team were evaluated. MRPs were classified according to the second Granada consensus[16]: MRP 1: the patient does not use medications they need; MRP 2: the patient uses medications they do not need; MRP 3: the patient uses an improperly selected medication; MRP 4: the patient uses a dose, frequency, and/or duration lower than necessary; MRP 5:

the patient uses a dose, frequency, and/or duration higher than necessary; MRP 6: the patient uses a medication that causes an adverse reaction; MRP 7: others.

Medications were collected from the current medical prescription and classified according to level 1 (anatomical group) of the Anatomical Therapeutic Chemical (ATC) classification. These include: Digestive System and Metabolism, Blood and Hematopoietic Organs, Cardiovascular System, Dermatologicals, Genitourinary System and Sex Hormones, Systemic Hormones, Antiinfectives for Systemic Use, Antineoplastics and Immunomodulators, Musculoskeletal System, Nervous System, Ophthalmological and Otological Preparations, Respiratory System, General and Various Products.

Pharmaceutical interventions were performed directly with the prescriber and classified as follows: inclusion of medications, dose adjustment, substitution of medication within the same therapeutic class, medication exclusion, frequency adjustment, change of pharmaceutical form, change of route of administration, and others. Acceptance was dichotomized as yes or no. This classification was adopted by the service and validated based on the second Granada consensus and the Otero-Lopez (2008) study, according to approval by INCA's pharmacy service specialists[16,17].

Descriptive statistical analyses were performed using Stata® software, version 15.0. The number of observations and frequencies were used to describe categorical variables.

Results

A total of 283 patients were evaluated (Figure 1), ranging in age from 21 to 85 years, with the majority being 60 years or older (n=153; 54.1%; mean age = 60.1; standard deviation = 8.2), and predominantly female (n=186; 65.7%) (Table 1).

The most frequent primary tumor site was the digestive system (n=56; 19.8%), followed by breast (n=55; 19.4%) and gynecological tumors (n=55; 19.4%). Regarding comorbidities, most patients had at least one (n=166; 58.7%), with circulatory system diseases being the most common (n=121; 42.7%). In terms of functional capacity, the majority of patients had a KPS of 30% (64.3%, n=182) (Table 1).

Figure 1. Flowchart of Patient Selection for the Study (Rio de Janeiro, Brazil).

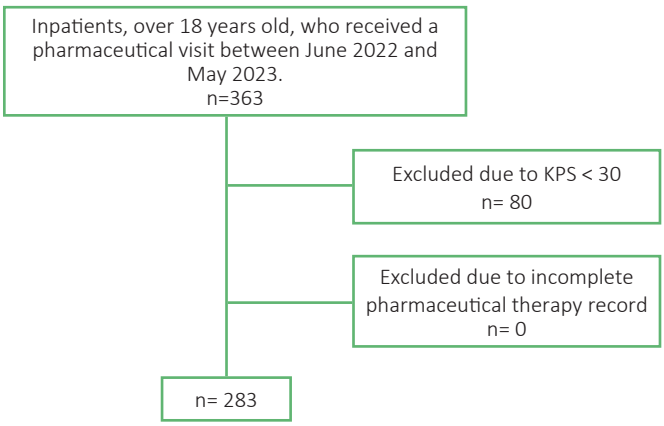

Table 1: Sociodemographic and Clinical Profile of Cancer Patients in Palliative Care Undergoing Pharmacotherapeutic Follow-up (N= 283) (Rio de Janeiro, Brazil, 2022-2023).

Variables	n (%)
Age (years)	
<60	130 (45,9)
≥60	153 (54,1)
Sex	
Male	97 (34,3)
Female	186 (65,7)
Primary tumor location	
Digestive system	56 (19,8)
Breast	55 (19,4)
Gynecological	55 (19,4)
Urological	34 (12,0)
Head and neck	33 (11,7)
Lung and pleura	16 (5,7)
Bone and soft tissue tumors	12 (4,2)
Melanoma	10 (3,6)
Central Nervous System	8 (2,8)
Others[a]	4 (1,4)
Comorbidities*	
No	117 (41,3)
Yes	166 (58,7)
Types of Comorbidities	
Circulatory system	121 (42,7)
Endocrine, nutritional, and metabolic diseases	91 (32,1)
Nervous system	13 (4,6)
Genitourinary system	8 (2,8)
Musculoskeletal system and connective tissue	5 (1,7)
Eye and adnexa	4 (1,4)
Digestive system	3 (1,0)
***Karnofsky Performance Status* (KPS) (%)**	
30	182 (64,3)
40	64 (22,6)
50	28 (9,9)
60	9 (3,2)

Nota: [a]Linfoma Não Hodgkin, Mieloma Múltiplo, Tumor de sítio primário desconhecido.*A single patient may have had more than one type of comorbidity.

The percentage of patients who experienced medication-related problems (MRPs) was 50.9% (n=144). A total of 298 MRPs were observed, with the most prominent being the non-use of necessary medication (n=106; 35.6%) (Table 2).

The drug classes with the highest number of MRPs were Digestive System and Metabolism (41.3%), followed by the Nervous System (35.9%) (Table 3).

During pharmacotherapeutic follow-up, 144 patients received pharmaceutical interventions, with a total of 302 interventions performed, primarily related to the inclusion of medications (n=87; 28.8%), averaging 2.1 interventions per patient (standard deviation = 1.5). The acceptance rate of the interventions was 93% (Table 4).

Table 2: Classification of MRPs Presented by Cancer Patients in Palliative Care Undergoing Pharmacotherapeutic Follow-up (N= 298) (Rio de Janeiro, Brazil, 2022-2023).

Classification of MRPs*	n (%)
Does not use the necessary medication	106 (35,6)
Uses medication that is not needed	62 (20,8)
Medication that is not effective for the patient	7 (2,4)
Medication with a dose lower than required	44 (14,8)
Medication causes adverse reactions	10 (3,4)
Medication with a dose higher than required	35 (11,7)
Others	34 (11,3)

Note: MRP = Medication-Related Problems.*A single patient may have presented with more than one type of MRP, and each type of MRP may have occurred more than once.

Table 3: Medications Involved in MRPs According to ATC Classification (Rio de Janeiro, Brazil, 2022-2023).

ATC Classification	Quantity	%
Digestive System and Metabolism	123	41,3
Nervous System	107	35,9
Systemic Hormonal Preparations	19	6,4
Cardiovascular System	16	5,4
Anti-infectives for systemic use	15	5
Dermatological	5	1,7
Blood and hematopoietic organs	5	1,7
Respiratory system	3	1
Ophthalmic Preparations	3	1
Others*	2	0,6

Note: * General and Miscellaneous Product System.

Table 4: Pharmaceutical Interventions Performed on Cancer Patients in Palliative Care Undergoing Pharmacotherapeutic Follow-up (N= 302) (Rio de Janeiro, Brazil, 2022-2023).

Classification of Pharmaceutical Interventions*	n (%)
Inclusion of medication	87 (28,8)
Exclusion of medication	81 (26,8)
Dose adjustment	59 (19,5)
Frequency adjustment	36 (11,9)
Substitution of medication within the same therapeutic class	15 (5,0)
Change in dosage form	11 (3,8)
Adjustment of route	8 (2,6)
Others[a]	5 (1,6)
Number of accepted pharmaceutical interventions	281 (93%)

Note: [a] therapeutic duplication, incompatible route of administration, and discrepant units of measurement. *A single patient may have received more than one type of pharmaceutical intervention, and each type of pharmaceutical intervention may have occurred more than once.

Discussion

The increase in life expectancy significantly contributes to the growth of chronic-degenerative diseases, such as cancer. Considering the profile of cancer patients under exclusive palliative care, other studies conducted in oncology reference hospitals, like the present study, have also demonstrated a predominance of patients over 60 years of age and of the female gender[18,19].

In Brazil, breast cancer is the most common among women, followed by colorectal and cervical cancers[19]. The most frequent neoplasms in patients followed at HCIV were similar to those affecting women in the country: breast, gynecological, and digestive system cancers. According to Chaves et al. (2021), these data are consistent with cancer incidence rates in other developing countries, and these tumors are preventable through the early detection of precursor lesions[20].

Douberin et al. (2019) state that risk factors such as physical inactivity, excessive alcohol consumption, and poor diet may increase the risk of cancer, as well as comorbidities involving the circulatory system and endocrine, nutritional, and metabolic diseases. These comorbidities can impact patient survival. Although the association between some comorbidities and cancer is evident, it remains poorly understood[21].

Low KPS is a prognostic factor for shorter survival in hospitalized patients, meaning those with a KPS of 40-30% typically have poorer survival rates, which may directly affect their overall health and quality of life compared to individuals with higher functionality. However, the KPS value for each primary tumor site may represent a different prognosis[21,22], and according to the profile of the study patients, 86.9% had a KPS of 40-30%.

A study conducted at HCIV with hospitalized patients reported that, during the last month of life, the decline in KPS was more pronounced in individuals with gastric and head and neck tumors. Meanwhile, patients with central nervous system and lung and pleura cancers started with lower KPS values, and their reduction was less significant compared to others[22]. These differences highlight the importance of individualized pharmacotherapeutic assessment for each type of patient, considering their tumor and prognosis.

Due to the natural course of the disease, as well as past or even current treatments, Yates (2021) explains that cancer patients under palliative care often exhibit multiple symptoms, requiring extensive pharmacotherapy[23]. However, hospitalization commonly results in significant changes to pharmacotherapy, either to add medications to control symptoms or to deprescribe unnecessary ones[24,25]. In this study, the medication classes with the highest number of MRPs and pharmaceutical interventions were digestive and metabolic systems and the nervous system.

Ko et al. (2023) suggest that deprescription is a practice recognized not only by healthcare professionals but also by patients and caregivers, with over 70% of patients expressing a desire to reduce the number of prescribed medications, if feasible[26].

In a study on medication therapy management, Souza et al. (2020) identified the most common problems as the non-use of necessary medication and the use of unnecessary medication[27]. These findings align with this study's data, where both MRPs accounted for 56.4% of all interventions performed. The similarity between studies demonstrates that both underuse and overuse of medications are significant challenges in clinical practice. Therefore, the high frequency of these MRPs points to the need for strategies aimed at monitoring and reviewing medical prescriptions to optimize medication use.

Crul and Oosterhof (2020) state that the integration of a clinical pharmacist in the palliative oncology team resulted in interventions on duplicate therapies, adverse effect control, and untreated conditions, with 94% of interventions accepted by the medical team[28], a considerably high acceptance rate, which supports the results of this study. This reflects the importance of incorporating this professional into clinical practice, particularly in the context of the complexities of palliative care.

A study conducted in a hospital in São Paulo, specifically in the Intermediate Care Unit, describes pharmaceutical interventions during pharmacotherapeutic follow-up, with the most frequent being the removal of unnecessary medications and the inclusion of important medications that were not prescribed[29], aligning with the results presented in this study.

Comparing the role of pharmacists in several countries in the palliative care setting, Krzyżaniak et al. (2016) found that although this is a relatively unexplored area, palliative care pharmacists play a direct role in patient care by contributing to appropriate symptom management, rational prescribing, and psychological support for those involved[30].

In this study, MRPs were identified and interventions were carried out according to the clinical experience and expertise of each pharmacist, allowing for potential information bias and classification errors, despite efforts to minimize such errors. Regarding limitations, it is worth mentioning that pharmacotherapeutic follow-up was conducted only in part of the hospital ward (two of the four floors). Additionally, the data presented reflect the reality of a health unit specializing in exclusive palliative care, which requires caution regarding representativeness and applicability to other institutions. The retrospective nature of the study could also be considered a limitation, as it prevents patient monitoring during the studied event. For future research, we aim to expand the study to cover the entire hospital and assess outcomes prospectively.

Conclusion

The study enabled the identification of, on average, one MRP per patient, predominantly involving medications acting on the nervous system, digestive system, and metabolism.

The clinical role of the pharmacist within the multidisciplinary team facilitated the identification of MRPs, contributing to the rational and safe use of medications through pharmacotherapy optimization. This study adds to the body of research that demonstrates the benefits of integrating this professional into the multidisciplinary team and suggests the need to expand clinical pharmaceutical services to other units of the Unified Health System (Sistema Único de Saúde), which could serve as a model for other institutions or services.

Funding Sources

The research did not receive funding for its execution.

Collaborators

Choice of the topic: VML. Conception and design of the research: VML, LFVM, and LAB. Data collection: VML and RMM. Data analysis and interpretation: VML, LFVM, and LAB. Statistical analysis: LCO and LAB. Manuscript drafting: VML, RMM, LAB, LCO, and LFVM. Critical manuscript review for intellectual content: RMM, LFVM, and LAB. All authors approved the final version and are responsible for all aspects of the work, including ensuring its accuracy and integrity.

Conflict of Interest Statement

The authors declare no conflict of interest regarding this article.

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