



## Research Article

# Mortality Within 30 Days of Administration of a Systemic Anticancer Therapy in a Medical Oncology Unit of Yaounde

*Mortalité dans les 30 Jours Suivant l'Administration d'une Thérapie Anticancéreuse Systémique dans une Unité d'Oncologie Médicale à Yaoundé*

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## ABSTRACT

**Introduction.** Various drugs are used to treat cancer, including cytotoxic chemotherapy, hormone therapy, targeted therapies or biotherapies, and immunotherapy. Mortality within 30 days of the administration of systemic anticancer therapy (SACT) has been proposed as an indicator of quality of care. The aim of our study was to report mortality within 30 days of administration of SACT in a medical oncology unit in sub-Saharan Africa. **Methods.** This was a cross-sectional, descriptive study conducted from 1 January 2021 to 31 December 2021 in the medical oncology department of the Yaoundé General Hospital on all cancer patients who received SACT and died within 30 days of the administration of this treatment were included in this study. **Results.** We registered 1056 patients who received systemic anticancer treatment, 31 died within 30 days of administration, giving a mortality rate of 2.9%. The mean age was 53.3 years and the sex ratio was 0.35. Among our patients, advanced cancer was found in 96.8% of which 90.3% were treated for palliative reasons. Chemotherapy was the last therapeutic modality most frequently used (83.8%). Three causes were the leading immediate causes of death: cerebral failure (19,4%), combined cancer and sepsis (19,4%), and sepsis (19,4%). **Conclusion.** The percentage of deaths within 30 days of administration of a SACT in this study is close to the lower limit of the various values found in the literature. The administration of SACT in sub-Saharan Africa is not aggressive.

## RESUME

**Introduction.** Divers médicaments sont utilisés pour traiter le cancer, notamment la chimiothérapie cytotoxique, la thérapie hormonale, les thérapies ciblées ou la biothérapie, et l'immunothérapie. La mortalité dans les 30 jours suivant l'administration d'une thérapie anticancéreuse systémique (SACT) a été proposée comme un indicateur de la qualité des soins. L'objectif de notre étude était de rapporter la mortalité dans les 30 jours suivant l'administration de SACT dans une unité d'oncologie médicale en Afrique subsaharienne. **Méthodes.** Il s'agissait d'une étude transversale et descriptive menée du 1er janvier 2021 au 31 décembre 2021 au service d'oncologie médicale de l'Hôpital Général de Yaoundé sur tous les patients atteints de cancer ayant reçu SACT et décédé dans les 30 jours suivant l'administration de ce traitement ont été inclus dans cette étude. **Résultats.** Nous avons enregistré 1056 patients ayant reçu un traitement anticancéreux systémique, 31 sont décédés dans les 30 jours suivant l'administration, ce qui représente un taux de mortalité de 2,9%. L'âge moyen était de 53,3 ans et le ratio des sexes était de 0,35. Parmi nos patients, un cancer avancé a été trouvé chez 96,8% d'entre eux, dont 90,3% étaient traités pour des raisons palliatives. La chimiothérapie était la dernière modalité thérapeutique la plus fréquemment utilisée (83,8%). Trois causes étaient les principales causes immédiates de décès : l'insuffisance cérébrale (19,4%), le cancer combiné et la septicémie (19,4%), et la septicémie (19,4%). **Conclusion.** Le pourcentage de décès dans les 30 jours suivant l'administration d'un SACT dans cette étude est proche de la limite inférieure des différentes valeurs trouvées dans la littérature. L'administration de SACT en Afrique subsaharienne n'est pas agressive.



### HIGHLIGHTS

**What is known of the subject**

Systemic anticancer therapy (SACT) includes cytotoxic chemotherapy, hormone therapy, targeted therapies or biotherapies, and immunotherapy

**The aim of our study**

Mortality within 30 days of administration of SACT in a medical oncology unit in sub-Saharan Africa

**Key Results**

1. The mean age was 53.3 years and the sex ratio was 0.35.
2. The mortality rate was 2.9%.
3. Chemotherapy was the last therapeutic modality most frequently used (83,8%).
4. Three conditions were the leading immediate causes of death: cerebral failure (19,4%), combined cancer and sepsis (19,4%), and sepsis (19,4%).

**Implications for future practices and policies**

Assessing the quality of care administered in oncology enables the various teams in charge of these patients to question themselves in order to improve.

### INTRODUCTION

Cancer is a public health problem, with a worldwide incidence of almost 20 million cases in 2020 [1]. Over the last twenty years, incidence has been on the rise in sub-Saharan Africa (with an annual growth rate of more than 5%), where the annual incidence rate has increased by more than 5% [2]. Ongoing progress is being made in its management [3]. Systemic anticancer therapy (SACT) includes cytotoxic chemotherapy, hormone therapy, targeted therapies or biotherapies, and immunotherapy. Whereas SACT were only available for a minority of solid tumours, they are now available for a plethora of cancers [4]. Like chemotherapy, these treatments improve the survival and quality of life of cancer patients [5]. Their use has been increasing for several decades [4]. At the same time, there has been an improvement in the identification, staging and management of toxicities associated with these SACT. The medical oncologist coordinates the team administering these SACT, and assesses the indication from the point of view of the disease and the patient. These indications are based on rationales and studies which have led to recommendations that take into account the benefits and risks of these treatments, while ensuring optimal quality of life for patients [6]. Chemotherapy can be used at various stages of the disease, particularly in the context of palliative care. Patients should benefit early from palliative care. It reduces the need for administration of SACT close to the end of life [7]. Authors have proposed different types of indicators to assess the quality of care for patients near the end of life, including: the frequency of chemotherapy administration, admission to emergency departments, hospitalisation in intensive care units, and delay or absence of referral to a palliative care service or hospice [8]. Mortality within 30 days of administration of a SACT has also been proposed as an indicator of quality of care [9]. A patient who dies within 30 days of receiving a SACT may not have gained either survival or quality of life [10]. In a Canadian study conducted in

2011, it was found that the administration of anti-cancer treatments to patients at the end of life had increased twenty years previously [11]. The decision to stop specific treatment and use only supportive care is not an easy one [12]. It is made all the more difficult by patients who sometimes request intensive treatment procedures even when the prognosis is poor [13]. The African literature on mortality within 30 days of SACT administration is sparse. The aim of our study was to report mortality within 30 days of SACT administration in a medical oncology unit in sub-Saharan Africa.

### PATIENTS AND METHODS

This was a cross-sectional, descriptive study conducted from 1 January 2021 to 31 December 2021 in the medical oncology department of the Yaoundé General Hospital. Solid tumours and certain haematological malignancies, excluding acute leukaemia, are treated in this department. All cancer patients who had received systemic anticancer treatment and died within 30 days of the administration of this treatment were included in this study. The sampling technique was non-probability based on consecutive recruitment of patients who met the inclusion criteria. The various data concerned the epidemiological and clinical characteristics of the patients, the characteristics of the treatment and the immediate causes of death. The epidemiological and clinical characteristics of patients included age, sex, body mass index, primary site of cancer, and stage according to the American Joint Committee on Cancer (AJCC). The patient was considered malnourished if the body mass index (BMI) was less than 18.5 [14]. Treatment characteristics included intent of treatment (palliative or curative), route of administration, last type of SACT used before death, number of lines and compliance (for chemotherapy). The SACT considered were cytotoxic chemotherapy, targeted therapies and hormone therapy. As immunotherapy is not available in our Cameroonian context, it was not considered. The immediate cause of death was obtained using the WHO International Model Medical Certificate of Cause of Death for each patient. We then grouped the immediate cause of death into three groups: cancer-related, unrelated to cancer, or combined. The immediate cause was considered to be cancer-related if the location of the cancer (primary or secondary) could explain the death, without any other non-cancerous cause being incriminated. The immediate cause was considered to be unrelated to cancer if the location of the cancer (primary or secondary) could not explain the death and another cause was incriminated. The immediate cause was considered to be combined when the patient concomitantly had a cancer site (primary and/or secondary) that could explain the death, associated with another non-cancerous cause that could also explain the death. We also recorded the number of days the patient was hospitalised before death. The data were analysed using SPSS version 20 and Microsoft Office Excel 2010. Institutional ethics committee approval was obtained for this study. The data collected were processed in strict compliance with medical confidentiality. The results were used for scientific purposes.

## RESULTS

During the study period, 1056 patients received systemic anticancer treatment. Of these, 31 died within 30 days of administration, giving a mortality rate of 2.9%. The mean age was 53.3 years, with extremes of 23 and 79 years. The sex ratio was 0.35. The most common primary sites were breast (22.6%), haematological malignancies (12.9%), and head and neck (12.9%). Thirty patients (96.8%) had advanced cancer (Table I).

Items	N=31	%
<b>Sex</b>		
Female	20	64,5
Male	11	35,5
<b>BMI</b>		
< 18,5	7	22,6
18,5-24,9	19	61,3
25-29,9	4	12,9
≥ 30	1	3,2
<b>Primary cancer site</b>		
Breast	7	22,6
Haematological malignancies	4	12,9
Head and neck	4	12,9
Cervix	2	6,5
Stomach	2	6,5
Kidney	2	6,5
Soft tissue	2	6,5
Others	8	25,6
<b>AJCC cancer stage</b>		
II	1	3,2
III	3	9,7
IV	27	87,1

Of these patients, 28 (90.3%) were treated with palliative intent. Chemotherapy was the most commonly used treatment type (26 patients). One line of treatment had been used in 15 of them. The limiting doses of treatment were respected in all patients (Table II).

Variables	N=31	%
<b>Treatment intent</b>		
Curative	3	9,7
Palliative	28	90,3
<b>Route</b>		
Intravenous	23	74,2
Oral	8	25,8
<b>Last treatment type</b>		
Chemotherapy	26	83,9
Targeted therapy	5	16,1
<b>Line of chemotherapy</b>		
1	15	
2	4	
3	5	
> 3	2	
<b>Respecting treatment appointment</b>		
Yes	23	
No	3	

Three causes were the leading immediate causes of death: cerebral failure, the combination of cancer and

sepsis, and sepsis. Death was related to febrile neutropenia in 2 patients (Table III).

Immediate causes of death	N=31	%
<b>Cancer-related</b>		
Cerebral failure	6	19,4
Pulmonary failure	3	9,5
Multi organ failure	2	6,5
<b>Combined cause</b>		
Cancer and sepsis	6	19,4
Cancer and other infections (spontaneous bacterial peritonitis, pyelonephritis)	2	6,5
<b>Unrelated to cancer</b>		
Sepsis (non-neutropenic)	6	19,4
Neutropenic sepsis	2	6,5
Other infection	1	3,2
Pulmonary embolism	1	3,2
Subdural haematoma	1	3,2
Cardiac failure	1	3,2

Duration of hospitalisation prior to death varied between 8 and 30 days for 12 patients (Table IV).

Duration of hospitalisation prior to death (days)	N=31	%
< 1	3	9,7
1-3	6	19,4
4-7	8	25,8
8 – 30	12	38,7
> 30	2	6,5

## DISCUSSION

Mortality within thirty days of the administration of SACT is a proposed criterion for assessing the quality of oncology care. This criterion has several limitations. It does not meet the ideal characteristics: sensitivity, reproducibility, precision, easy interpretation [15]. It is nevertheless used by several authors on different continents (Europe, America, Asia) [16]. At the end of our work, we obtained a mortality rate of 2.9% within 30 days of the administration of SACT. In the literature, this percentage varies from author to author, ranging from 2% to 38% [17-19]. The various studies carried out on the subject are heterogeneous with regard to the type of SACT used in the patient [16]. Some include only chemotherapy, others include chemotherapy and targeted therapies, and others include chemotherapy, targeted therapies and hormone therapy [16]. Few studies include all currently available therapeutic modalities [16]. In sub-Saharan Africa, there is as yet no consensus on an acceptable percentage for mortality within 30 days of SACT. The average age of our patients was 53.3 years. This is 20 years less than that found by Nguyen et al in a population in Australia [16]. This difference may be explained by the location of the study. In Africa, cancers are diagnosed at a younger age, and so are cancer-related deaths. Seven of the thirty-one patients (22.6%) were malnourished. In oncology, depending on the type of

tumour, undernutrition varies between 31 and 87% [20]. Our percentage is lower than that in the literature because our assessment only took BMI into account. We did not assess patients' weight loss. In fact, an involuntary weight loss of more than 10% is also synonymous with undernutrition, regardless of BMI. Malnutrition is associated with a greater risk of infectious complications, longer hospital stays, poor tolerance and response to treatment, and poorer survival [21, 22, 23, 24]. Breast cancer was the most common cancer in our population. Ranking first in terms of cancer mortality in Cameroon, it is not surprising that it ranked first in terms of mortality within 30 days of the administration of systemic anticancer treatment. It also topped a similar study by Tashkandi et al [25]. Thirty of our 31 patients had advanced cancer. When the cancer is at an advanced stage, SACT is the most commonly used [26]. It has the capacity to reduce the size of the tumour and satellite adenopathies in patients with locally advanced cancer, and concomitantly to control all sites of the disease when it is metastatic. The intention of treatment was palliative in 90.3% of patients. The types of SACT found were standard chemotherapy and targeted therapies. No patients were treated with hormone therapy. Chemotherapy was the most commonly used treatment modality. Fifteen of the 26 patients who received chemotherapy had received a single line of treatment. Patients with metastatic cancer change their line of chemotherapy for 02 reasons: either the cancer has progressed or the toxicity of the drugs received is prohibitive. When the first line of treatment has failed in metastatic cancer, subsequent management is more complex, and it is generally accepted that the benefit of subsequent lines is not very great [27, 28]. Of the 26 patients who received chemotherapy, 03 did not keep their appointments. In sub-Saharan Africa, chemotherapy is not always accepted because of cultural beliefs or a particular socioeconomic environment [29]. Regarding the immediate cause of death, febrile neutropenia was incriminated in 02 patients (6.5%). Death due to febrile neutropenia is considered by some authors to be due to treatment [30]. Our percentage is slightly lower than that of O'Brien et al, who found febrile neutropenia to be the cause of death in 4% of cases [30]. Among the patients, 12 (38.7%) died after spending between 8 and 30 days on the ward, while 2 (6.5%) had stayed for more than 30 days. Hospices are used to care for patients at the end of life [31]. In our environment, such facilities are almost non-existent, leaving patients with no choice but to stay in hospital or at home before death.

## CONCLUSION

Assessing the quality of care administered in oncology enables the various teams in charge of these patients to question themselves in order to improve. The percentage of deaths within 30 days of SBT administration in this study was close to the lower limit of the various values found in the literature. The administration of SACT in sub-Saharan Africa is not aggressive.

## Limitations

Our study has a small sample size. In addition, we only worked with data on deaths within hospitals, as we had no data on deaths in the community. This may reduce the percentage of deaths. The immediate cause of death of the patients was not confirmed by autopsy.

## Ethical approval

Research authorizations and an ethical clearance were obtained from the Institutional Ethical Review Board No. 507/UY1/FMSB/VRDC/DAASR/CSD.

Written informed consent for participation was not required for this study.

## Competing interests

The authors declare that there is no conflict of interest regarding the publication of this paper.

## Authors' contributions

EAO contributed to study concept, and manuscript writing. LTF contributed to study concept, data acquisition, data analysis and manuscript writing. KCN contributed to data acquisition and data analysis. BSEM, EN and ABT contributed to manuscript writing. RT and AJFS contributed to study concept. ZS contributed to manuscript writing. PN contributed to study concept and manuscript writing. All authors read and approved the final manuscript.

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