

Clinical governance benchmarking issues in oncology: aggressiveness of cancer care and consumption of strong opioids. A single-center experience on measurement of quality of care

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ABSTRACT

Aims and background. The aggressiveness of cancer care near the end of life and the consumption of opioids are potential indicators of quality of care in palliative and end-of-life settings. The purpose of this article is to present a retrospective analysis regarding these themes and the adopted procedures to improve quality of care.

Methods. We evaluated all cancer patients treated and deceased during 2008 and considered those who died and received any antineoplastic therapy within 14 and 30 days prior to death. Moreover, we evaluated the annual consumption of pure opioids during 2007 and 2008 in our inpatient clinic.

We found that 5% and 9% of all treated patients were still receiving antineoplastic treatment near the end of life within respectively 14 and 30 days prior to death (respectively 29.6% and 51.5% of deceased patients). All but 2 patients died from progressive disease, one patient died from acute myocardial infarction during chemotherapy, and one of severe sepsis after chemotherapy for non-Hodgkin lymphoma. As regards the annual consumption of strong opioids, there was a 179% increase in the use of morphine-equivalent doses of oral long-acting opioids (+228% for oxycodone) after the introduction of daily pain measurement through a numerical rating scale.

Conclusions. To reduce the administration of chemotherapy near the end of life, we introduced the palliative prognostic score, to be administered to all advanced cancer patients with performance status of at least 2. To evaluate the effectiveness of analgesics and to reduce the cases of undertreatment of cancer pain, we adopted, in addition to the numerical rating scale, Cleeland's Pain Management Index. We are convinced that attempts to improve the quality of care can be achieved by the collaboration of all health professionals, patients and care givers. Free full text available at www.tumorionline.it

Introduction

Despite advances in the management of cancer and the increase in median overall survival for many types of cancer, a large proportion of patients still die from the disease¹. Therefore, the quality of medical care that incurable cancer patients receive is one of the major issues in palliative medicine and medical oncology. Nevertheless, relatively limited work has been carried out on how to identify models to evaluate the quality of care given to patients near the end of life².

Poor-quality care is defined as "when practices of known effectiveness are being under-utilized, practices of known ineffectiveness are being over-utilized, and when services of equivocal effectiveness are being utilized in accordance with provider rather than patient preferences"³. An overly aggressive cancer treatment

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probably represents poor-quality care, and we can use a set of measures to assess three major areas: the overuse of chemotherapy near death; high rates of emergency room visits, hospitalization or intensive care stays for terminal patients as a result of treatment; and underuse of hospice services².

According to the literature, the proportion of patients still receiving chemotherapy 14 days prior to death has increased, up from 9.7% in 1993 to 11.6% by 1999, even if there is evidence that the use of chemotherapy near the end of life is not related to clinical benefit^{2,4}. Hematological diseases were more frequently associated with aggressive chemotherapy, such as simply living in an area with more teaching hospitals or receiving care in a teaching hospital². Not surprisingly, when high-quality palliative care is available, a decrease in aggressive chemotherapy use is observed². Furthermore, we know that there is a trend towards being less satisfied with care, as perceived by the care giver, when chemotherapy is continued near the end of life, when death occurs in an acute care setting, or when there is only a short (≤ 3 days) hospice stay involved².

The European Association for Palliative Care strongly recommends the use of easy prognostic scores to identify classes of patients with different life expectancies⁵. The palliative prognostic score, the palliative prognostic index, the Chuang prognostic score, and the terminal cancer prognostic score are most frequently used. All of them have limitations but offer an improvement on the unadjusted clinicians' estimate of survival⁶.

The adequate treatment of cancer pain is a milestone of palliative and end-of-life care⁷. Even if it is well known that more than 60% of patients affected by advanced stage disease or metastatic cancer will experience symptom pain, and that an effective therapy is available for 70-90% of cases, undertreatment involves more than 40% of these patients⁸. Regarding the treatment of cancer pain, recent reports indicate that the level of opioid use is a novel indicator of the quality of end-of-life care, measuring underuse of palliative care, both in prospective and retrospective analyses⁹.

In an attempt to improve the quality of care in cancer patients, as criteria of efficacy we evaluated the annual percentage of patients receiving any antitublastic treatment (chemotherapy, radiotherapy, hormone therapy or pamidronate for bone metastases) 14 and 30 days prior to death and the annual consumption of pure opioids in the Operative Unit of Medical Oncology, City Hospital of Belluno. We present a retrospective analysis of the patients who died from cancer during 2008 and a comparative analysis of data regarding the use of strong opioids in 2007 and 2008.

Materials and methods

Antitublastic treatment 14 and 30 days prior to death

To determine the patients affected by cancer, treated and deceased during 2008, we used the electronic data base of our Unit, where any information regarding diagnosis, treatment, state of the disease and eventually date of death is reported. In the case of missing data, we verified the state of the patient through the Registrar's Office at the Municipality. We evaluated all patients who received chemotherapy and all deceased patients, analyzing the cause of death, age and performance status at the last antitublastic treatment, number of previous therapies, state of the disease, date the last treatment was begun, and date of death of the patient. We considered as active, any specific treatment (chemotherapy, radiotherapy, hormone therapy, biphosphonates for bone metastases) with the exception of radiotherapy for pain. We also excluded from the analysis patients who died from the disease and were affected by advanced cancer who never received any specific antitublastic therapy.

Annual consumption of major opioids

A retrospective analysis of the use of pure opioids in our Unit during 2007 and 2008 was carried out using the electronic data base of the Department of Pharmacy and considering the orders filled by the Unit of Oncology. Strong opioids regularly used include fentanyl transdermal patch (Durogesic), morphine chlorhydrate in vials, oral morphine prompt release (Oramorph oral solution, drops), oxycodone (Oxycontin), oral morphine chlorhydrate prolonged release (Ticinan) available since 2007, oral morphine sulphate prolonged release (Twice) available since 2007, and OROS[®] hydromorphone (Jurnista) available in the hospital's pharmacy since November 2008.

Local palliative care

In the geographic area of Belluno, according to the recommendations of the Veneto Region for palliative care, an Operative Unit of Analgesic Therapy, home-care assistance and hospice with a capacity of 8 beds are available. The structures for palliative care are coordinated by anesthesiologists and are available for patients affected by cancer with a life expectancy of less than 3 months. A terminally ill patient can also be admitted to the Operative Unit of the Medical Oncology ward (capacity 10 beds), like patients near the end of life and not receiving any antitublastic treatment but needing supportive care.

Results

Antitublastic treatment 14 and 30 days prior to death

During 2008, 364 patients received chemotherapy in the Operative Unit of Medical Oncology, City Hospital of

Belluno, and 64 patients affected by advanced cancer disease and treated in the same Operative Unit died. Of the treated patients, 33 (9%) died within 30 days of chemotherapy, whereas 19 (5%) received an active treatment within 14 days prior to death. Nevertheless, evaluating the group of deceased patients ($n = 64$), we found that 29.6% and 51.5% of patients were still receiving chemotherapy respectively within 14 days (19 patients, median 7 days, range 2-14) and 30 days prior to death (33 patients, median 12.5 days, range 2-30). The median age of deceased patients was 64 years (range, 42-84). All of them were affected by metastatic and/or locally advanced disease and received palliative therapy. The performance status was 1 in 12 patients (36.3%) and 2 or more in 21 patients (63.7%). Most of them were affected by advanced non-small cell lung cancer (NSCLC) (11 of 33, 33.3%), followed by breast cancer (4 of 33, 12.1%), small-cell lung cancer, gastric, pancreatic and gynecological cancer (3 patients, 9.1%), unknown primary tumor (2 patients, 6.06%), and other tumors (4 of 33, 12.1%).

Fourteen patients died after a first-line treatment (42.4%), 11 after a second-line (33.3%), and 8 after a third or more lines of therapy (24.2%). Seventeen of 33 patients (51.5%) died during hospitalization, 11 (33.3%) died in hospice, and 5 died at home (15.1%). Regarding the cause of death, all but 2 died from progressive disease. One patient affected by extended small cell lung cancer died from acute myocardial infarction during chemotherapy with carboplatin and etoposide. One female patient, treated in a University hospital and affected by Hodgkin's disease in a previous non-Hodgkin lymphoma and treated with anthracycline-based chemotherapy for relapse of the disease after high-dose chemotherapy and peripheral blood progenitor cell support, died of toxicity, with severe sepsis and pneumonia. All but 3 patients (90.9%) received chemotherapy as the last treatment. One patient affected by liver and bone metastases from NSCLC and with performance status 4, according to WHO criteria, received 90 mg pamidronate 2 days before dying, and 2 patients affected by lung, liver and brain metastases from an unknown primary tumor and locally advanced NSCLC, received respectively whole brain and thoracic radiation 8 and 3 days before death.

Details regarding characteristics of the deceased patients and schedules of chemotherapy used in the patients are reported in Tables 1 and 2, respectively. Table 3 reports the characteristics of the patients deceased during 2008 more than 30 days from their last treatment.

Annual consumption of pure opioids

Compared to 2007, in 2008 there was an increase of 179% regarding the use of oral long-acting opiates: oxycodone, oral morphine chlorhydrate prolonged release,

oral morphine sulphate prolonged release, and OROS® hydromorphone (19,000 mg in 2007 *vs* 53,120 mg in 2008; morphine-equivalent doses). An increase of 8% regarding morphine chlorhydrate for parenteral use was also reported (4600 mg in 2007 *vs* 5000 mg in 2008). According to regional recommendations for use of the fentanyl transdermal patch in selected patients with a limitation on oral intake and poor compliance, there was also a reduction of 27% in the use of this opiate (5250 µg used in 2007 *vs* 3825 µg in 2008). Details regarding all molecules are reported in Table 4.

Discussion

Measuring quality is a cornerstone of oncologic work, and its rationale has been defined as "the creation of an environment of watchful concern that motivates everyone to perform better"¹⁰. Monitoring performance and providing feedback on performance measures can improve clinical outcomes and quality of care in both palliative and end-of-life settings².

In 2008, 19 (5%) of 364 cancer and treated patients who had died from the disease received an antineoplastic therapy within 14 days prior to death, and 33 (9%) patients were treated within 30 days prior to death. Most of them had a performance status of 2 or more (63.7%), were affected by NSCLC (33.3%), and received a first-line treatment (42.4%).

Our analysis, comparing data from the group of patients who died more than 30 days after receiving their last treatment, could indicate that aggressive cancer care may be offered to patients affected by locally advanced or metastatic NSCLC, with the use of single-agent chemotherapy as first-line therapy in a palliative setting. All patients and family members were motivated to opt for chemotherapy, even though it was explained that the primary purpose of therapy was palliative. We did not perform an analysis of patient and care giver's points of view regarding cancer care near to the end of life.

Our data are similar to those reported in the literature, i.e., assessed as 8-11% of patients who received chemotherapy within 30 days prior to death^{2,11}. Moreover, inadequate communication and symptom management could be associated with aggressive care, and many patients frequently accept more toxicity for a smaller benefit¹². Interestingly, although oncologists limit prognostic information to preserve hope, there has been no evidence that disclosure of prognosis makes parents of children affected by cancer less hopeful¹³.

By introducing use of the palliative prognostic score in our daily clinical practice, we expect to reduce the use of chemotherapy by over 30% and increase the use of hospice and/or palliative home care programs. An annual analysis of the percentage of patients who died from the disease within 14 and 30 days of antineoplastic

Table 1 - Patient characteristics

Type of cancer	No. pts	Age (yr)	Stage	Interval (days)	Died of	Died at – no. pts	PS – no. pts	Treatment line – no. pts	Treatment
NSCLC	11	Median 65 (44-83)	IV	Median 14 (range 2-30)	PD	Hospital: 6 Hospice: 4 Home: 1	1: 4 2: 4 3: 3	1 st : 6 2 nd : 3 3 rd : 1 > 3: 1	Palliative
Breast cancer	4	Median 61 (42-81)	IV	7, 8, 12, 19		Hospital: 2 Hospice: 1 Home: 1	1: 3 3: 1	2 nd : 2 >3: 2	Palliative
SCLC	3	57, 66, 66	IV	6, 15, 25	PD: 2 pts AMI: 1 pt	Hospital: 3	2: 3	1 st : 3	Palliative
Gastric cancer	3	42, 58, 64	IV	7, 20, 24	PD	Hospital: 1 Hospice: 1 Home: 1	1: 2 3: 1	1 st : 2 2 nd : 1	Palliative
Gynecologic cancer	3	59, 64, 78	IV	6, 6, 22	PD	Hospital: 1 Hospice: 1 Home: 1	2: 3	1 st : 1 2 nd : 2	Palliative
UPT	2	49, 58	IV	6, 8	PD	Hospital: 1 Hospice: 1	1: 1 2: 1	3 rd : 1 >3: 1	Palliative
Hodgkin's lymphoma	1	55	IV	13	Toxicity	Hospital: 1	1: 1	3 rd : 1	Palliative
Head & neck cancer	1	68	IV	3	PD	Hospital: 1	2: 1	2 nd : 1	Palliative
Pancreatic cancer	3	68, 69, 74	IV	14, 14, 30	PD	Hospice: 3	1: 1 2: 2	1 st : 2 2 nd : 1	Palliative
Colorectal cancer	1	66	IV	13	PD	Hospital: 1	1: 2	1 st : 1	Palliative
Ocular melanoma	1	62	IV	24	PD	Home: 1	1: 2	1 st : 1	Palliative

Interval, no. of days between last therapy and death. In parenthesis, range; UPT, unknown primary tumor; SCLC, small cell lung cancer; NSCLC, non-small cell lung cancer; PD, progressive disease; AMI: acute myocardial infarction; PS, performance status.

Table 2 - Chemotherapy schedules used in the deceased patients

Type of cancer	Line of treatment – No. pts	Chemotherapy schedule
NSCLC	1 st : 6 2 nd : 3 3 rd : 1 > 3: 1	Navelbine, gemcitabine Pemetrexed, docetaxel Pemetrexed Erlotinib
Breast	2 nd : 2 >3: 2	Capecitabine Weekly paclitaxel, epirubicin
SCLC	1 st : 3	Carboplatin-etoposide
Gastric cancer	1 st : 2 2 nd : 1	Docetaxel-carboplatin-capecitabine (weekly schedule) Capecitabine
Gynecologic cancer	1 st : 1 2 nd : 2	Epirubicin Epirubicin, carboplatin
UPT	3 rd : 1 >3: 1	Erlotinib Capecitabine
Hodgkin's lymphoma	3 rd : 1	Anthracyclin-based chemotherapy
Head & neck	2 nd : 1	Carboplatin-5-fluorouracil
Pancreas	1 st : 2 2 nd : 1	Gemcitabine Capecitabine
Colon	1 st : 1	Oxaliplatin-capecitabine
Ocular melanoma	1 st : 1	Fotemustine

Table 3 - Patients who died from their disease more than 30 days after the last treatment

Cancer	No. of pts	No. of days between last treatment & death
NSCLC	8	Median 61.5 (range, 43-81)
Breast cancer	2	60, 115
SCLC	3	50, 60, 75
Gastric cancer	0	-
Gynecologic cancer	0	-
UPT	0	-
Hodgkin's lymphoma	1	55
Head & neck cancer	1	150
Pancreatic cancer	3	31, 39, 120
Colorectal cancer	6	Median 59.5 (range 35-210)
Ocular melanoma	0	-
Other cancer	7	Median 60 (range 37-210)

Other cancer: renal, soft tissue sarcoma, brain tumor, prostatic.

treatment should be performed and presented to all members of the Operative Unit.

A widespread problem in the treatment of cancer pain remains the risk of undertreating. A survey of symptomatic pain is mandatory but is also necessary to control the correct use and effectiveness of analgesics according to the patient's reported level of pain. We decided to integrate the daily use of pain measurement through the numeric rating scale and adopt Cleeland's pain

Table 4 - Annual consumption of opiates

Drug	2007	2008	Difference (%)
Fentanyl transdermal patch	5250 µg	3825 µg	-1425 µg (-27)
Morphine chlorhydrate vials	4600 mg	5000 mg	+400 mg (+8.6)
Oral morphine prompt release, drops	1600 mg	800 mg	-800 mg (-50)
Oxycodone	7840 mg	25720 mg	+17880 mg (+228)
Oral morphine chlorhydrate prolonged release	2200 mg	-	- 2200 mg (-100)
Oral morphine sulfate prolonged release	1120 mg	-	- 1120 mg (-100)
OROS hydromorphone	-	336 mg	+336 (+100)

management index, evaluating the congruence between the patient's reported level of pain and the intensity of the use of painkillers^{7,8}. This index is constructed on the patient's level of worst pain on the Brief Pain Inventory, defined as 0 (no pain), 1 (1-3, mild pain), 2 (4-7, moderate pain), and 3 (8-10, severe pain). The pain level is subtracted from the most potent level of analgesic drug therapies prescribed, scored as ≥ 0 (no painkiller), 1 (non-opioid), 2 (weak opioid), and 3 (strong opioid). The index can range from -3 (severe pain receiving no analgesic drug) to +3 (a patient receiving strong opioids and reporting no pain). Negative scores indicate inadequate orders for painkillers, and score ≥ 0 is an indicator of acceptable treatment⁸.

Palliative prognostic scores and evaluation of pain and pain management index are two easily applicable tools to improve the quality of care and clinical outcome for cancer patients affected by advanced disease and at end-of-life settings. We believe that any attempt to improve quality of care can be achieved by close collaboration among all health professionals and direct involvement of the patient and the caregivers in establishing and accepting the therapeutic goal in any setting of the neoplastic disease.

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