ORIGINAL ARTICLES CLINICAL ONCOLOGY

Brazilian Journal of Oncology

Real-life data from an oncology infirmary in a Brazilian university-based teaching hospital

Dados da vida real de uma enfermaria de oncologia em um hospital universitário brasileiro

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ABSTRACT

Objective: Analyze data regarding patients in need of hospital care admitted in our oncology infirmary aiming for better clinical practices, clinical support and scope for financial and structural needs for institutions. **Methods:** A prospective study of 191 patients admitted for in-hospital care during a year, who were stratified by diagnosis, age, sex, admission reason, duration of stay, re-admission rate and outcomes. **Results:** 97 male and 94 female patients were admitted, with a 61-year-old mean age; the mean stay was 13,4 days; and a re-admission rate of 9,4%. Main admission causes: terminality [defined by PS-ECOG=4, with a 30 day or less estimated life expectancy]: 30 patients (15,7%); total pain: 23 (12,0%); oncological emergencies [febrile neutropenia, malignant hypercalcemia, medullar compression, superior vena cava syndrome]: 20 (10,4%); clinical deterioration [defined as worsening of patients performance or malnutrition]: 15 (7,8%); abdominal pain [without acute abdomen]: 14 (7,3%). Most common primary tumor sites were: colorectal=30 (15,7%), breast=28 (14,6%), stomach=20 (10,4%), lung=14 (7,3%), ovary=12 (6,2%) and prostate=10 (5,2%). **Results:** 99 deaths (mortality rate 52,1%). Patients in terminality presented a 90% ratio of mortality within an average of 6,6 days of hospital care. Febrile neutropenia (42,8%) and abdominal pain (35,7%) both achieved above expected mortality rates. 91 patients were discharged from the hospital and went back to ambulatory care. **Conclusion:** Our analysis pointed at an admission rate of 1,2%, pointing at good clinical ambulatory practices. The mean in-hospital stay comparison between patients who were discharged and those who died, not considered terminal ill, was unexpectedly similar, 11,7 versus 13,4 days, respectively, suggesting that in-hospital care should be focused on symptoms - not outcomes. Patients with febrile neutropenia and gastrointestinal cancer should be evaluated with caution due to higher than expected mortality rates

Keywords: Hospital cancer care; Supportive care cancer patients; Oncology infirmary; Palliative care; Clinical oncology; Cancer pain.

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RESUMO

Objetivo: Analisar dados relativos a pacientes com necessidade de atendimento hospitalar internados em nossa enfermaria de oncologia visando melhores práticas clínicas, suporte clínico e abrangência das necessidades financeiras e estruturais das instituições. **Métodos:** Estudo prospectivo de 191 pacientes internados para atendimento hospitalar durante um ano, estratificados por diagnóstico, idade, sexo, motivo da internação, tempo de internação, taxa de readmissão e desfechos. **Resultados:** Foram admitidos 97 pacientes do sexo masculino e 94 do feminino, com média de idade de 61 anos; a média de permanência foi de 13,4 dias; e uma taxa de readmissão de 9,4%. Principais causas de internação: terminalidade [definido por PS-ECOG=4, com expectativa de vida estimada de 30 dias ou menos]: 30 pacientes (15,7%); dor total: 23 (12,0%); emergências oncológicas [neutropenia febril, hipercalcemia maligna, compressão medular, síndrome da veia cava superior]: 20 (10,4%); deterioração clínica [definida como piora do desempenho do paciente ou desnutrição]: 15 (7,8%); dor abdominal [sem abdome agudo]: 14 (7,3%). Os locais mais comuns de tumor primário foram: colorretal=30 (15,7%), mama=28 (14,6%), estômago=20 (10,4%), pulmão=14 (7,3%), ovário=12 (6,2%) e próstata=10 (5,2%). **Resultados**: 99 óbitos (taxa de mortalidade 52,1%). Os pacientes em terminalidade apresentaram uma taxa de mortalidade de 90% em uma média de 6,6 dias de atendimento hospitalar. Neutropenia febril (42,8%) e dor abdominal (35,7%) atingiram taxas de mortalidade acima do esperado. 91 pacientes receberam alta hospitalar e retornaram ao ambulatório. **Conclusão:** Nossa análise apontou taxa de internação de 1,2%, apontando boas práticas clínicas ambulatoriais. A comparação do tempo médio de internação hospitalar entre os pacientes que receberam alta e os que morreram, não considerados doentes terminais, foi inesperadamente semelhante, 11,7 versus 13,4 dias, respectivamente, sugerindo que o atendimento intra-hospitalar deve ser focado nos sintomas - não nos resultados. Pacientes com neutropenia febril e câncer gastrointestinal devem ser avaliados com cautela devido às taxas de mortalidade mais altas do que o esperado.

Descritores: Cuidados hospitalares de câncer; Cuidados de suporte a pacientes com câncer; Enfermaria oncológica; Cuidado paliativo; Oncologia clínica; Dor de câncer.

INTRODUCTION

Oncological patients are mostly treated in ambulatory scenarios but may demand in-hospital care and even support at intensive care units (ICU). Little data has been published on the mortality statistics of an oncological cancer infirmary with most studies so far being developed in ICU scenarios.[1] To our knowledge, this information is a key for a better understanding of patient's needs and development of clinical assistance. Our university-teaching hospital is a reference cancer center for metropolitan area of Sorocaba (State of Sao Paulo, Brazil), with 27 nearby cities total population: 2.120.095 habitants, according to official government estimate. The service conducts approximately 15,000 ambulatory consults yearly. After a thorough literature search, we did not find any papers analyzing this matter, reinforcing the importance of this work.

OBJECTIVE

Analyze data regarding patients in need of hospital care admitted in our oncology infirmary aiming better knowledge of clinical support and a real scenario for future financial and structural and professional needs for oncologic institutions.

METHODS

We have designed a prospective study of 190 patients admitted for in-hospital care between 02/02/2018 and 02/28/2019, who were stratified by diagnosis, age, sex, admission reason, duration of stay, re-admission rate, and outcomes. All patients were evaluated, without loss of data. Data was show as absolute and relative numbers.

RESULTS

The one-year-period revealed that 97 male and 93 female patients were admitted, with a 61-year-old mean age. Based on ambulatory consults we pointed an admission rate of 1,2%. The most common primary tumor sites were: colorectal=30 (15,7%), breast=28 (14,6%), stomach=20 (10,4%), lung=14 (7,3%), ovary=12 (6,2%), and prostate=10 (5,2%). These represented more than half of the cases (59,6%), as shown in Table 1. The mean hospital stay was 13,4 days with a re-admission rate of 9,4%.

Table 1. Sites.

Site	Number of cases	% of total
Colon	30	15,7%
Breast	28	14,6%
Stomach	20	10,4%
Lung	14	7,3%
Ovary	12	6,2%
Prostate	10	5,2%
Cervix	9	4,7%
Skin	9	4,7%
Rectum	7	3,6%
Esophagus	6	3,1%
Pancreas	6	3,1%
Oral cavity	6	3,1%
Liver and biliary tract	5	2,6%
Unknown site	5	2,6%
Tongue	4	2,0%
Brain	3	1,5%
Bladder	3	1,5%
Soft tissue	3	1,5%
Kidney	2	1,0%
Other sites*	9	4,7%
Total	191	100%

*Other sites were represented by: pharynx, uterus, penile, thyroid, nasopharynx, tongue, amygdala, testicle, and larynx.

The main admission motives were: terminality [defined by PS-ECOG=4, with a 30 day or less estimated life expectancy]: 30 patients (15,7%); total pain and or overwhelming pain: 23 (12,0%); oncological emergencies [febrile neutropenia, malignant hypercalcemia, medullar compression, superior vena cava syndrome]: 20 (10,4%); clinical deterioration [defined as worsening of patients performance or malnutrition]: 15 (7,8%); abdominal pain [not acute abdomen syndrome]: 14 (7,3%). (Table 2).

Patients outcomes in this period: 99 deaths (mortality rate 52,1%). Patients in terminality presented 93,3% ratio of mortality within an average of 6,6 days of hospital care. Febrile neutropenia (42,8%) and abdominal pain (35,7%) both achieved high mortality rates.

Among all the admissions evaluated, 91 patients had improvement or clinical stability compatible with ambulatory care and were discharged from hospital (Table 3).

DISCUSSION

Providing in-hospital care for oncological patients remains a challenge. In our analysis the in-hospital admission rate of 1,2% points at good quality of clinical ambulatory practices. This should involve not only a well-trained staff but also a comprehensive multidisciplinary care for nutritional and psychological support to these patients, not mentioning an appropriate infrastructure.

Our clinical guidelines are well based on Brazilian and international guidelines such as National Comprehensive

Table 2. Admissions reasons.

Admission reasons	Number of cases	% of total	Mortality in %
Terminality*	30	15,7%	93,3%
Total pain and or overwhelming pain	23	12,0%	60,8%
Oncological emergencies**	20	10,4%	35,0%
Clinical deterioration ***	15	7,8%	53,3%
Febrile neutropenia	14	7,3%	42,8%
Abdominal pain (not acute abdominal syndrome)	14	7,3%	35,7%
Pulmonary or abdominal infection	13	11,5%	36,3%
Bleeding: intestinal, metrorrhagia, urinary	14	7,3%	37,5%
Urinary or cutaneous infection	14	7,3%	25%
Symptomatic anemia	7	3,6%	14,2%
Dyspnea	6	3,1%	66,6%
Ascites and pleural effusion	10	5,2%	50%
Kidney failure	5	2,6%	100%
Jaundice	4	2,0%	75%
Hospital admission for diagnostic purpose	4	2,0%	50%
Hospital admission for chemotherapy	4	2,0%	50%
Hypercalcemia	4	2,0%	25%
Intestinal subocclusion	3	1,5%	33%
Impairment of consciousness level	2	1,0%	100%
Asthenia and adynamia	2	1,0%	50%
Diarrhea	2	1,0%	50%
Hematuria	2	1,0%	50%
Abdominal infection	2	1,0%	50%
Altered mental status	2	1,0%	0%
Dysphagia	2	1,0%	0%
Lower gastrointestinal bleeding	2	1,0%	0%
Metrorrhagia	2	1,0%	0%

*Defined by PS-ECOG=4, with a 30 day or less estimated life expectancy; **Febrile neutropenia, "malignant" hypercalcemia, medullar compression, and superior vena cava syndrome; ***Defined as worsening of patients performance or rapid established malnutrition.

Cancer Network (NCCN), European Society for Medical Oncology (ESMO), Multinational Association of Supportive Care in Cancer (MASCC), and *Academia Nacional de Cuidados Paliativos (ANCP)*. Even though our service does not have a specific palliative-care consultation team, all patients were evaluated and cared for by a well experienced staff of clinical oncologists, not mentioning a multidisciplinary team of nutritionists, physiotherapists, and psychologists. In our analysis, all patients had effective management

comparisons for Brazilian services. Analysis of this group revealed that over half the individuals (N=8) were stage four (IV) metastatic solid tumor patients, namely: gastric, breast, ovary, colon, and sarcoma (Table 4).

"Malignant" hypercalcemia occurred in four patients within the studied period, affecting three female patients with breast cancer, and one male with head and neck cancer. Nonetheless, our mortality rate was at 25% while literature points at 50% death rate within 30 days of diagnosis.[5,6] The single death occurred in a triple-positive breast cancer patient who was also diagnosed with pulmonary embolism during hospital stay and presented rapid clinical deterioration despite all the support. This low incidence of hypercalcemia can be attributed for better controlled risk of hypercalcemia in ambulatory patients.

Both spinal cord compression and superior vena cava syndrome accounted for only one hospital admission each and both patients were eventually discharged from hospital care after clinical support.

Thirty patients were admitted due to clinical deterioration and were considered terminally ill. This group showed an expected mortality rate of 93,3% but a short mean stay period of 6,6 days. The mentioned data points at good clinical evaluation and determination of patients that are brought to in-hospital evaluation by their families or emergency services, pointing to importance of both family and medical education.

A high mortality rate of 53,30% was found on the group of patients who were not terminally ill but were admitted to hospital care due to clinical deterioration, reinforcing that clinical performance play an important role as a prognostic factor in clinical practice. Total pain, a widely known concept first described by Cicely Saunders,[7,8] was the second cause of hospital admission in our study. Patients presented a mortality rate of 60,80%, compatible with the concept of total pain *per se,* since most individuals in this scenario are expected to harbor advanced, highly aggressive, or refractory cancers.[7,8]

The mean stay of 9,4 days for this group was slightly larger when compared with the group admitted in terminality, namely 6,6 days.

Abdominal pain was the sixth cause for hospital admission (7,3% of all in-hospital stays). Mostly these had gastrointestinal cancers and 64,2% presented metastatic disease at admission. Mortality rates within this group - 35,7%. The mean stay for this group was 8,2 days. Multiple variables could play role on these findings, but intestinal occlusion and/or sub-occlusion, hemorrhages, infections, total pain, and ascites were isolated and designed into separate groups. This supports the importance of careful pain evaluation in these patients.

Patient's outcomes during in-hospital stay: excluding patients in terminality, the mean stay comparison between those who showed clinical improvement with hospital discharge and those who died was surprisingly similar - 15,2 versus 13,2 days, respectively. Of important notice is the social and economic burden involved in the care of these patients. Our practice scenario is mostly composed of low-income patients who depend solely on the public health system for all health care, not mentioning that a substantial fraction of them come from nearby smaller cities that very often have poor infrastructure to assist their clinical demands *in loco.*

Table 3. Outcomes.

Outcomes	Number of patients (%)
Deaths in the infirmary - overall	99 (52,1%)
Deaths among terminally ill patients	30 (93,3%)
Deaths among patients with febrile neutropenia	6 (42,8%)
Deaths among patients with abdominal pain	14 (35,7%)
Patients discharged from hospital care	91 (47,9%)
Patients with re-admissions	18 (9,4%)
Mortality within readmission patients	61,1%

Table 4. Febrile neutropenia, tumor sites and patients characteristics.

Primary tumor site	Number of cases	% of total febrile neutropenia cases	Mean age	Mean hospital stay	Mortality rate %
Gastric	5	35,7%	63,6	5,6	40
Breast	4	28,5%	63,5	5,5	25
Ovary	1	7,1%	57	8	discharged
Colon	1	7,1%	49	4	100%
Bladder	1	7,1%	77	3	100%
Lung	1	7,1%	76	10	100%
Soft tissue Sarcoma	1	7,1%	76	17	discharged
Total	14	100,00%	64,78	7,58	42,8%

Adding to this is the lack of hospices and out-of-hospital care facilities, which directly increases the demand of hospitalized care even in cases when out-of-hospital care would be better indicated.

Therefore, our admissions frequently involve social-economic aspects, adding more complexity to the care of these patients.

Analysis of this data, namely the mean in-hospital stay comparison between patients who were discharged and those who died, leads us to the conclusion that in-hospital care is a keystone for the care of patients in terminality or with uncontrolled symptoms.

Summarizing, the main goal of such care should focus on the well-being of these patients and their families, and not only clinical outcomes, as show in Table 3.

This is an observational prospective study evaluating a highly complex multivariable scenario and therefore has its own limitations. The dynamic physiopathology involved in malignant neoplasia, not mentioning its heterogenicity, brings a great challenge for the stratification and statistical analysis of the data. Looking further, we also have important social, cultural, and economic factors that also implicate in patient's prognosis since they influence access to health care, medicines, hygiene, family relations, and ultimately patient's well-being.

Finally, the developed "real-life" picture of our oncology infirmary does not necessarily represent the actual scenario in other Brazilian regions, each with its own set of variables, which can widely vary especially in a continent-sized country as ours.

Despite these limitations, we are hopeful that these data can bring a better understanding of the demands involved in the care of cancer patients that need hospitalization in Brazil. Our next step is to establish an instrument for directions of needs for available palliative care in oncology beds, medications, multidisciplinary staff, and development of more efficient hospice care based on our own local reality.

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