End of life care in children and adolescents with cancer: perspectives from a French pediatric oncology care network

Authors: BLAIS Sophie¹, COHEN-GOGO Sarah², GOUACHE Elodie³, GUERRINI-ROUSSEAU Lea⁴, BRETHON Benoit^{5,6}, RAHAL Ilhem⁷, PETIT Arnaud³, RAIMONDO Graziella^{8,9}, PELLEGRINO Beatrice^{1,6,9}, ORBACH Daniel¹⁰.

Affiliations: ¹Pediatric Department, Poissy Hospital, Poissy, France, ²Division of Hematology and Oncology, Department of Pediatrics, The Hospital for Sick Children, Toronto, Canada, ³Sorbonne University, Department of Pediatric Hematology, Trousseau Hospital (AP-HP), Paris, France, ⁴Gustave Roussy Cancer Center, Department of Pediatric and Adolescent Oncology, Paris-Saclay University, Villejuif, France ⁵Pediatric Hematology Department, Robert Debré Hospital (AP-HP), Paris, France ⁶RIFHOP, Île-de-France Regional Network of Pediatric Hematology-Oncology, Paris, France ⁷Adolescents and young adults Hematology Department, Saint-Louis Hospital (AP-HP), Paris, France, ⁸Department of Pediatric Hematology and oncology, Hôpital d'enfants Margency, Margency, France, ⁹PALIPED, Regional Pediatric Palliative Care Resource Team of Île-de-France, Paris, France, ¹⁰SIREDO Oncology Center (Care, Innovation and Research for Children and AYA with Cancer), PSL Research University, Institut Curie, Paris, France.

Corresponding author: Daniel ORBACH, SIREDO Oncology Center Care – Institut Curie, 26 rue d'Ulm, 75005 Paris, France. Telephone: 0033(0)144324550; fax: 0033(0)153104005; e-mail: daniel.orbach@curie.fr

26 **Words count** for:

27 a) abstract: 224 words

28 b) main text: 2186 words

29 **Number** of tables: 3, Number of figures: 3, and Supplemental files: 0

30 **Running title:** End of life care in pediatric oncology

31 **Key words:** End of life, Pediatric, Adolescent, Advance directives, Cancer

32

33 **Abbreviations key table:**

34	CNS:	Central nervous system
35	DNRO:	Do-not-resuscitate orders
36	HM:	hematological malignancies
37	IDF:	Île-de-France area
38	IV:	intravenous
39	ST:	solid tumors
40		

ABSTRACT

Background: In developed countries, cancer remains the leading cause of pediatric death from illness, after the neonatal period. **Methods:** The objective of this study is to describe the end-of-life care characteristics of children and adolescents with solid tumors (ST) or hematological malignancies (HM) who died from tumor progression, in the Île-de-France area. This is a regional, multicentric, retrospective review of medical files of all children and adolescents with cancer who died over a one-year period. Extensive data from the last three months of life was collected. **Results:** A total of 99 eligible patients died at a median age of 9.8 years (range 0.3-24 years). Most frequent terminal symptoms were pain (n=86), fatigue (n=84), dyspnea (n=49) and anorexia (n=41). Median number of medications per patient was 8 (range, 3-18). Patients required administration of opioids (n=91), oxygen (n=36) and/or sedation (n=61). Decision for palliative care was present in all medical records and do-not-resuscitate orders in 90/99 cases. Symptom prevalence was comparable between children and adolescents with ST and HM. A wish regarding the place of death had been expressed for 64 patients and could be respected in 42 cases. Death occurred in hospital for 75. **Conclusions:** This study represents a large and informative cohort, illustrating current pediatric palliative care approaches in pediatric oncology. End-of-life remains an active period of care requiring coordination of multiple care teams.

Introduction

Each year, over 500 children and adolescents are treated for malignancies in pediatric hematology oncology departments in *Île-de-France* (IDF), the area encompassing Paris, France and its surroundings (12.2 million inhabitants in 2019, including 3.13 million under 20 years old). Although the five-year overall survival rate is 82% for children, adolescents and young adults aged 0 to 24 years with cancer in western European countries, cancers remain the leading cause of death from illness, after the neonatal period. The majority of patients die from tumor progression^{1,2}. Palliative care in pediatrics is an elaborate practice of medicine, as each situation is unique and complex³. A seminal study in pediatric palliative care in oncology by Wolfe et al. has shown that it is a period rich in burdensome symptoms, such as pain, weakness, dyspnea, and anorexia⁴. Several studies have described the care provided to children with cancer in the palliative setting, showing that most of these dying children receive intensive treatments during the terminal phase⁴⁻⁸. Two previous mono or multi-centric studies have already analyzed palliative care trajectories for children and adolescents with cancer in the IDF area^{9,10}, describing that children mostly died in hospital (67-78% of cases). In addition, these studies highlighted the need for optimal coordination between outpatient and inpatient care as well as the need for age-appropriate structures such as ones dedicated to adolescents and young adults. All authors underlie the need for a multidisciplinary team to support patients and their families during this complex palliative phase^{6,7}. These care teams need to be trained in palliative medicine and should ideally be assisted by a resource team. For the IDF area, such a resource team was created in 2010 and was called *PALIPED*. In the IDF area, children and adolescents can receive care in one of five tertiary specialized pediatric oncology centers and one of 24 satellite centers, supported by a healthcare network called RIFHOP (*Réseau Île-de-France hémato oncologie pédiatrique*)¹¹. The RIFHOP is the IDF hematology and oncology pediatric network, launched in 2007. This multidisciplinary care

network aims to improve the quality of care for all children and adolescents with cancer and support their families.

The primary objective of this study was to describe the end-of-life care characteristics of children and adolescents who died from tumor progression in IDF during a 12-month period. Secondary objectives were to compare the care provided at the end of life of various subgroups: children versus adolescents, patients with solid tumors (ST group, including CNS tumors) versus those with hematological malignancies (HM group).

Methods

We performed a non-interventional retrospective study with review of anonymized medical records that were in compliance with the reference methodology MR-004 from the *Commission Nationale de l'Informatique et des Libertés* (CNIL). Institutional review board approval was obtained for the study. Patients were identified through the RIFHOP patient database and by patient lists provided by each pediatric oncology tertiary center. Patients were eligible for the study if they (a) had a cytologically or histologically/histological proven HM or ST malignancy, (b) were younger than 18 years old at the diagnosis of their malignancy, (c) were treated in one of the tertiary pediatric and adolescent hematology and oncology centers in IDF and (d) died as a result of a progressive malignancy between January 1st and December 31st, 2016. “Children” were defined as patients aged 0 to 14 years old and “adolescents” as patients aged 15 years or older at the time of death.

Data was collected by one pediatrician on a standardized case report form, after medical records review. We collected data about clinical history and cancer treatment, care provided during the three last months of life and specifically the last week of life, patterns of physical symptoms ($\geq$ grade 3 CTCAE version 4.0, Common Terminology Criteria for Adverse

Events¹²), treatments received during the last week of life, cause and place of death. We collected data of all treatments included antibiotic prophylaxis.

Data were analyzed with the *BiostaTGV* software. All data was analyzed using descriptive statistical methods and the proportion of patients within each group was compared using the chi-squared or Fisher's exact test, when appropriate. For univariate analysis, a p-value less than 0.05 was considered statistically significant.

Results

Patient selection is detailed in Figure 1. Ten patients were excluded because they did not die from progressive disease, five of which died from treatment-related toxicity. Patients' characteristics and total burden of cancer-directed therapies during initial phases of treatment is described in Table I. In summary, among the 99 patients selected, 79 had a ST diagnosis and 20 were treated for a HM. There were 78 children and 21 adolescents. More than half of deceased patients had a CNS malignancy or a sarcoma diagnosis. Median delay from cancer diagnosis to death was 19 months [range, 1-190] and with a median age at death of 9.8 years [range, 0.3-24]. Ten patients in the adolescent group were over 18 years of age when they died.

Patients displayed frequent severe and/or refractory symptoms during the last week of life that required active interventions, such as pain (n=86), fatigue (n=84), dyspnea (n=49) and anorexia (n=41) (Figure 2). Almost half of patients (48/99) received oral or intravenous chemotherapy during the last month of life (Table II), and 7% of patients were included in an experimental phase I-II clinical trials during this month. Median number of concurrent medications per patient was 8 [range, 3-18] during the last week of life, with a median number of intravenous drugs of 4 [range, 0-11]. Patients needed administration of opioids

(n=91), antibiotics (n=35) and oxygen (n=36) (Table II). Overall, 23% of patients received nutritional support by enteral, parenteral nutrition or both. 40% of patients received a transfusion in the last week of life. For 61 patients (information available for n=94), end-of-life sedation was required (any form of sedation and not only terminal sedation), mainly for refractory pain or severe uncontrollable dyspnea. The drug used was intravenous (IV) midazolam in all instances, combined with IV ketamine in 5 cases. The palliative care context was notified in the medical chart for 100% (99/99) of patients. Do-not-resuscitate orders (DNRO) were found in 90/99 medical records. The intervention of a specific palliative care team had been requested for 24/99 patients at a median time of 21 days before death (range: 2–455 days). Almost two-thirds of the patients (63/99) were cared for in collaboration with a satellite center. In addition, 8 patients were hospitalized or seen as out-patients in follow-up care and rehabilitation centers. Home care nursing was involved for 45/99 patients.

Among the 99 patients, 75 died in hospital, mostly in the tertiary pediatric oncology centers (Figure 3). No patient died in an intensive care unit. Home was the place of death for 24/99 patients. Patients or families had expressed a specific wish regarding the place of death in 65% of cases (children, 63%; adolescents, 71%). Envisioned place of death was most often home (children 80%; adolescents 53%). Those wishes were always fulfilled when the place of death was hospital (n=15). For those who had opted for death to happen at home, only 51% of patients (24/47) saw their wish fulfilled. This last proportion was comparable for the children group (51%) and the adolescent group (50%).

Symptom type and incidence, along with administered treatments were comparable in the two age-defined groups. Adolescents were less likely to carry a central venous line or naso-gastric tube at time of death ($p=0.001$ and $p=0.037$, respectively). Some specificities could be highlighted with regards to end-of-life care characteristics of adolescents versus those of younger patients: 29% of adolescents (versus 4% in children, $p=0.003$) had no device at the

time of death and 20% died in an adult palliative centers (versus 0%, $p=0.001$). End of life characteristics were mostly comparable in the two disease-defined groups, even if patients with HM received significantly more blood products ($p<0.001$) and IV antibiotics ($p=0.023$) than those with ST (Table III).

Discussion

This study described the end-of-life care provided to close to a hundred children and adolescents who died from tumor progression over a year, in the large Ile de France area. We analyzed that for this population, a decision to transition to best supportive/palliative care was documented with precision in the medical records for all patients. The decision not to perform invasive resuscitation measures was documented in 90% of medical records. Even if this data had not been collected in the other historical studies in IDF, this rate is higher than the one reported in the Northern American context by Bradshaw *et al.*^{13,14}. In consequences, anticipation and planning of the expected end-of-life situations makes it possible to avoid transfers to the intensive care unit and eliminate the risk for irrelevant invasive acts when symptoms worsen¹⁵.

Symptoms experienced by patients during the last week of life are numerous and remain burdensome despite multiple attempts at treating. Similar symptom prevalence has been reported in previous different studies^{3,4,9,10}. Refractory pain is still predominant in this patient population despite the frequent use of opioids (95% of patients in our cohort)^{4,7,16,17}. The multiplication of symptomatic treatments may actually impact quality of life and very few pediatric studies show evidence-based benefit from these therapies in advanced end-of-life situations^{3,18,19}.

Sedation was often a necessary measure and was prescribed in two-thirds of the cases, during the terminal phase for severe refractory symptoms. These results were in line with other French

experiences regarding sedation in the context of severe unbearable symptoms that could not be relieved with supportive therapies in a palliative situation^{2,20}. The retrospective nature of this work, performed by medical chart review, did not allow us to accurately collect and evaluate psychological symptoms, which has to be acknowledged as a main limitation of our work.

In this report, the hospital remains the most frequent place of death (75% of patients). This proportion has remained stable since 2002 in Ile-de-France, as demonstrated in previous retrospective studies^{9,10}. We were able to document that wishes regarding the place of death were respected in the majority of cases, but not in a constant manner. Occurrence of severe symptoms, such as respiratory distress, seizures or refractory pain might have led families or patients to change their mind from the initial wish. Even if talking about of the possible place of death may be difficult conversation, advance planning allows better fulfilment of the family and patient's wishes^{21,22}. Along the same lines, and in probable relation with this planning step, we did not record any deaths in intensive care units within this cohort^{9,10,16,23}.

In France, despite the deep implication healthcare networks and the frequent presence of home care in the household, the majority of deaths in pediatric oncology occur in hospital. This is different from what is observed in some other developed countries: 61 to 88% of children dying at home in countries such as The Netherlands, United States of America, and Australia^{7,21,24}. This can be explained by a different societal vision and is highly dependent on the local mapping of healthcare and home care support networks. In addition, this should be analyzed by comparing the variation in the rate of death at home according to the some other French areas²⁰. In the Lyon area, the rate of home death is higher for pediatric oncology patients (65%), possibly in relation with a very dedicated and mobile pediatric palliative care team, a single tertiary center and a lower population density²⁵. In IDF, a similar organization is not currently possible due to the greater population density, a multiplicity of care centers and perhaps the absence of a dedicated pediatric hospice.

The majority of our population was of pediatric age (0-14) and was treated for a solid tumor. Still, the relative presence of an adolescent group, along with a group with hematological malignancies allowed us to compare various aspects of end-of-life care and to show that these populations' characteristics were mostly similar. The fact that adolescents died less frequently in satellite centers in our study can be explained by the complexity of adolescents and young adults end of life management in a general pediatrics unit, without a specific unit and without staff trained to care for this population^{10,26}. This stresses the importance of having units and staff dedicated to adolescents and young adults, including in end-of-life situations^{27,28}.

This study represents a large and informative cohort, illustrating our current harmonized palliative care approaches in pediatric hematology and oncology in Ile de France. The strength of this study is its regional scope and exhaustive approach. Indeed, we had access to detailed data thanks to our strong care network, even though we can regret that this study is a retrospective and regional study, as are most studies in pediatric palliative care²⁹. An important innovative point of the study is the description and the comparison of between different subgroups. An important limitation is that the data in relation to care received in the home was limited in some charts, and we might not have had a completely accurate view of this aspect. Due to the importance of remaining uncontrolled severe symptoms, prospective comparative studies, even on supportive care, including at the end of life, seem necessary to better help patients and families.

Conflicts of Interest: The authors have no conflict of interest to disclose for this work.

Authors' contributions: SB collected the data and performed the statistical analysis displayed in this study. SB, SCG and DO designed the study, wrote and edited the manuscript. All authors reviewed and approved the manuscript.

Acknowledgments: The authors wish to thank the members of RIFHOP and PALIPED networks for their participation. We thank Pr. A Baruchel, Pr. N Boissel, Pr. G Leverger, Dr. D Valteau-Couanet, and M Gioia for their collaboration. The RIFHOP and PALIPED networks are financially supported by the ARS (*Agence Régionale de Santé*) who did not interfere with any part of this work.

References

1. Gatta G, Zigon G, Capocaccia R, et al. Survival of European children and young adults with cancer diagnosed 1995–2002. *Eur J Cancer* 2009; 45: 992–1005.
2. Serinet MO, Michon J, Lefort MC, et al. La sédation en fin de vie chez l'enfant atteint de cancer : concordances avec les recommandations. *Rev Oncol Hématologie Pédiatrique* 2013; 1: 21–31.
3. Snaman J, McCarthy S, Wiener L, et al. Pediatric Palliative Care in Oncology. *J Clin Oncol* 2020; JCO.18.02331.
4. Wolfe J, Grier HE, Klar N, et al. Symptoms and Suffering at the End of Life in Children with Cancer. *N Engl J Med* 2000; 342: 326–333.
5. Hinds PS, Drew D, Oakes LL, et al. End-of-Life Care Preferences of Pediatric Patients With Cancer. *J Clin Oncol* 2005; 23: 9146–9154.
6. Pritchard S, Cuvelier G, Harlos M, et al. Palliative care in adolescents and young adults with cancer. *Cancer* 2011; 117: 2323–2328.
7. Theunissen JMJ, Hoogerbrugge PM, van Achterberg T, et al. Symptoms in the palliative phase of children with cancer. *Pediatr Blood Cancer* 2007; 49: 160–165.
8. Revon-Rivière G, Pauly V, Baumstarck K, et al. High-intensity end-of-life care among children, adolescents, and young adults with cancer who die in the hospital: A population-based study from the French national hospital database. *Cancer*. Epub ahead of print 26 March 2019. DOI: 10.1002/cncr.32035.
9. Petit A, Aerts I, Lobut J, et al. End-of-life in pediatric hemato-oncology. *MT Pediatr* 2009; 12: 127–33.
10. Cohen-Gogo S, Marioni G, Laurent S, et al. End of life care in adolescents and young adults with cancer: Experience of the adolescent unit of the Institut Gustave Roussy. *Eur J Cancer* 2011; 47: 2735–2741.
11. Méar L, Benard L, Calandreau M, et al. Le réseau d'Île-de-France d'hématologie et d'oncologie pédiatrique (RIFHOP) : une structure au service des enfants et des professionnels de santé. *Rev Oncol Hématologie Pédiatrique* 2016; 4: 54–64.
12. CTCAE VERSION 4.0, https://evs.nci.nih.gov/ftp1/CTCAE/CTCAE_4.03_2010-06-14_QuickReference_8.5x11.pdf (2010).
13. Bradshaw G, Hinds PS, Lensing S, et al. Cancer-Related Deaths in Children and Adolescents. *J Palliat Med* 2005; 8: 86–95.
14. Santos KG, Fallat ME. Surgical and Anesthetic Decisions for Children With Terminal Illness. *Semin Pediatr Surg* 2001; 10: 237–242.
15. Baker JN, Kane JR, Rai S, et al. Changes in Medical Care at a Pediatric Oncology Referral Center after Placement of a Do-Not-Resuscitate Order. *J Palliat Med* 2010; 13: 1349–1352.

16. Wolfe J, Orellana L, Ullrich C, et al. Symptoms and Distress in Children With Advanced Cancer: Prospective Patient-Reported Outcomes From the PediQUEST Study. *J Clin Oncol* 2015; 33: 1928–1935.
17. Pritchard M, Burghen E, Srivastava DK, et al. Cancer-Related Symptoms Most Concerning to Parents During the Last Week and Last Day of Their Child’s Life. *PEDIATRICS* 2008; 121: e1301–e1309.
18. Duval M, Wood C. [Treatment of non-painful symptoms in terminally ill children]. *Arch Pediatr Organe Off Soc Francaise Pediatr* 2002; 9: 1173–1178.
19. Munzer M. Transfusion en situation palliative chez l’enfant atteint de maladie maligne. *Transfus Clin Biol* 2010; 17: 353–356.
20. Ravanello A, Desguerre I, Frache S, et al. Fin de vie en services pédiatriques hospitaliers spécialisés : étude nationale. *Arch Pédiatrie* 2017; 24: 231–240.
21. Dussel V, Kreicbergs U, Hilden JM, et al. Looking Beyond Where Children Die: Determinants and Effects of Planning a Child’s Location of Death. *J Pain Symptom Manage* 2009; 37: 33–43.
22. Zadeh S, Pao M, Wiener L. Opening end-of-life discussions: How to introduce Voicing My CHOICES™, an advance care planning guide for adolescents and young adults. *Palliat Support Care* 2015; 13: 591–599.
23. Klopfenstein KJ, Hutchison C, Clark C, et al. Variables influencing end-of-life care in children and adolescents with cancer. *J Pediatr Hematol Oncol* 2001; 23: 481–486.
24. Heath JA, Clarke NE, Donath SM, et al. Symptoms and suffering at the end of life in children with cancer: an Australian perspective. *Med J Aust* 2010; 192: 71–75.
25. Bertrand A, Marcault-Derouard A, Devaux Y, et al. Soins palliatifs pédiatriques et fin de vie d’enfants suivis en onco-hématologie : place de l’hospitalisation à domicile. *Bull Cancer (Paris)* 2018; 105: 771–779.
26. Sawyer SM, Azzopardi PS, Wickremarathne D, et al. The age of adolescence. *Lancet Child Adolesc Health* 2018; 2: 223–228.
27. Stark D, Bielack S, Brugieres L, et al. Teenagers and young adults with cancer in Europe: from national programmes to a European integrated coordinated project. *Eur J Cancer Care (Engl)* 2016; 25: 419–427.
28. Desandes E, Bonnay S, Berger C, et al. Pathways of care for adolescent patients with cancer in France from 2006 to 2007. *Pediatr Blood Cancer* 2012; 58: 924–929.
29. Beretta S, Polastri D, Clerici CA, et al. End of life in children with cancer: Experience at the Pediatric Oncology Department of the Istituto Nazionale Tumori in Milan. *Pediatr Blood Cancer* 2010; 54: 88–91.

LEGENDS

1) Figures titles

Figure 1. Flow chart

Figure 2. Physical symptoms during the last week of life (n=99)

Figure 3. Place of death

2) Tables titles

Table I. Characteristics of the study population (n=99)

Table II. Supportive care characteristics during the last week of life. Data regarding cancer-directed therapy was collected during the last month of life.

Table III. End of life characteristics according to age and disease type

Patients receiving care in a RIFHOP center
who died between January 1st and December 31, 2016
N= 160

RIFHOP: Réseau d'Ile-de-France d'Hématologie Oncologie Pédiatrique; N: number of patients

	Number of patients	
Sex		
Female	44	
Male	55	
Oncological diagnosis		
CNS tumor	36	
Malignant mesenchymal tumor	12	
Acute myeloblastic leukemia	9	
Neuroblastoma	9	
Acute lymphoblastic leukemia	8	
Ewing sarcoma	6	
Osteosarcoma	6	
Malignant germ cell tumor	4	
Wilms tumor	3	
Lymphoma	2	
Other tumors	4	
Shared care in satellite center		
Yes	63	
No	36	
Time between tumor diagnosis and death (months)		
Median	-	19
Range		1-190
Age at death (years)	-	
Median		9.8
Range	-	0.3-24.3
Cancer directed therapies, before last month of life		
Chemotherapy	85	
Median number of lines (range)	-	3 (0-11)
Radiotherapy	64	
High dose chemotherapy with stem cell transplant	27	
Experimental phase I-II clinical trials	50	

Table I. Characteristics of the study population (n=99)

CNS, central nervous system

Delivered therapies	Number of patients	% of patients	Median [range]
<u>During the last month of life</u>			
Palliative chemotherapy	48	48	
Palliative radiotherapy	8	8	
Surgery	4	4	
Inclusion in phase I-II clinical trial	7	7	
<u>During the last week of life</u>			
Total number of drugs	-	-	8 [3-18]
Number of oral drugs			4 [0-10]
Number of intravenous drugs			4 [0-11]
Any subcutaneous treatment	5	5	
Any transcutaneous treatment	28	29	
Opioids	91	95	
Antibiotics	35	37	
Oxygen therapy	36	37	
Nutritional support[#]			
Enteral nutrition	17	18	
Parenteral nutrition	9	9	
Transfusions			
Red blood cells	16	17	
Platelets	22	23	
Sedation	61	65	
Indications*:			
Severe dyspnea	34	55	
Refractory pain	28	46	
Not specified	7	11	

[#]patients could receive both *multiple possible

Table II. Supportive care characteristics during the last week of life. Data regarding cancer-directed therapy was collected during the last month of life.

	Children (n=78)	Adolescents (n=21)	p-value	ST group (n=79)	HM group (n=20)	p-value
Severe main symptoms*(n, %)						
Fatigue	67 (86)	17 (81)	0.73	70 (89)	14 (70)	0.73
Pain	67 (86)	19 (90)	0.73	67 (85)	19 (95)	0.46
Dyspnea	38 (49)	11 (52)	0.96	39 (49)	10 (50)	1
Anorexia	32 (41)	9 (43)	1	36 (46)	5 (25)	0.14
Devices (n, %)						
Central venous access	66 (85)	12 (57)	0.001	64 (81)	14 (70)	0.36
NG or G-tube	16 (20)	0 (0)	0.037	15 (19)	1 (5)	0.29
Received treatments* (n, %)						
Opioids	72 (93)	19 (90)	0.68	71 (91)	20 (100)	0.35
Antibiotics	30 (38)	5 (24)	0.30	20 (25)	15 (75)	0.023
Oxygen	27 (35)	9 (43)	0.66	28 (35)	8 (40)	0.90
Enteral/parenteral nutrition	21 (27)	3 (14)	0.27	19 (24)	5 (25)	1
Red blood cells transfusion	12 (15)	4 (20)	0.74	7 (9)	9 (45)	<0.001
Platelet transfusion	17 (22)	5 (23)	1	5 (6)	17 (85)	<0.001
Sedation	48 (61)	13 (62)	1	47 (63)	14 (70)	0.45
Place of death (n, %)						
Tertiary center	39 (50)	10 (48)	1	39 (50)	10 (50)	1
Satellite hospital	19 (24.5)	2 (9)	0.23	15 (19)	6 (30)	0.36
Home	19 (24.5)	5 (23)	1	20 (20)	4 (20)	0.77
Adult hospice	-	4 (20)	0.001	4 (5)	-	0.58
Pediatric rehabilitation hospital	1 (1)	-	1	1 (1)	-	1

Table III. End of life characteristics according to the age and disease type

Abbreviations: AYA: adolescents and young adults, ST: solid tumors; HM: hematological malignancies n: number of patients. NG: naso-gastric, G: gastric. *during the last week of life