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Patrycja A. Przybylska[1], Anna M. Burak[2], Szymon Gołota[3]

[1]Faculty of Health Sciences, Nicolaus Copernicus University in Torun, Collegium Medicum of Ludwig Rydygier, Bydgoszcz, Poland
[2]Department of Emergency Medicine, Nicolaus Copernicus University in Torun, Collegium Medicum of Ludwig Rydygier, Bydgoszcz, Poland
[3]Department of Clinical Neuropsychology, Nicolaus Copernicus University in Torun, Collegium Medicum of Ludwig Rydygier, Bydgoszcz, Poland

Interventions of Polish Emergency Medical Teams in patients with malignant tumors — a four-year follow-up (2019–2022)

Address for correspondence:
Anna M. Burak, PhD
Department of Emergency Medicine,
Nicolaus Copernicus University in Torun,
Collegium Medicum of Ludwig Rydygier
ul. Jagiellońska 13–15, 85–067,
Bydgoszcz, Poland
e-mail: anna_burak@wp.pl

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ABSTRACT

Introduction. In Poland, interventions of emergency medical teams in patients with malignant tumors represent a small percentage of all interventions. Patients with malignant tumors constitute a diverse group in which the patient may manifest a wide spectrum of symptoms and complaints affecting different systems and organs. The aim of this study was to retrospectively analyze emergency medical team interventions in patients with malignant tumors.

Material and methods. 1174 emergency medical services forms from emergency medical team interventions in patients with malignant tumors from April 2019 to December 2022 in the Kujawsko-Pomorskie voivodship in Poland were analyzed.

Results. In the study group 52% were male. The mean age of the subjects was 66 years (SD = 12.31). The most common symptoms in patients were pathological respiratory murmurs (11.7%), psychomotor disorders (11.3%), hypoxemia (10.3%), dyspnea (9.5%) and pain (5.8%). 40.5% of patients were transported to hospital. A total of 7496 emergency medical procedures were performed, most of them involving physical examination and assessment of the patient's condition. The pharmacotherapy administered most commonly involved analgesics (30.9%), electrolytes (24%) and glucocorticosteroids (20.1%). Seventy-four patients (6.3%) died during EMT intervention.

Conclusions. Emergency medical teams most often provide assistance to patients with malignant tumors of the respiratory and thoracic organs and organs of the digestive system. The majority of oncology patients do not require hospital treatment, but only outpatient care. Therefore, there is a need to regulate and optimize the actions taken by emergency medical teams when intervening in patients with malignant tumors.

Keywords: emergency medical team, malignant tumor, emergencies

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Introduction

There are currently more than 1.3 million people living with cancer in Poland [1]. Forecasts predict that this trend will not change in the coming years. The growing incidence of malignant tumors in the general population is the reason why oncology patients with sudden medical conditions need more frequent interventions from emergency medical teams (EMTs). Emergencies in oncology are highly variable due to the specificity of tumors and may affect various organs. They can also result in permanent injury or death. It is therefore important that EMT members can recognize symptoms and implement effective therapy already at the pre-hospital

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stage. Currently, the aim is for the patient to spend as much time as possible at home during treatment and for necessary treatments to be carried out on an outpatient basis. In emergencies, when saving a life, there is often no time for a thorough analysis of the situation, which is why the most important factors in the procedure are current knowledge about the patient's clinical condition, insight into medical records, and professional experience [2].

Emergency medical teams aim to save lives and health in emergencies, whereas palliative care aims to prevent or alleviate suffering. These are completely different goals, so EMT activities and palliative care can complement each other [3]. The World Health Organization (WHO) points out that specialist palliative care alone cannot meet the increasing patient demand, which requires familiarity with multiple medical disciplines [4]. Sometimes, the patient's family calls the emergency number when they cannot reach the palliative care physician on duty during symptom exacerbations. Emergency medical teams are available 24 hours a day, which is particularly important when help should be provided immediately. In paramedics' opinion, they are called to patients in a terminal state more and more often as a regular part of their daily practice [5].

In Poland, there are no guidelines for paramedics that would facilitate decision-making when intervening in a terminally ill patient. The exception is the Do Not Attempt Resuscitation (DNAR) protocol, but still it raises many ethical dilemmas [6] and fears of possible legal suit [6]. Advance Care Planning (ACP) guidelines for patients who die in Polish hospitals have not been implemented yet either [7].

It is also pointed out that the family's expectations of paramedics during the patient's agonal period and the reason help was called for a person who is approaching the end of their life are not fully known. Further research is necessary to determine the type of practical and emotional support that is necessary in such situations, for the patient and the family [8].

This study aimed to analyze the interventions performed by EMTs in patients with malignant tumors, with a particular focus on data on the most common malignancies encountered in the practice of EMTs, symptoms experienced by patients who are subject to medical intervention, emergency medical procedures undertaken, and pharmacotherapy administered.

Material and methods

A 4-year (from April 2019 to December 2022) retrospective analysis of EMT interventions in cancer patients (CPs) in the Kujawsko-Pomorskie voivodship in Poland was carried out. Anonymized data were obtained from the Voivodeship Ambulance Station. Based on entries in the emergency medical services form (EMSF), a total of 174 864 emergency medical team interventions were recorded in the analyzed period. Of these, only interventions in patients diagnosed with malignant tumors (disease codes according to the ICD-10 classification from C00 to C97) were included in the analysis [9]. Thus, 1174 EMSFs were selected for analysis [10].

The following variables were described using frequency measures such as number and percentage of observations: cancer diagnosis, symptoms found (based on fixed items in the EMSF without taking into account additional information entered in the 'HISTORY TAKING' and 'DESCRIPTION' columns), emergency medical services (EMS) provided and pharmacotherapy administered, method of intervention (home medical care/transport to hospital), and number of deaths. Sex and age differences were verified for each variable. The results were statistically analyzed using the non-parametric Mann-Whitney U test or Kruskal-Wallis test depending on the number of groups compared. The level of statistical significance was assumed as $p < 0.05$. All statistical calculations were performed using STATISTICA 13.3 (TIBCO Software, Palo Alto, California, USA).

The study was carried out based on approval no. KB 15/2023 from the Bioethics Committee at the Nicolas Copernicus University in Toruń, Collegium Medicum in Bydgoszcz.

Results

Over one thousand (1174) EMT CP interventions were recorded (Tab. 1), of which 613 (52.21%) concerned men and 561 (48.78%) concerned women. Both male and female groups can be considered equal ($\chi^2 = 1.14$; $p > 0.05$).

The number of CP interventions was unevenly distributed across age categories. There was a noticeable increase in the number of interventions in patients over 40 years of age. Their peak occurred in patients between 60 and 70 years of age. Overall, the median age of CPs at the time of intervention was 67 years. There was no difference in the age of men and women ($Z = –0.17$; $p > 0.05$).

Cancer diagnosis

Detailed diagnoses of malignant tumors in the study population were grouped into 15 main categories based on the International Classification of Diseases ICD-10 [9] (Tab. 2).

Table 1. Number of emergency medical team interventions in patients with malignant tumors compared to all interventions in 2019–2022

Year	Number of all interventions n = 174 864	Number of interventions in patients with the diagnosis of ICD-10 C00-C97 n = 1174	[%]
IV–XII 2019	36347	**257**	0.71
2020	43561	**273**	0.63
2021	47242	**342**	0.72
2022	47714	**302**	0.63
Total	**174864**	**1174**	**0.67**

Table 2. Number of patients diagnosed with malignant tumors

ICD-10 codes	Name of the group	Females		Males		Total	
		n = 562	[%]	n = 612	[%]	n = 1174	[%]
C00–C14	Malignant tumors of the lip, mouth, and throat	24	4.3	26	4.2	50	4.3
C15–C26	Malignant tumors of the gastrointestinal tract organs	128	22.8	152	24.8	280	23.9
C30–C39	Malignant tumors of the respiratory system and thoracic organs	121	21.6	215	35.1	336	28.6
C40–C41	Malignant tumor of bone and articular cartilage	6	1.1	6	1.0	12	1.0
C43–C44	Melanoma and other malignant skin tumors	12	2.1	6	1.0	18	1.5
C45–C49	Malignant tumors of the mesothelium and soft tissues	4	0.7	2	0.3	6	0.5
C50	Malignant tumors of the breast	67	11.9	1	0.2	68	5.8
C51–C58	Malignant tumors of female genital organs	61	10.7	–	–	61	5.2
C60–C63	Malignant tumors of male genital organs	–	–	38	6.2	38	3.2
C64–C68	Malignant tumors of the urinary tract	14	2.5	28	4.6	42	3.6
C69–C72	Malignant tumors of the eye, brain, and other parts of the central nervous system	23	4.1	41	6.7	64	5.5
C73–C75	Malignant tumors of the thyroid and other endocrine glands	5	0.9	4	0.7	9	0.8
C76–C80	Imprecisely defined and secondary malignant tumors and those of indeterminate location	61	10.9	52	8.5	113	9.6
C81–C96	Malignant tumors, of proven or presumed primary nature, of the lymphoid tissue, hematopoietic system, and related tissues	28	5.0	35	5.7	63	5.4
C97	Malignant tumors with multiple independent locations	8	1.4	6	1.0	14	1.2

Most frequently (n > 100), emergency medical teams intervened in patients diagnosed with C30-C39 (n = 336), C15-C26 (n = 280), and C76-C80 (n = 113). Patients with the most common diagnoses did not differ in age ($H = 0.86$; $p > 0.05$).

Overall, the highest number of EMT interventions was recorded for men diagnosed with C30–C39 (n = 215). The number of interventions in this group was significantly higher than in the group of women with the same diagnosis ($\chi^2 = 13.41$; $p < 0.001$). Moreover, there were obvious differences directly related to patients' sex, such as the absence of C51–C58 diagnoses in the male group and the absence of C60–C63 diagnoses in the female group, as well as a strong prevalence of C50 diagnoses in women ($\chi^2_{\text{Yates correction}} = 39.40$; $p < 0.001$).

Symptoms

A total of 2756 symptoms present in CPs were recorded in EMSFs in the overall summary of all EMT interventions. The most common symptoms (n > 200) were pathological respiratory murmurs (n = 322; 11.7%), psychomotor disorders (n = 311; 11.3%), low oxygen saturation (n = 284; 10.3%), and

Table 3. Symptoms observed during interventions in patients with malignant tumors

Groups of symptoms	Symptoms recorded in EMSFs and their number (n)	Males		Females		Total	
		n	[%]	n	[%]	n	[%]
Respiratory symptoms	Pathological respiratory murmurs (322), low oxygen saturation (284), dyspnea (262), apnea (35)	506	56.03	397	43.97	903	100
Cardiovascular symptoms	Hypotension (137), tachycardia (103), heart rate disorders (96), bradycardia (62), SCA (43), hypertensive crisis (33)	258	54.43	216	45.57	474	100
Gastrointestinal symptoms	Abdominal pain (136), vomiting (105), diarrhea (32), hyperglycemia (29), hypoglycemia (22), lack of peristalsis (6), peritoneal symptoms (4)	161	48.20	173	51.80	334	100
Nervous system symptoms	Seizures (41), paresis (24), aphasia (15), spinal cord injury (1)	49	60.49	32	39.51	81	100
Non-specific symptoms	Psychomotor symptoms (311), pain (160), temperature (138), swelling (96), bleeding (83), fainting (63), injury (51), central and peripheral cyanosis (37), shock (25)	492	51.04	472	48.96	964	100

EMSFs — emergency medical service forms

dyspnea (n = 262; 9.5%). Relatively common symptoms (100 > n < 200) included pain (n = 160; 5.8%), temperature (n = 138; 5%), hypotension (n = 137; 5%), abdominal pain (n = 136; 4.9%), vomiting (n = 105; 3.8%), and tachycardia (n = 103; 3.7%) (Tab. 3).

Most reported symptoms concerned the respiratory system (n = 903). They were reported more frequently in men (n = 506) than in women (n = 397). This difference is statistically significant ($\chi^2 = 6.6$; $p < 0.05$). There was no correlation between the number of remaining symptoms and the patient's sex.

Emergency medical services

Emergency medical services undertaken in patients with malignant tumors during EMT interventions were analyzed on the basis of the fixed elements present in the EMSFs and the ICD-9 codes entered by a paramedic [10].

A total of 30 different EMSs were recorded. First, we analyzed the activities related to assessing the patient's condition and monitoring their vital functions. These activities also included ECG tele-transmission and advice, assistance, and medical consultation (Tab. 4).

Seventeen different EMS were used to assess the patient's condition, and in total, they were performed 7496 times. The most frequent (n > 800) services were monitoring of basic vital functions (n = 1081), physical examination (n = 943), pulse oximetry (n = 923), patient assessment for management, and a decision to undertake or abandon EMS (n = 893). These four most common assessment activities were performed 3840 times in total, which accounts for more than half (51.23%) of all assessment activities undertaken as recorded in the EMSFs.

The activities undertaken by EMTs to assess the condition and monitor vital functions of patients were performed with the same frequency in males and females regardless of age. The exception was the assessment of sanity, which was performed significantly more frequently in men (n = 51) than in women (n = 25) ($\chi^2 = 0.58$; $p < 0.05$).

Next, we analyzed the remaining advanced EMSs undertaken by the EMTs in CPs (Tab. 5). Thirteen different types of emergency procedures were identified from the EMSF records. They were performed a total of 1279 times. The most frequent (n > 200) procedures were obtaining vascular access (n = 206), non-instrumented clearing of the airways (n = 318), and oxygen therapy (n = 206). These three most common emergency procedures were performed in total 1186 times, representing 93% of all emergency procedures undertaken. For these procedures, no difference was found in either age or sex of the patients.

Pharmacotherapy used

The paramedics used a wide range of medication during interventions in CPs affecting the blood and hematopoietic system (anti-hemorrhagic), respiratory system (theophylline), cardiovascular system (diuretics, angiotensin-converting enzyme inhibitors, antiarrhythmics, nitrates), gastrointestinal tract and metabolism (antiemetics, spasmolytics), the central nervous system (opioids, benzodiazepine derivatives, sedatives, centrally acting sympathomimetics, parasympathomimetics), as well as electrolytes, hormones, glucocorticosteroids, and non-steroidal anti-inflammatory/non-opioid analgesics (Tab. 6).

Table 4. Assessment of the condition of patients with malignant tumors

Assessment of the patient's condition	Males (n = 613)		Females (n = 561)		Total (n = 1774)	
	n	[%]	n	[%]	n	[%]
Monitoring of basic vital signs	567	92.49	514	91.62	1081	92.08
Physical medical examination	504	82.21	439	78.25	943	80.32
Pulse oximetry	486	79.82	437	77.89	923	78.62
Patient assessment for management and decision to undertake or abandon EMS	468	76.34	425	75.76	893	76.06
Physical examination	410	66.88	343	61.14	753	64.14
Arterial blood pressure measurement	374	61.01	333	59.36	707	60.22
Temperature measurement	366	59.71	312	55.61	678	57.75
Blood glucose concentration	270	44.04	246	43.85	516	43.95
Neurological examination	247	40.29	200	35.65	447	38.07
Execution and evaluation of ECG records	128	20.88	111	19.78	239	20.36
Mental condition assessment	74	12.07	57	10.16	131	11.15
Heart and vascular system examination	36	5.87	40	7.13	76	6.47
Sanity assessment	51	8.31	25	4.46	76	6.47
Medical advice, assistance, consultation	11	1.79	13	2.32	24	2.04
Tele-transmission of ECG records	3	0.49	2	0.36	5	0.42
Rectal finger examination	1	0.16	2	0.36	3	0.25
Gynecological examination	–	–	1	0.18	1	0.08

ECG — electrocardiography; EMS — emergency medical service

Table 5. Emergency services performed in patients with malignant tumors

Emergency services	Males (n = 613)		Females (n = 561)		Total (n = 1174)	
	n	[%]	n	[%]	n	[%]
Obtaining vascular access	330	53.83	332	59.18	662	56.39
Non-instrumented clearing of the airways	169	27.57	149	26.55	318	27.09
Oxygen therapy	109	17.89	97	17.29	206	17.55
Applying a dressing	7	1.14	17	3.03	24	2.04
Airway suctioning	13	2.12	5	0.89	18	1.53
Mechanical ventilation	8	1.31	6	1.07	14	1.19
Cardiac massage	7	1.14	4	0.71	11	0.94
Intubation	6	0.98	3	0.53	9	0.77
Treatment/dressing of injuries	2	0.33	4	0.71	6	0.51
Treatment of eye injury	0	0.00	4	0.71	4	0.34
Bladder catheter insertion	2	0.33	1	0.18	3	0.25
Obtaining intraosseous access	0	0.00	2	0.36	2	0.17
Insertion of a tube into the stomach for decompression	1	0.16	1	0.18	2	0.17

Drugs most frequently (n > 100) used in CPs were electrolytes in patients with an average age of 66.2; non-steroidal anti-inflammatory drugs and non-steroidal analgesics in patients with a mean age of 66.9; glucocorticosteroids in patients with an average age of 67.3; opioids in patients with a mean age of 64.6. These groups of drugs accounted for 69% of the total pharmacotherapy administered, of which

Table 6. Pharmacotherapy used in patients with malignant tumors

Group of drugs	Males (n = 613)		Females (n = 561)		Total (n = 1174)	
	n	[%]	n	[%]	n	[%]
Electrolytes	136	22.18	146	26.02	282	24.02
Non-steroidal anti-inflammatory agents/Non-opioid analgesics	121	19.74	125	22.28	246	20.95
Glucocorticosteroids	124	20.22	112	19.96	236	20.1
Opioids	59	9.64	58	10.33	117	9.96
Spasmolytics	29	4.73	42	7.48	71	6.05
Benzodiazepines	34	5.55	27	4.81	61	5.19
Sympathomimetics	31	5.06	25	4.45	56	4.77
Anti-emetics	23	3.75	33	5.88	56	4.77
Diuretics	21	3.42	17	3.03	38	3.24
Theophylline	17	2.77	12	2.14	29	2.47
Monosaccharides	7	1.14	15	2.67	22	0.87
Angiotensin-converting enzyme inhibitors	8	1.31	14	2.49	22	0.87
Sedatives	10	1.63	9	1.6	19	1.61
Parasympathomimetics	4	0.65	5	0.89	9	0.77
Anti-hemorrhagics	0	0.00	3	0.53	3	0.25
Antiarrhythmics	1	0.16	1	0.18	2	0.22
Nitrates	1	0.16	0	0.00	1	0.08
Hormones	0	0.00	1	0.18	1	0.08

analgesics accounted for 30.9% of the pharmacotherapy used.

All drugs used were administered equally often to men and women. However, it was observed that in the case of glucocorticoid use, the age of men was significantly higher than that of women ($Z = 2.38$; $p < 0.05$);

Intervention procedure

Emergency medical teams most often provided assistance at patients' homes without transporting them to the hospital (n = 604; 51.4%). The mean age in this group was 66.82 years [median (Me) = 67]. There were fewer interventions in patients who were transported to the hospital after emergency procedures (n = 475; 40.5%). The mean age in this group was 65.82 years (Me = 68). The least frequent interventions were in patients who were provided with assistance and were eligible for hospitalization but did not consent to it (n = 95; 8.1%). The mean age in this group was 66.32 years (Me = 66). There were no age [Kruskal Wallis test coefficient (H) = 0.79; $p > 0.05$] or sex ($\chi 2 = 0.33$; $p > 0.05$) differences in the method of carrying out the intervention.

Deaths

Seventy-four patients (6.3%) died during EMS interventions, and one suicide attempt was recorded. Those deaths occurred during emergency medical procedures undertaken at home or during transport to the hospital. The deaths involved 47 men (4%) and 27 women (2.3%). The frequency of deaths among men and women was at the same level ($\chi^2_{\text{Yates correction}} = 3.57$; $p > 0.05$). However, men who died were significantly older (Me = 70 years) than women (Me = 61 years) ($Z = -3.81$; $p < 0.001$).

Discussion

A relatively small percentage of all EMT interventions (< 1%) concerned patients with malignant tumors. However, the problem of collaboration between emergency medicine and oncology or palliative medicine clinicians is increasingly more and more often discussed in the medical community. This proves that such collaboration is important and necessary. In the available literature, there are no guidelines for paramedics that

would define standards for emergency procedures in patients with malignant tumors. Most publications are addressed to physicians and focus on specialized hospital treatment [11], while the aspect of emergency care in patients treated at home is marginal.

A study by Dobosz et al. [12], which analyzed EMT intervention in two centers, showed that patients with malignant tumors were the smallest group of EMT patients and accounted for 0.79% of all interventions, in the first center and 1.65% in the other. Wierzbik-Strońska et al. [13] obtained an even lower percentage in her study — 0.07%. On the other hand, in Dudzinski's et al. [14] three-year follow-up, which also included the first phase of the Covid-19 pandemic, this percentage ranged from 2.21 to 2.79%. Those data are consistent with the results of our study, where interventions in patients with malignant tumors accounted for an average of 0.67% of all EMT interventions. The largest groups of patients were those with malignant tumors of the respiratory and thoracic organs (28.62%), where significantly more interventions involved men, and those with malignant tumors of the digestive system (23.85%). The largest group of patients was aged between 61 and 70 years. These results are in line with the statistical data of the National Cancer Registry in Poland, according to which most women are diagnosed between 50 and 74 years of age, and men between 55 and 79 years of age [15]. On the other hand, malignant tumors of the lung and bronchi, which were the most common malignant tumors in our study, ranked second in the Polish morbidity statistics according to the National Cancer Register [15].

Wojtanowska-Kaczka [11] analyzed dependencies in the management of oncology patients by primary EMTs (without a doctor) and specialist EMTs (with a doctor). The study shows that the majority of patients received necessary assistance at the scene and were then transported to Emergency Departments: 78.4% by primary EMTs and 52.2% by specialist EMTs [11]. In total, as many as 74% of all interventions ended with patients being transferred to Emergency Departments. Those results differ from the results of this study, where the majority of interventions ended with the patient left at home.

Emergencies in the population of patients with malignant tumors can be directly related to cancer and its treatment, but they can also result from comorbidities. They may occur at any stage of treatment and depend mainly on the location of the tumor and its biological characteristics [16]. Therefore, this patient population is heterogeneous. This is confirmed by the classification of disease diagnoses in our patients according to ICD-10 into up to 15 main categories [9]. The most common symptoms reported by patients were related to the respiratory, nervous, circulatory, and gastrointestinal systems. The most common respiratory disorders wee airway narrowing and pleural effusion [16], which is consistent with the reports from patients in this study, including pathological respiratory murmurs, low oxygen saturation, or dyspnea. In contrast, gastrointestinal emergencies are among the most life-threatening ones [17], including obstruction or perforation of the gastrointestinal tract [2, 16]. Hematological complications and subsequent gastrointestinal, respiratory, or urinary tract bleeding also occur as a result of treatment with cytotoxic agents [16]. Gastrointestinal symptoms in the study population most commonly involved abdominal pain and vomiting. Emergency medical team interventions were also related to bleeding, but the analysis did not include data in which system they occurred.

As a result of severe stress, helplessness, suffering, and anticipation of death, CPs may also develop mental disorders, i.e. depression, severe anxiety with respiratory panic that can even lead to suicide attempts and delirium [18]. Many of these can pose a direct threat to the patient's life. In this study, one suicide attempt was recorded, where the patient deliberately overdosed on painkillers.

At the scene of the intervention, paramedics most often performed activities related to the physical examination of the patient: history and assessment of basic vital functions. Advanced medical rescue procedures were performed less frequently. It can therefore be assumed that most patients required basic medical procedures, which were delivered regardless of the type of malignant tumor.

Wojtanowska-Kaczka [11] study took into account pharmacotherapy types and their frequency in oncology patients. The most commonly administered pharmacotherapy was oxygen therapy, analgesia, glucocorticoids, and crystalloids [11]. Glucocorticosteroids were widely used in patients in the terminal phase of cancer, both for specific and non-specific indications as well as in pain therapy [17]. These results are consistent with this study, where the most commonly used pharmacotherapy were analgesics, i.e. non-steroidal anti-inflammatory drugs, non-opioid analgesics and opioids (30.9%), electrolytes (24.02%), and glucocorticosteroids (20.1 %). Of the analgesics, non-steroidal anti-inflammatory drugs and non-opioid analgesics were used significantly more frequently than opioids, which is consistent with the analgesic ladder. The total number of pharmacotherapy procedures exceeded the number of patients. Thus, it can

be concluded that more than one drug had to be used in some interventions. In a study by Wojtanowska-Kaczka [11], the EMTs without a doctor used pharmacotherapy in 50.2%, whereas those with a doctor in 78.3% of cases. In Dudzinski's study, pharmacotherapy was used in half of the study population [14]. Similar results were obtained in our study, where it was used during more than half of the EMT interventions (61.41%).

The study shows that more men than women died in the course of EMT interventions. The death rate (6%) appears to be quite high, similar to that in the study by Dudzinski et al. [14] (6.6%). Wierzbik-Strońska et al. [13] reported a much lower death rate (0.61%) in her analyses from the year 2018.

Few studies exclusively concerned EMT interventions in patients with malignant tumors. Therefore, it would be advisable to educate paramedics about the management of palliative care patients, decision-making regarding radical rescue procedures, and how to recognize the moment when only a peaceful death should be ensured. Emergency medical teams need protocols that would provide guidance on how to deal with a patient who is in the terminal or agonal stage in the pre-hospital setting. A good solution would also be to give EMTs the possibility of consulting the patient's palliative care physician and providing them with access to medical records and individual treatment plans set up by specialists [5].

In North America, the Improving Palliative Care in the Emergency Medicine program has been introduced to educate Emergency Department staff, including paramedics, about palliative and end-of-life care. This is an innovative project because emergency medicine practitioners are more focused more on life-saving measures than symptomatic relief of disease. A new term has also been introduced in connection with that project — palliative emergency medicine [19]. Given the character of EMT interventions for patients receiving palliative care, it would be worthwhile to launch such a project in Poland.

Limitations of the study

This study had several limitations. The research material in the form of EMSFs was difficult to analyze. The analyzed variables were recorded by EMT members in many ways — from choosing fixed items in the documentation to free-text descriptions. This made it difficult to unambiguously interpret the data. For this reason, we decided to consider only fixed items in the documentation, which may have affected the results of the study.

Conclusions

Cancer patients interventions represent a small proportion of all EMT interventions and most often concern patients aged between 60 and 70 years with malignant tumors of the respiratory and thoracic systems as well as the gastrointestinal system. During interventions, paramedics encounter a wide range of symptoms involving different systems and organs, including most commonly: pathological respiratory murmurs, psychomotor disorders, hypoxemia, dyspnea, and pain. The diversity of symptoms can affect the complexity of EMS. The most common interventions in cancer patients, irrespective of sex, assessing the patient's condition and obtaining vascular access, non-instrumented clearing of the airways, and oxygen therapy, as well as pharmacotherapy for pain, administration of electrolytes and glucocorticosteroids.

The majority of CPs do not require hospital treatment, but only outpatient care. Therefore, there is a need to regulate and optimize EMT interventions in patients with malignant tumors.

Article Information and Declarations

Data availability statement

All data generated or analysed during this study are included in this article. Further enquiries can be directed to the corresponding author.

Ethics

The study was carried out on the basis of the consent no. KB 15/2023 of the Bioethics Committee at the Nicolas Copernicus University in Toruń, Collegium Medicum in Bydgoszcz.

Author contributions

P.A.P.: conception, design, execution and interpretation of the data being published, writing of the article; A.M.B.: design, writing of the article; S.G.: execution and interpretation of the data being published, writing of the article.

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Supplementary material

None.

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