

Quality of out-of-hospital palliative emergency care depends on the expertise of the emergency medical team—a prospective multi-centre analysis

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Abstract

Background The number of palliative care patients who live at home and have non-curable life-threatening diseases is increasing. This is largely a result of modern palliative care techniques (e.g. specialised out-of-hospital palliative medical care services), changes in healthcare policy and the availability of home care services. Accordingly, pre-hospital emergency physicians today are more likely to be involved in out-of-hospital emergency treatment of palliative care patients with advanced disease.

Methods In a prospective multi-centre study, we analysed all palliative emergency care calls during a 24-month period across four emergency services in Germany. Participating pre-hospital emergency physicians were rated according to their expertise in emergency and palliative care as follows—group 1: pre-hospital emergency physicians with high experience in emergency and palliative medical care, group 2: pre-hospital emergency physicians with high experience in emergency medical care but less experience in palliative medical care and

group 3: pre-hospital emergency physicians with low experience in palliative and emergency medical care.

Results During the period of interest, the centres received 361 emergency calls requiring a response to palliative care patients (2.8% of all 12,996 emergency calls). Ten percent of all patients were treated by group 1; 42% were treated by group 2 and 47% were treated by group 3. There was a statistically significant difference in the treatment of palliative care patients (e.g. transfer to hospital, symptom control, end-of-life decision) as a result of the level of expertise of the investigated pre-hospital emergency physicians ($p < 0.01$).

Conclusions In Germany, out-of-hospital emergency medical treatment of palliative care patients depends on the expertise in palliative medical care of the pre-hospital emergency physicians who respond to the call. In our investigation, best out-of-hospital palliative medical care was given by pre-hospital emergency physicians who had significant expertise in palliative and emergency medical care. Our results suggest that it may be necessary to take the core principles of palliative care into consideration when conducting out-of-hospital emergency medical treatment of palliative care patients.

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Background

The purpose of any medical action is not only to prevent death but also to respect a patient's wishes and to take into account the natural limits of human life [1].

Improvements in palliative care may give patients the option of spending their last days of life at home [2].

In the final stages of life, palliative care patients in home-care settings may have to deal with sub-acute and acute conditions [3, 4]. These situations may be associated with psychosocial stress of relatives who act as caregivers and they may result in an emergency medical call. In-hospital treatment that is neither desired by the patient nor acceptable to the care-giving relatives is often the consequence of such an action [5–8]. However, in Germany, this in-hospital treatment as a consequence of the emergency medical call often takes place only because of the inexperience of pre-hospital emergency physicians (EP) with respect to palliative medical care concepts and structures (for instance, specialised out-of-hospital palliative care). In Germany, pre-hospital emergency medical systems are based on an integration of EPs. One element of note is that qualified EPs and paramedics are always on board ambulances together. Such EPs are sometimes better equipped to make decisions than a paramedic, ambulance staffer or emergency medical technician.

In Germany, today's emergency medical training curricula include no palliative medical care topics [9]. Approaches commonly used in the emergency medical system and, in particular, by paramedics often use standardised algorithms [10, 11]. This kind of patient processing is consistent with emergency medical guidelines and requirements. However, to assist palliative care patients who are in an advanced stage of their disease certainly requires a different therapeutic approach, which must follow the principles of palliative care and must respect the wishes of the patients and their care-giving relatives. In the case of patients who are at a severely advanced stage of disease, acting for the good of the patient with respect to ensuring a return to his or her personally defined quality of life is of particular importance both in basic and in emergency medical therapy [2]. In this sense, abstaining from intervention in accordance with the patients' will may also be appropriate. This can also result in "non-action" (for instance, in a cardiac arrest scenario). It is for this reason that the patient's right of self-determination is important, especially in the case of a refusal of medical care [8, 12]. However, only a few EPs are qualified in palliative medical care (about 10%) [own data, not published].

Our investigation is intended to show the importance of palliative medical care competence in the pre-hospital emergency medical care of patients with advanced cancer diseases. Our aim is to describe basic approaches to improve the current situation in Germany.

Materials and methods

We prospectively examined all EP-based emergency cases with so-called palliative emergency situation callouts across four emergency medical services (three ground-based and one helicopter rescue service) over a period of 24 months

(October 2005 to September 2007). Therefore, we integrated those cases that involved palliative care patients with cancer diseases in which no curative therapeutic approach could be applied because of the palliative situation. These contacts were termed "palliative motivated emergency situations". Those palliative care calls were selected out immediately. Furthermore, during the defined period, we retrospectively included all emergency medical contacts across the four emergency medical services in our investigation. For this purpose, we used standardised emergency documents (e.g. DIVI 2003 (MIND 2) EPRO 4.2-4-NDS).

We investigated therapeutically differences of the palliative medical emergency situations consistent with the professional experience of the attending EPs. For this purpose, the EPs who responded to the emergency calls were divided into three groups:

- Group 1: pre-hospital emergency physicians with expertise and clinical experience in palliative medical care and in emergency medical care
- Group 2: pre-hospital emergency physicians with expertise and clinical experience in emergency medicine but not in palliative medical care
- Group 3: pre-hospital emergency physicians with low expertise in palliative medical care and lack clinical experience in emergency medical care

Those EPs who had obtained their German additional qualification in "Palliative Medicine" and "Emergency medicine" by meeting the requirements of the German Federal Medical Association (GFMA) [9] were defined as competent in palliative and emergency medical care. EPs who had acquired the additional qualification in "Emergency medicine" and who had the right to train other EPs under the requirements of the GFMA [9] were defined as competent in emergency medical care. EPs without any training in palliative medical care and those who had acquired the additional qualification in "Emergency medicine" less than a year prior to the study were defined as EPs with lack clinical experience in either medical qualification. The categorisation of the EPs was performed prospectively consistent with instant of palliative motivated emergency care situation (i.e. "at the time of every single emergency application").

The following demographic and descriptive data were gathered:

- Total number of all emergency cases
- Number of palliative medical care motivated cases
- Number of all emergency medicine events with the diagnosis "Patient at an advanced stage of his/her cancer disease"
- Age and gender of patients
- Place of emergency medical care (e.g. home-care, nursing home)

- Cancer diagnosis
- Acute symptoms
- Follow-up care of all patients and especially of patients whose diagnosis was definite and consistent with the three groups that we investigated (e.g. type of clinic and in-hospital assistance)
- Reasons for in-hospital treatment in the three investigated groups
- Expectations of patients and care-giving relatives as to the appropriate type of emergency medical therapy
- On-scene care given by the EPs

The data were evaluated with MS Excel 2003 (Microsoft Inc.) and SPSS 12.0, 2004 (SPSS Inc.). The independence of the data was confirmed using Fisher's exact test. Differences amongst the three defined groups were investigated using the Kruskal–Wallies test and within groups using the analysis of variance test for non-parametric data. The significance level after correction of the p value, where necessary, was determined as $p < 0.05$.

Relevant data protection regulations were followed through anonymisation and coding consistent with the Declaration of Helsinki [13]. Inferences about individuals (patients, care-giving relatives and emergency medical service staff) were not possible. Ethical regulations that govern personal data were observed; a report from the Ethical Commission shows its approval of the present investigation for all subjects.

Results

Over a 24-month period, $N=12,996$, emergency medical contacts were responded to by the four emergency medical services. All cases required emergency medical service.

Preventive services and hoax calls were not included in our investigation. The latter categories accounted for 9.8% of all emergency calls (e.g. palliative situations because of final cardiac, neurological and geriatric diseases and situations). There were no significant differences amongst the various emergency medical services (ground based and air based) with respect to patient care and support. In accordance with our inclusion criterion “advanced cancer patient”, 361 subjects were made a part of our investigation. This corresponded to a total of 2.8% of all evaluated emergency medical service protocols.

Taking into consideration the diagnosis of the EP “patient in an advanced stage of disease” that was made independently of the underlying disease, the number of the patients rose to a total of 3.9% (507 patients) across all emergency services.

In the group of patients that we investigated (patients with an advanced type of cancer disease), the average age was 71 years (range 27–95 years). Two hundred eight patients (57.6%) were male, and 153 were female (42.4%). Two hundred ninety-six patients (81.9%) being cared for at home during the emergency situation, and 65 (18.1%) were in nursing homes. Place of care did not significantly impact the procedures conducted by the EPs, consistent with their expertise. In the palliative medical care motivated emergency situations, 15 different primary cancers and four main symptoms were identified in total, the distribution of which is shown in Table 1. Concerning to their medical experiences, the three groups of EPs are listed in Table 2.

In total, 232 patients from the three groups (64.3% of all palliative medical care motivated emergency services) were hospitalised (66.8% into university medical centres, 15.1% into hospitals of maximum medical care and 18.1% into hospitals of basic medical care). The subsequent care of these patients is shown in Tables 3 and 4. There was no statistically significant difference between EPs of groups 1

Table 1 Cancers and symptoms of the investigated palliative care patients (numbers in total and percentage)

Cancer	Incidence ($N=361$)	Symptoms	Incidence ($N=361$)
Bronchial carcinoma	$n=86$ (23.8%)	Dyspnoea	116 (32.1%)
Breast carcinoma	$n=40$ (11.1%)	Unconsciousness	106 (29.4%)
Prostate carcinoma	$n=37$ (10.2%)	Seizures	62 (17.2%)
Glioblastoma	$n=35$ (9.7%)	Breakthrough pain	17 (4.7%)
Colon/rectum carcinoma	$n=35$ (9.7%)	Other symptoms	56 (16.6%)
Oropharyngeal carcinoma	$n=22$ (6.1%)		
Pancreas carcinoma	$n=12$ (3.4%)		
Stomach carcinoma	$n=10$ (2.8%)		
Renal cell carcinoma	$n=8$ (2.2%)		
Ovarial carcinoma	$n=8$ (2.2%)		
Uterus carcinoma	$n=7$ (1.9%)		
Oesophagus carcinoma	$n=6$ (1.7%)		
CUP (cancer of unknown primary)	$n=1$ (0.3%)		
Other malignant cancer disease	$n=47$ (13.1%)		

Table 2 Three defined pre-hospital emergency physician groups concerning the EPs' clinical experiences in palliative and emergency medical care (numbers in total, percentage and as ratio)

Group	Number of pre-hospital emergency physicians (%)	Number of treated patients (%)	Average number of treated patients per pre-hospital emergency physician (ratio)
Group 1	7 (10.8%)	38 (10.5%)	5.4
Group 2	32 (49.2%)	153 (42.4%)	4.8
Group 3	26 (40.0%)	170 (47.1%)	6.5
Total	65 (100%)	361 (100%)	5.6

and 2 with respect to their hospitalisation procedures ($p>0.05$).

EPs of groups 1 and 2 allowed statistically significantly more patients to have subsequent treatment at home than did EPs from group 3 (42.1% vs. 26.8% vs. 1.8%; $p<0.01$). In other words, EPs who were competent in palliative medical care sent significantly fewer patients to hospital.

As regards the organisation of the subsequent in-hospital care administered by the EPs, significant differences were obvious between the three groups (Table 4). Thus, EPs who were experienced in palliative medical care sent significantly more patients directly to palliative care units than did EPs from both of the other groups ($p<0.01$).

Sixty patients who had first been hospitalised in a clinic by the EP were able to leave following ambulant treatment / intervention, perhaps even on the same day. Accordingly, 172 patients in total (47.6% of all palliative medical care motivated services) were treated in a clinic as in-patients following acute events. In comparison of the three groups, statistically significantly more patients were able to leave the clinic after ambulant treatment on the same day, if they had first been treated by the least skilled EPs (Table 4; $p<0.01$).

Patients who requested at-home therapy without a subsequent hospital admission had their wishes respected by EPs from group 1 significantly more often than by EPs from both of the other groups ($p<0.05$). The reasons for in-hospital treatment of the patients were statistically significant different in the three investigated groups:

EPs from group 1:

- Patients and care-giving relatives who requested in-hospital care

EPs from group 2:

- Patients and care-giving relatives who requested in-hospital care
- Patients after cardiopulmonary resuscitation with “Return of spontaneous circulation” (ROSC)

- Uncertainties of the EPs concerning “end-of-life” care
- EPs from group 3:
- Patients and care-giving relatives who requested in-hospital care
 - Patients after cardiopulmonary resuscitation with ROSC
 - Uncertainties of the EPs concerning “end-of-life” care
 - Legal uncertainties concerning “end-of-life” care and advance directives
 - Missing knowledge of the possibility to integrating an out-of-hospital specialised “palliative care team” (PCT)

All 36 patients who requested in-hospital care were also hospitalised in clinics by the EPs. Despite refusing to be hospitalised, significantly more patients were sent to hospital by EPs of group 3 than by EPs of groups 1 and 2 ($p<0.01$).

For 18 patients (4.9% of all palliative motivated emergency situations), a specialised out-of-hospital PCT was requested by the EP for subsequent patient care. This effort was made for 16 patients by EPs from group 1 and for two patients by EPs in group 2. EPs in group 3 never requested any out-of-hospital palliative care service ($p<0.01$ comparing groups 2 and 3 with group 1).

The following expectations of patients and their care-giving relatives concerning the emergency medical therapy were reported:

- Specialised in-hospital palliative care treatment (e.g. palliative care unit; 9.4%)
- Specialised out-of-hospital palliative care treatment (e.g. integration of a specialised out-of-hospital “palliative care team”; 40.9%)
- Emergency medical treatment in accordance to an advance directive (e.g. no resuscitation, no intensive care treatment; 46.3%)

Table 3 Hospitalisation/subsequent care (numbers in total and percentage)

Care	Total number of events without use of palliative medicine (N=11662)	Palliative emergency situations (N=232)	p value
Intensive care unit	n=1796 (15.4%)	n=31 (13.4%)	ns
Palliative care unit	n=0 (0%)	n=18 (7.8%)	<0.001
General ward	n=8968 (76.9%)	n=123 (53%)	<0.05
Discharge after in-hospital ambulant care (same day)	n=898 (7.7%)	n=60 (25.8%)	<0.01
Total	11,662 (89.7%)	232 (64.3%)	<0.01

Table 4 Hospitalisation/subsequent care with reference to the defined groups (numbers in total and percentage)

Care	Group 1 (percent of all hospitalised patients)	Group 2 (percent of all hospitalised patients)	Group 3 (percent of all hospitalised patients)	<i>p</i> value (group 1/2; 1/3; 2/3)
Intensive care unit	<i>n</i> =0	<i>n</i> =10 (12.3%)	<i>n</i> =21 (15.8%)	<0.05; <0.05; ns
Palliative care unit	<i>n</i> =10 (55.6%)	<i>n</i> =6 (7.4%)	<i>n</i> =2 (1.5%)	<0.01; <0.01; ns
General ward	<i>n</i> =6 (33.3%)	<i>n</i> =60 (74.1%)	<i>n</i> =57 (42.9%)	<0.01; <0.05; <0.01
Discharge after in-hospital ambulant care	<i>n</i> =2 (11.1%)	<i>n</i> =5 (6.2%)	<i>n</i> =53 (39.8%)	ns; <0.01; <0.01
Total	18 (47.4%)	81 (52.9%)	133 (78.2%)	ns; <0.05; <0.05

The following on-scene care given by the EPs could be detected:

- Integration of a specialised out-of-hospital “palliative care team”
- Symptom controlled therapy (e.g. treatment of dyspnoea by using strong opioids, treatment of breakthrough pain by using strong opioids)
- No resuscitation in accordance with an advance directive or a “Do Not Attempt Resuscitation Order” (DNAR Order)

The subdivisions of the emergency medical services corresponded to the subsets of emergency medical service frameworks in Germany that are described in the literature. This is one reason why we consider our data to be representative.

Discussion

During out-of hospital care of palliative care patients in advanced stages of their cancer disease, acute situations are more likely to occur as the patient nears death [3]. This frequently leads to emergency services being called by patients or by their care-giving relatives [4–8, 14]. The incidence of palliative medical care motivated emergency medical requests was 2.8% of all callouts in the present investigation. This suggests that, theoretically, every EP will be confronted at some point with a need to provide pre-hospital care for patients who have advanced cancer diseases. Our numbers are consistent with those cited in previous investigations [5, 6, 8]. If we include all those patients with advanced cancer in addition to those patients diagnosed by EPs with terminal disease of other causes, it is clear that the number of emergency medical services for palliative care patients rises to at least 3.9% of the total callouts and therefore, it is consistent with the number of paediatric emergency physician callouts [15, 16]. If we eliminate resuscitation situations, the proportion of patients in the final stage of their diseases in our study increases to 10% [17]. Furthermore, geriatric patients with very advanced conditions were not included into the present investigation.

The characteristics of emergency medical care callouts in our study and confirmed in other investigations suggest that palliative medical therapeutic approaches (for instance, good control of symptoms preceding unconditional prolongation of the dying process) are also important for EPs and paramedics [8, 14, 17]. Every EP and paramedic may be confronted with such acute situations in an out-of-hospital palliative home-care setting. Therefore, the primary aim in treating patients with incurable advanced progressive cancer disease should be to improve and preserve the best possible quality of life as defined by the patients themselves [18–23].

The primary function of emergency medicine is to save lives and transfer patients to other facilities for subsequent care [24]. This function seems to contradict palliative medical therapeutic approaches. Such medical contradictions become especially apparent given the fact that emergency medicine to date has not taken into account the multi-disciplinary basic principles of palliative medicine. In Germany, palliative medical care topics such as symptom controlled therapy at the end of a patient’s life [9] are missing from emergency medical training curricula (both for emergency physicians and for paramedics). The therapeutic aims of pre-hospital emergency medical treatment are rarely consistent with the wishes of palliative patients and with the wishes of their care-giving relatives. The concept of “dying with dignity” is a theoretical construct that should be taken into account in palliative motivated emergency situations [25–29].

A combination of both medical disciplines to address the most important issues that involve therapy at a patient’s end of life would be desirable to allow physicians to act consistent with the wishes of their patients [1]. Specific curriculum content should include the restricted utilisation of active interventions, for instance, in the handling of acute life-threatening symptoms (for example, acute cancer-related bleeding), symptom-controlled therapy (such as “tracheal rattling”) and cancer pain therapy. It should also address legal questions surrounding the validity of patients’ advance directives and DNAR Order.

The present investigation showed the importance of palliative medical care expertise for EPs. Across all groups, significantly fewer hospitalisations took place when the

patients were treated by EPs from group 1. A significant number of patients, in spite of an EP having been called, were allowed to remain at home as they wished, and they were treated to control symptoms in a manner consistent with their wishes. One element of note is that in Germany, fully qualified EPs are always on board ambulances [17, 30, 31]. Such pre-hospital EPs are sometimes better equipped to make decisions than a paramedic, ambulance staffer or emergency medical technician [17, 32]. In some circumstances, the ambulance staff noticed a DNAR Order [11, 33–35]. There are no clear guidelines or legislation as to what medical staff should do in such situations [12, 17, 36, 37]. This is the primary reason why additional training of all those involved in pre-hospital emergency medicine is urgently required for improved care of patients at the end of their lives.

A further element that may improve out-of-hospital emergency care of palliative care patients in advanced stages of their disease may be the use of specialised professional PCT. PCTs in Germany are so termed if they offer the 24-h availability of specially trained caregivers and physicians. However, in Germany, in spite of existing legal provisions (§37b SGB V: Right to specialised ambulant palliative care; SAPV; this legal provision in Germany is underlined by the recommendation 24 of the Committee of Ministers to the European member states on the organisation of palliative care (adopted by the Committee of Ministers on 12 November 2003 at the 86th meeting of the Minister Deputies Council of Europe): Specialist palliative care should be available for all patients when they need it, at any time and in any situation), the base-level financing of existing out-of-hospital PCT is only partially guaranteed. Besides, the integration of specialised PCTs into emergency medical structures, as is already in place in other European countries, is still exceptional in Germany [38–40]. On the one hand, better integration may be possible from the moment the call goes through to the emergency services. Alternatively, notification could subsequently be provided to the EP undertaking out-of-hospital care of the patient. In acute situations involving palliative care patients at home, the EP should therefore serve not only as a therapist but also as an “intermediary” to an outpatient PCT. Such a structure should allow for either stabilisation or a return to the patient’s previous quality of life at home or else to fulfilment of a patient’s desire to die at home. As was documented by previous investigations, to comply with such a patient’s wish often requires a PCT, especially during the terminal stages of life [40, 41]. As regards the accessibility of outpatient palliative care service, EPs in our study did not know the emergency telephone number of the PCT. They also did not know that a PCT was available 24 h a day. For these reasons, a specialised PCT was requested by the emergency medical team for only 18 patients in total for subsequent out-of-

hospital care [8]. We assume that with PCT, significantly more patients could have remained at home, in accordance with their wishes. For patients who wished to be admitted to hospital, this could have been organised and structured by a PCT, so that even the in-hospital care of the patient could have been carried out consistent with his or her specific requests (possibility of “respite care”).

Accordingly, we propose a rational expansion of outpatient operational professional palliative medical facilities [8, 40]. We recommend that future investigations should be conducted to determine whether palliative home care reduces time spent in hospital wards [42]. Such care should not begin in the acute phase but should instead be provided at an early stage of the disease to make it possible to carry out preventive measures accordingly (for example, preparing for acute situations using defined emergency plans [12]). However, so long as there is no extensive outpatient care for palliative care patients, emergency medical teams must continue to play an important role in the care of these patients and their care-giving relatives.

Another advantage of specialised out-of-hospital palliative care seems to be reducing hospital costs [43]. Furthermore, palliative care consultation is effective to reduce patients’ symptoms and facilitate new treatment orders [43].

Limitations of the study

The palliative motivated emergency situations were evaluated on the basis of the available data from emergency medical service teams. A prompt sheet for interviews was not available. Not all protocols could be included in our investigation, with the result that the number of patients with severely advanced cancer is likely still higher than reported in our study.

Our conclusions are derived in the context of the German emergency medical system and are not applicable to countries which use a “paramedic-based” emergency system. However, compared with paramedics, pre-hospital emergency physicians have substantially greater medical knowledge. This is of particular importance for the decisions that have to be taken on an individual basis in the case of palliative patients who are terminally ill. The problems described here probably exist in the paramedic systems of other countries as well. We recommend better training content in emergency medicine curricula for all members of emergency medical teams (both pre-hospital emergency physicians and paramedics).

Conclusion

Often, emergency medicine and palliative medicine are complementary fields. We observed a non-zero frequency

of palliative medical care motivated emergency callouts in our investigation. We found that the care given to patients was based on the palliative medical competence of the investigated EPs. Besides a lack of a specific experience in palliative medical care, an important role can be played by the fear of malpractice and growing medicolegal quarrels. Therefore, we concluded that it would be advantageous to integrate palliative medical content into today's emergency medical training. This would ensure the provision of appropriate emergency medical care to patients who are at the end of their lives, in accordance with palliative medical principles and consistent with their wishes.

The reason of inappropriate admittance of palliative care patients in an advanced stage of their cancer disease has been identified by the present investigation with the poor experiences of the emergency medical team calls from patients or their care-giving relatives in situations of clinical emergencies. These reasons referred to Germany healthy system issues can be easily extended to many other European countries. For this purpose, in Germany, we recommend the necessity of a cultural integration between training curricula of emergency and those of palliative care about ethical–clinical approach within out-of-hospital emergency situations in terminal patients. Furthermore, we recommend a better use of the available 24-h out-of-hospital palliative medical care services. We suggest that such services should be integrated into patient care from the instant a phone call is processed by the emergency response centres. Cooperation between palliative organisations and emergency medical teams is necessary to effectively implement palliative care in emergency situations.

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