

Submitted: 11.10.2016

Accepted: 26.1.2017

Conflict of interest

None.

DOI: 10.1111/ddg.13236

Dermatological diseases in palliative care patients: a prospective study of 271 patients

Q1

Lenche Neloska¹, Katerina Damevska², Andjelka Kuzmanova¹, Lidija Pavleska¹, Milenko Kostov³, Biljana Petreska Zovic¹

(1) Gerontology Institute "13 November", Skopje, Republic of Macedonia

(2) Department of Dermatology, Medical Faculty, University "Ss Cyrilus and Methodius", Skopje, Republic of Macedonia

(3) Department of Neurosurgery, Medical Faculty, Skopje, Republic of Macedonia

Summary

Background: Numerous risk factors place palliative care patients at an increased risk of skin infections, dermatitis, and pressure sores. Furthermore, worsening of chronic skin disorders can be expected, as well as the development of treatment-induced and malignancy-related dermatoses. The objective of the present study was to investigate the prevalence and treatment of dermatological conditions in patients receiving hospital-based palliative care.

Methods: Two hundred seventy-one palliative patients were enrolled. All assessments were conducted by dermatologists. Skin lesions were classified into seven categories: infections, skin tumors, dermatitis, chronic wounds, nail and hair disorders, pruritus, and other unclassified conditions. Treatment modalities were classified as topical only or systemic.

Results: Overall, 1,267 dermatological conditions were recorded, 49 % of which were hospital-acquired. All patients had at least one dermatological condition, and more than 50 different dermatological disorders were noted. The most common group of skin disorders was dermatitis (18.3 % of all dermatological conditions), followed by nail and hair disorders (17.5 %). Almost 16 % of dermatological conditions were treated systemically.

Conclusions: Dermatological conditions are a common and clinically significant problem for palliative patients. The inclusion of dermatologists in multidisciplinary palliative teams should prove helpful in the management of these patients.

Introduction

Aimed at the prevention and relief of suffering, palliative care is an approach that improves the quality of life of patients and their families facing a life-threatening illness. The primary goal of palliative care in both malignant and non-malignant chronic illnesses is to control physical symptoms and to attend to patient's psychological, social, and spiritual needs [1].

Numerous risk factors place palliative care patients at an increased risk of skin disorders. Malnutrition, incontinence, immobility, impaired immunity, pain, and difficulties in nursing are all associated with skin infections, dermatitis, and

pressure sores [2]. Furthermore, worsening of chronic skin disorders can be expected, as well as the development of new treatment-induced and malignancy-related dermatoses.

The complexity of these patients requires a multidisciplinary approach. However, dermatologists are rarely part of the palliative care team in these settings, and palliative dermatology is a neglected topic in the medical literature. There have been only two studies on the prevalence of skin disorders in palliative care patients [3, 4].

The objective of the present study was to investigate the prevalence and treatment of dermatological conditions (DC) in patients receiving hospital-based palliative care.

Material and method

Study design

A prospective observational study design was used.

Settings

The study was carried out at the Geriatric and Palliative Care Hospital in Skopje, Macedonia. This institution serves a population of 1,200,000, offering geriatric and palliative care, as well as chronic wound care management in an outpatient setting. It is the largest specialized geriatric and palliative hospital in the country, and serves patients in the public health system. Besides patient care, the Geriatric and Palliative Care Hospital is a teaching hospital and training center for pressure ulcers. The hospital employs 31 physicians of various specialties, including two dermatologists.

Inaugurated in 1995, the Palliative Care Unit (PCU) is a specialized health organization created by the Macedonian government in partnership with the Sue Ryder Foundation. At the time of this study, the Palliative Care Unit offered 75 active beds. The majority of palliative patients are adults; however, due to the absence of specialized pediatric palliative care in our country, the hospital also cares for a small number of young patients.

The study design was approved by the Hospital Ethics Committee. Informed consent was waived because of the study's observational nature.

Study population

We included all patients consecutively admitted to the PCU from October 2014 to November 2015. We collected data using a case report form specifically created for this study, recording information about demographics, primary diagnosis, duration of stay, chronic and hospital-acquired dermatological conditions, photos of skin lesions, dermatological treatment and outcome.

All assessments were conducted by a dermatologist experienced in palliative dermatology (LN or AK). A baseline dermatological examination was obtained within 48 hours of admission. All patients were prospectively followed twice a week or when consulted due to concerns by other physicians.

Physical examination included the assessment of patients' skin, genital and oral mucosa, hair and nails; all relevant lesions were photographed. Specific procedures such as taking fungal scrapings or biopsies were performed as indicated.

Skin lesions were classified into seven major categories based on their clinical presentation: infections, skin tumors, dermatitis, chronic wounds, nail and hair disorders, pruri-

tus, and other unclassified conditions. Treatment modalities were classified as topical only or systemic.

Outcomes included discharge or transfer to another care setting, and death. Descriptive statistics were used to describe the study population, with continuous outcomes summarized as mean and range, and categorical outcomes presented as percentage.

Results

Patients

Two hundred and seventy-nine consecutive patients were admitted to the PCU during the 13-month study period. Eight of these patients were not included because of death ($n = 7$) or discharge prior to assessment ($n = 1$), leaving a total of 271 patients in this study. Baseline characteristics are shown in Table 1. Mean age was 51 years (range 13–94 years), with a female predominance (58.3 %). The majority of patients (86.4 %) had a malignant disease, the most common cancer site being the uterus, followed by colon and breast. Dependent on patients' outcome, the mean duration of follow-up was 92 days (2–352).

Dermatological conditions

All 271 palliative patients had at least one dermatological condition (DC); the mean number of DCs per patient was 4.7 (Figure 1). Overall, 1,267 DCs were recorded during follow-up. Nearly half of these conditions (623 or 49 %) were hospital-acquired.

While the vast majority of diagnoses was made on clinical grounds, we did perform 44 KOH examinations and 39 bacterial swabs. Two cases of bullous eruptions required a skin biopsy, and one case of Kaposi's varicelliform eruption required detailed virologic tests. In five cases, the exact diagnosis remained unclear.

More than 50 different dermatological disorders were observed (Table 2). The most common group of skin disorders was dermatitis (18.3 % of all dermatological conditions), followed by nail and hair disorders (17.5 %). Xerosis cutis was the most prevalent cutaneous finding (77.8 %), followed by benign skin tumors (44.6 %), effluvium (38.3 %), pruritus (35.1 %), and intertrigo (26.1 %).

Skin Infections

A total of 190 skin infections were recorded in 91 patients, consisting of 161 fungal, 17 viral, and 12 bacterial infections. Four patients developed serious cellulitis and one patient life-threatening Kaposi's varicelliform eruption. Seventeen skin infections (8.9 % of all skin infections) required systemic treatment.

Table 1 Demographic and baseline characteristics of the study population (n = 271).

	Male n = 113 (41.7 %)	Female n = 158 (58.3 %)	Total
Age, mean (range), years	48 (13–94)	52 (22–78)	51 (13–94)
<i>Type of cancer, n (%)</i>			
– lungs	16 (14.1)	8 (5.0)	24 (8.8)
– breast	0	28 (17.7)	28 (10.3)
– gynecological	0	61 (38.6)	61 (22.5)
– colon, rectum	35 (30.9)	11 (6.9)	46 (16.9)
– urinary tract	11 (9.7)	0	11 (4.1)
– esophagus and stomach	8 (7.1)	3 (1.9)	11 (4.1)
– larynx	9 (7.9)	0	9 (3.3)
– leukemia and lymphoma	0	5 (3.2)	5 (1.8)
– unknown primary origin	5 (4.4)	7 (4.4)	12 (4.4)
– other	13 (11.5)	14 (8.9)	27 (9.9)
– total	97 (85.9)	137 (86.7)	234 (86.4)
<i>Non-malignant diseases, n (%)</i>			
– cerebrovascular disease	4 (3.5)	5 (3.2)	9 (3.3)
– cardiac disease	2 (1.7)	1 (0.6)	3 (1.1)
– multiple sclerosis	2 (1.7)	1 (0.6)	3 (1.1)
– other	8 (7.0)	14 (8.9)	22 (8.1)
– total	16 (14.1)	21 (13.3)	37 (27.4)
<i>Patient outcome, n (%)</i>			
– alive at discharge	7 (6.2)	11 (6.9)	18 (6.6)
– alive	30 (26.5)	45 (28.5)	75 (27.7)
– deceased	76 (67.2)	102 (64.6)	178 (65.6)
Follow-up, mean (range) days	97 (2–352)	111 (4–308)	101 (2–352)

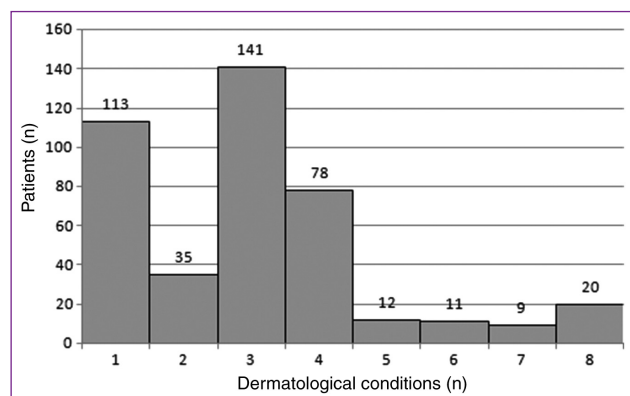


Figure 1 Number of dermatological conditions per patient.

Skin tumors

One hundred ninety-seven skin tumors were registered in 139 patients, the majority (176 or 85 %) being benign proliferations. Cutaneous metastases were found in eight patients (four breast cancers, two colon cancers, one chondrosarcoma, and one lung cancer).

Dermatitis

Various clinical forms and sites of dermatitis were recorded 233 times in 119 (43.9 %) patients. Most cases of diaper dermatitis and intertrigo were hospital-acquired (82.7 % and 78.8 %, respectively), and 39 patients had recurring

Table 2 Dermatological conditions and treatment in 271 palliative patients.

	Patients n (%)*	DC n (%)**	Hospital-acquired n (%)	No treatment n (%)	Topical n (%)	Systemic n (%)
Infections	91 (33.6)	190 (14.9)	149 (78.4)	33 (17.4)	140 (73.7)	17 (8.9)
– candidiasis	52 (19.2)	148 (11.7)	121 (81.7)	17 (11.5)	127 (85.8)	4 (2.7)
– dermatophytosis	3 (1.1)	3 (0.2)	0	1 (33.3)	2 (66.6)	0
– tinea versicolor	10 (3.6)	10 (0.7)	0	9 (90.0)	1 (10.0)	0
– folliculitis, furuncle	5 (1.8)	8 (0.6)	7 (87.5)	2 (25.0)	5 (62.5)	1 (12.5)
– erysipelas/cellulitis	4 (1.4)	4 (0.3)	4 (100)	0	0	4 (100.0)
– zoster/varicella	12 (4.4)	12 (0.9)	12 (100)	2 (16.6)	2 (60.0)	8 (66.6)
– herpes simplex	5 (1.8)	5 (0.4)	5 (100)	2 (40.0)	3 (60.0)	0
Tumors	139 (51.3)	197 (15.5)	0	188 (95.4)	8 (4.1)	1 (0.5)
– benign	121 (44.6)	176 (13.9)	0	174 (98.9)	2 (1.1)	0
– basal cell carcinoma	8 (2.9)	11 (0.9)	0	11 (100.0)	0	0
– melanoma	1 (0.4)	1 (0.1)	0	0	1 (100.0)	0
– skin metastases	8 (2.9)	8 (0.6)	0	2 (1.0)	6 (75)	0
– mycosis fungoides	1 (0.4)	1 (0.1)	0	0	0	1 (100)
Dermatitis	119 (43.9)	233 (18.3)	147 (63.1)	23 (9.9)	184 (78.9)	26 (11.1)
– diaper dermatitis	51 (18.9)	58 (4.6)	48 (82.7)	0	54 (93.1)	4 (6.9)
– intertrigo	71 (26.1)	99 (7.8)	78 (78.8)	0	82 (82.8)	17 (17.1)
– contact dermatitis	6 (2.2)	6 (0.5)	1 (16.6)	1 (16.6)	1 (16.6)	4 (66.7)
– seborrheic dermatitis	48 (17.7)	48 (3.8)	6 (12.5)	17 (35.4)	31 (64.6)	0
– radiation dermatitis	3 (1.1)	3 (0.2)	0	1 (33.3)	2 (66.7)	0
– hand eczema	2 (0.7)	2 (0.2)	0	0	2 (100)	0
– asteatotic eczema	13 (4.8)	17 (1.3)	14 (82.3)	4 (23.5)	12 (70.6)	1 (5.9)
Chronic wounds	54 (19.9)	74 (5.8)	35 (47.3)	0	16 (21.6)	58 (78.3)
– diabetic ulcer	3 (1.1)	4 (0.3)	0	0	0	4 (100)
– venous ulcer	3 (1.1)	4 (0.3)	0	0	0	4 (100)
– pressure sores	38 (14.0)	52 (4.1)	29 (55.8)	0	3 (5.8)	49 (94.2)
– neoplastic ulcer	3 (1.1)	3 (0.2)	0	0	3 (100)	0
– traumatic	7 (2.6)	11 (0.9)	6 (54.5)	0	10 (90.9)	1 (9.1)
Nail and hair	222 (81.9)	222 (17.5)	66 (29.7)	214 (96.4)	8 (3.6)	0
– onychomycosis	57 (21)	57 (4.5)	0	55 (96.5)	2 (3.5)	0
– nail dystrophy	61 (22.5)	61 (4.8)	0	55 (90.1)	6 (9.8)	0
– effluvium	104 (38.3)	104 (8.2)	66 (63.5)	104 (100.0)	0	0
Pruritus	95 (35.1)	95 (7.4)	23 (24.2)	0	5 (5.2)	90 (94.7)
– mixed origin	82 (30.3)	82 (6.4)	21 (25.6)	0	5 (6.1)	77 (93.9)
– cholestasis	10 (3.7)	10 (0.8)	0	0	0	10 (100)
– opioid-induced	3 (1.1)	3 (0.2)	2 (66.7)	0	0	3 (100)

Continued

Table 2 Continued.

	Patients n (%)*	DC n (%)**	Hospital-acquired n (%)	No treatment n (%)	Topical n (%)	Systemic n (%)
Miscellaneous						
– xerosis cutis	211 (77.8)	211 (16.6)	187 (88.6)	28 (13.3)	183 (86.7)	0
– rosacea	7 (2.6)	7 (0.5)	2 (28.6)	5 (71.4)	2 (28.5)	0
– psoriasis	2 (0.7)	2 (0.2)	0	0	2 (100)	0
– dermatitis artefacta	1 (0.4)	1 (0.1)	1 (100)	0	0	1 (100)
– pemphigoid	1 (0.4)	1 (0.1)	1 (100)	0	0	1 (100)
– genital disorders	16 (5.9)	16 (1.2)	5 (31.3)	7 (43.7)	5 (31.2)	4 (25)
– dyspigmentation	6 (2.2)	6 (0.5)	2 (33.3)	6 (100)	0	0
– hand-foot syndrome	1 (0.4)	1 (0.1)	1 (100)	0	1 (100)	0
– oral mucositis	4 (1.4)	4 (0.3)	2 (50)	0	4 (100)	0
– drug rash	2 (0.7)	2 (0.2)	2 (100)	0	0	2 (100)
Unclear diagnosis	5	5 (0.4)	0	4 (80)	1 (20)	0
TOTAL		1267	623 (49.2)	508 (40.1)	559 (44.1)	200 (15.7)
*percentage of total number of patients (n = 271).						
**percentage of total number of dermatological conditions (n = 1,267).						
Abbr.: DC, dermatological condition.						

dermatitis. The majority of cases (78.9 %) were treated topically; however, 11.1 % required systemic treatment.

Chronic wounds

Seventy-four chronic wounds were documented in 54 patients; 78 % were treated systemically. The most common wounds were pressure ulcers (52 in 38 patients), followed by traumatic wounds (11 in 7 patients), and venous ulcers (4 in 3 patients).

Pruritus

Eighty-five (35.1 %) patients had pruritus. The most severe, intractable cases were observed in one patient with cutaneous T-cell lymphoma (Sézary syndrome) and in three patients with cholestasis.

Hair and nail disorders

Hair and nail disorders were observed in 222 (81.9 %) individuals. However, the majority of these conditions (96.4 %) did not require specific treatment.

Miscellaneous

The 'miscellaneous group' in the present study encompassed xerosis cutis (211 patients), genital disorders (16), rosacea

(7), dyspigmentation (6), psoriasis (2), oral mucositis (4), drug rash (2) as well as dermatitis artefacta, pemphigoid, and hand-foot syndrome found in one patient each.

Treatment

Forty-four percent of patients were treated with topical therapy only; emollients were the most frequently applied topical treatment (used in 259 patients) followed by topical corticosteroids (48), wound care treatments (71), and antifungals (41).

Almost 16 % of DCs were treated systemically, the most common being serious skin infections, chronic wounds and pruritus. Antihistamines and corticosteroids were the most commonly used systemic drugs, followed by antivirals and antibiotics.

A total of 508 (40.1%) DCs received no treatment. The majority of benign skin tumors, nail and hair disorders, as well as fungal infections, and seborrheic dermatitis required no specific treatment.

Hospital-acquired dermatological conditions

Almost 50 % of DCs (623/1,267) were hospital-acquired: 88 % of xerosis cutis, 82 % of diaper dermatitis, 78 % of intertrigo, 63 % of effluvium, 56 % of pressure ulcers, and all bacterial and viral infections developed during the hospital stay.

Discussion

The present study is the first large prospective study focusing on dermatological conditions in patients receiving hospital-based palliative care. More than 50 different dermatoses were noted and 1,267 dermatologic conditions were recorded. All patients had at least one DC and 16 % required systemic treatment.

In the past decade, palliative care has become one of the most rapidly growing fields in health care [5]. Estimates suggest that about 3 % of the world's population require palliative or end-of-life care each year [6].

Despite the growing interest in palliative medicine, skin care and skin disorders are rarely discussed, and the literature on dermatological conditions in palliative care settings is remarkably sparse [7]. Only two studies have investigated the prevalence of dermatological diseases in this specific group of patients [3, 4]. Interpretation of these results is limited due to the small number of patients.

Hansra et al. [4] evaluated 20 palliative care patients over a two-month period. Common findings included skin breakdowns (37 %), infections (26 %), inflammatory dermatoses (17 %), and skin conditions related to systemic disease (13 %) or the treatment of systemic disease (7 %). An interesting observation in that study was that most skin conditions were not documented at all or incorrectly documented by palliative care clinicians [4].

Barnabé and Daeninck [3] analyzed 16 patients receiving inpatient palliative care, and concluded that at least one-third of all patients had some cutaneous condition requiring medical or nursing attention.

By contrast, our study found that all palliative patients have at least one dermatological condition, nearly 60 % of which required topical or systemic treatment. The difference in the prevalence of skin disorders between studies might be attributed to the use of different classifications of skin conditions as well as the type of facility. The objective of our study was to document all skin disorders. For this purpose, all assessments were conducted by dermatologists. Finally, the long follow-up in our patients allowed for the documentation of all hospital-acquired DCs.

Numerous factors make the skin particularly susceptible in palliative patients. In 2006, Langemo and Brown coined the term *skin failure* to describe the end-of-life skin changes that coincide with the dysfunction of other organ systems [8].

Palliative patients frequently present with advanced debilitating diseases associated with major organ failure, complex psychosocial issues, diminished self-care abilities, and the challenges of managing pain and other symptoms.

As palliative medicine's primary goal is the reduction of symptoms and suffering, palliative dermatology is primarily focused on conditions causing discomfort (pruritus, xerosis,

intertrigo), impaired dignity (neoplastic ulcerations), or worsening of patients' general condition or prognosis (severe infections, drug reactions). Many patients undergo no diagnostic or therapeutic procedures due to poor general health.

Our study confirmed that pruritus is a common symptom in palliative care patients [9]. The pathogenesis is complex, and its origin is sometimes difficult to determine [10]. Pruritus may be directly related to the malignant disease (paraneoplastic pruritus), indirectly related, or treatment-induced [11]. Severe pruritus is usually associated with cholestasis (hepatic metastasis or biliary duct obstruction), opioids [12], uremia, or hematologic disorders [13]. Xerosis can accompany all of these other causes. Treatment of pruritus requires a pragmatic approach, geared towards symptoms rather than the underlying disease.

Eleven out of 234 patients with malignant diseases (4.7 %) had cutaneous metastases, the most frequent origin being breast, lung, and colon cancer. Our findings are consistent with other studies in which cutaneous metastases were found in 2.5–18 % of patients [14].

Given the special needs with respect to topical and systemic treatment of patients with neoplastic ulcerations [15], we recorded these lesions separately. In our experience, neoplastic ulcerations are the most challenging dermatological conditions in end-of-life patients, not only because of obvious and visible wound-related issues (e. g. pain, bleeding, and exudates) but also due to the psychological impact of a malodorous, necrotic or fungating wound that is ever present to patients and their families.

The prevalence of pressure ulcers in palliative care settings has been shown to range from 10.5–26 % [16–18]. Of the 271 patients examined in our study, 38 (14 %) had one or more pressure ulcers, one-half of which were hospital-acquired despite rigorous preventive protocols. Pressure ulcers significantly increase health care costs [19]. This is particularly relevant in the developing world where resources are limited.

Palliative patients require multiple drugs to control symptoms and to treat concomitant diseases. Polypharmacy increases the risk of adverse drug events, including adverse skin reactions [20]. In our study, effluvium and opioid-induced pruritus were frequently seen. We also observed a case of severe (grade 3) capecitabine-induced palmoplantar erythrodysesthesia. Surprisingly, we observed only two cases of drug rash: one patient with urticaria likely due to analgesics and another with a maculopapular rash likely due to amoxicillin.

Paraneoplastic dermatoses, in the strict sense of the term, were not observed in our series, confirming the rarity of these conditions [21].

Skin disorders had a considerable impact on social and physical functioning as well as quality of life. Addressing dermatological disorders should be part of the dignity-conserving

approach to palliative care, which requires quality of life to be understood from the patient's perspective [22].

The major limitation of the present study is the monocentric study design. Our findings should therefore be validated in a larger, multicenter study. Apart from that, all benign skin tumors and basal cell carcinomas were diagnosed on clinical grounds, which may have led to incorrect diagnoses.

Conclusions

The primary objective of this study was to better understand the dermatological concerns of hospitalized palliative care patients. We found that dermatological conditions were a common and clinically significant problem in this patient group. Early assessment and follow-up of dermatological conditions provides an opportunity for their prevention and treatment. The inclusion of dermatologists in multidisciplinary palliative teams should prove helpful in the management of these patients.

Acknowledgments

The authors wish to express thanks to Dr. Rich Wunderink, Dr. David Larson, and Dr. Andrew Sanders for their enthusiastic encouragement and constructive suggestions.

Correspondence to

Katerina Damevska MD, PhD
 Department of Dermatology
 Medical Faculty
 University "Ss Cyrilius and Methodius"
 Bul.Vodnjanska 31
 Skopje, 1000, Republic of Macedonia
 E-mail: kate_damevska@yahoo.com

References

- 1 Van Mechelen W, Aertgeerts B, De Ceulaer K et al. Defining the palliative care patient: a systematic review. *Palliat Med* 2013; 27(3): 197–208.
- 2 Langemo DK, Brown G. Skin fails too: acute, chronic, and end-stage skin failure. *Adv Skin Wound Care* 2006; 19(4): 206–11.
- 3 Barnabé C, Daeninck P. "Beauty is only skin deep": prevalence of dermatologic disease on a palliative care unit. *J Pain Symptom Manage* 2005; 29(4): 419–22.
- 4 Hansra NK, Berger TG, O'Sullivan P, Chittenden EH. Skin findings in palliative care patients. *J Palliat Med* 2008; 11(6): 834–7.
- 5 Hughes MT, Smith TJ. The growth of palliative care in the United States. *Annu Rev Public Health* 2014; 35: 459–75.
- 6 Singer PA, Bowman K. Quality end-of-life care: a global perspective. *BMC Palliat Care* 2002; 1: 4.
- 7 Strömngren AS, Groenvold M, Pedersen L et al. Does the medical record cover the symptoms experienced by cancer patients receiving palliative care? A comparison of the record and patient self-rating. *J Pain Symptom Manage* 2001; 21(3): 189–96.
- 8 Langemo DK, Brown G. Skin fails too: acute, chronic, and end-stage skin failure. *Adv Skin Wound Care* 2006; 19(4): 206–11.
- 9 Seccareccia D, Gebara N. Pruritus in palliative care: Getting up to scratch. *Canadian Family Physician* 2011; 57(9): 1010–3.
- 10 Xander C, Meerpohl JJ, Galandi D et al. Pharmacological interventions for pruritus in adult palliative care patients. *Cochrane Database Syst Rev*. 2013 Jun 9; 6: CD008320.
- 11 Lidstone V, Thorns A. Pruritus in cancer patients. *Cancer Treat Rev*. 2001; 27(5): 305–12.
- 12 Krajnik M. Opioid-induced pruritus. In: Zyllicz Z, Twycross R, Jones EA (eds.). *Pruritus in advanced disease*. Oxford, UK: Oxford University Press, 2004: 84–96.
- 13 Krajnik M, Zyllicz Z. Pruritus in haematological disorders. In: Zyllicz Z, Twycross R, Jones EA (eds.). *Pruritus in advanced disease*. Oxford, UK: Oxford University Press, 2004: 107–16.
- 14 Alcaraz I, Cerroni L, Rütten A et al. Cutaneous metastases from internal malignancies: a clinicopathologic and immunohistochemical review. *Am J Dermatopathol* 2012; 34(4): 347–93.
- 15 Wilson V. Assessment and management of fungating wounds: a review. *Br J Community Nurs* 2005; 10(3): S28–34.
- 16 Langemo DK, Black J. National Pressure Ulcer Advisory Panel. Pressure ulcers in individuals receiving palliative care: a National Pressure Ulcer Advisory Panel white paper. *Adv Skin Wound Care* 2010; 23(2): 59–72.
- 17 Hendrichova I, Castelli M, Mastroianni C et al. Pressure ulcers in cancer palliative care patients. *Palliat Med* 2010; 24(7): 669–73.
- 18 Galvin J. An audit of pressure ulcer incidence in a palliative care setting. *Int J Palliat Nurs* 2002; 8(5): 214–21.
- 19 Brem H, Maggi J, Nierman D et al. High cost of stage IV pressure ulcers. *Am J Surg* 2010; 200(4): 473–7.
- 20 Reyes-Habito CM, Roh EK. Cutaneous reactions to chemotherapeutic drugs and targeted therapies for cancer: part I. Conventional chemotherapeutic drugs. *J Am Acad Dermatol* 2014; 71: 203.e1.
- 21 Ramos-E-Silva M, Carvalho JC, Carneiro SC. Cutaneous paraneoplasia. *Clin Dermatol* 2011; 29(5): 541–7.
- 22 Chochinov HM. Dignity-conserving care—a new model for palliative care: helping the patient feel valued. *JAMA* 2002; 287(17): 2253–60.

Query/ Note to the author:

Q1: Author: Please confirm that given names (red) and surnames/family names (green) have been identified correctly.