Original Article

Clinical Parameters Associated With Pressure Ulcer Healing in Patients With Advanced Illness

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Abstract

Context. Pressure ulcers are the most prevalent wounds affecting patients with advanced illness. Although complete wound healing is the most desired outcome, it remains unlikely in the setting of patients with limited life expectancy. Realistic goal setting may be enabled using objective clinical parameters.

Objectives. To identify clinical parameters associated with complete healing of Stage II pressure ulcers.

Methods. Univariable and multivariable competing risk analyses were used to assess the association of complete healing with the following six clinical parameters, namely gender, age, total number of pressure ulcers, total number of other wounds, number of failing organ systems, and Palliative Performance Scale (PPS) scores.

Results. A total of 147 patients with 245 Stage II pressure ulcers were followed until death; 9.4% of Stage II pressure ulcers achieved complete healing. Univariable analyses showed hazard ratios (HRs) for complete healing in favor of higher levels of PPS scores (HR 1.82−5.99, $P < 0.001$) and age younger than 80 years (HR 3.28, $P = 0.031$). Multivariable analyses showed HRs for complete healing in favor of higher levels of PPS scores (HR 1.49−3.34, $P = 0.003$).

Conclusion. Higher levels of PPS scores are associated with complete healing of Stage II pressure ulcers in patients with advanced illness. J Pain Symptom Manage 2014;47:1035−1042.

Key Words

Pressure ulcer, advanced illness, palliative care, wound healing, wound management, Palliative Performance Scale

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Introduction

Patients with advanced illness represent the cohort within health care experiencing the highest overall prevalence and incidence of all wound classes.[1−3] A recent prospective study reported

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that almost two-thirds of patients presented with at least one wound and an average of 1.8 wounds per patient on referral to a regional tertiary palliative care program.[1] In addition, patients developed an average of 1.5 wounds between referral and death.[1] The most prevalent wound class is pressure ulcers, affecting about one-fifth of the patients with advanced cancer and about two-thirds of advanced noncancer patients.[1–3]

Wound management espouses multiple goals including wound healing, wound palliation (palliative wound care or wound-related pain and symptom management), and wound prevention (primary and secondary wounds as well as prevention of wound-related complications such as infection).[4–8] Although the prime and most fundamental goal is complete wound healing, this is not always possible, given the limited life expectancy of patients with advanced illness.[4–8] Moreover, goals of wound management change over a patient's lifespan.[4–8] When a patient is young and healthy, wounds have the greatest potential and likelihood to completely heal. However, as a patient becomes increasingly elderly, progresses to advanced illness, and approaches end of life, complete healing becomes less likely. Therefore, realistic goals of care must be formulated and negotiated with the patient, along with the development of appropriate treatment plans.

The ability to more accurately and objectively predict the likelihood of complete healing of a given wound may be useful in the process of formulating realistic goals of care together with appropriate treatment plans. This study aims to look at clinical parameters that are gleaned in a noninvasive manner, at the patient's bedside. Equipped with data pertaining to such clinical parameters, clinicians may have more thorough discussions with patients and/or their substitute decision makers around potential outcomes, goals of care, expectations, and appropriate treatment modalities.

Methods

Study Design

This was a prospective analysis of patients referred to a regional palliative care program in Toronto, Canada. The palliative care program comprises a home consultative service with linkages to a palliative care inpatient unit and an associated hospital-based palliative consultative service. Collectively, the combined community- and hospital-based components serve an estimated population of 750,000 within the northwest quadrant of metropolitan Toronto. Recruitment for this study was commenced with new referrals on May 1, 2005 and ended on June 30, 2006. The study protocol was approved by the research ethics board at the William Osler Health System in Toronto, Canada.

Patients

All patients were referred for consideration of supportive and palliative care. Referrals were received from primary care physicians, oncologists, internists, and surgeons. All patients or their substitute decision makers provided consent to have their clinical data registered in a research database. Patients were followed until their deaths except for a small number who were discharged from the program. The focus of this study was patients with advanced illness, defined as patients who are expected to die within six months of referral. All patients were examined within 24 hours of the initial referral. Data collected were entered in a customized Microsoft Corporation™ Access database by all research collaborators on an accrual basis. Patients were followed by serial clinical assessments throughout their palliative care trajectory, culminating in their death either in the community or the hospital. Performance status was measured at initial referral (baseline) using the Palliative Performance Scale (PPS) Version 2.[9] Risk for the development of pressure ulcers was measured using the Braden Scale.[10] Pressure ulcers were classified according to the system developed by the National Pressure Ulcer Advisory Panel.[11] Given that the data were collected before 2007, the new stage termed "deep tissue injury" was not used. The research team classified pressure ulcers as Stages I, II, III, IV, and unstageable. All wounds were managed by a specialist wound management team consisting of a specialist wound physician and advanced practice nurse and were managed using the fundamentals of the wound bed preparation paradigm as per Falanga,[12] Sibbald et al,[13] and Schultz et al.[14] Thus, all wounds were given treatment with the intent to heal and records were kept of complete healing. In addition,