



Research Article

Risk Factors and Specialist Referral Patterns for Community-Acquired Pressure Injuries in Hospitalized Patients: A Retrospective Analysis from a Tertiary Hospital in Guangdong, China

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Abstract

Aim: To analyze the risk factors associated with community-acquired pressure injuries (CAPIs) in hospitalized patients at a tertiary hospital in Guangdong Province, and to provide evidence for optimizing early-phase risk assessment protocols (from emergency admission to ward transfer) and developing targeted prevention strategies. **Methods:** A retrospective review was conducted on 574 patients with CAPIs reported in the hospital safety management system from June 29, 2024, to May 28, 2026. Patients were categorized into a referral group (n=92) if they were consulted to wound, ostomy, and continence (WOC) nurse specialists, and a non-referral group (n=482) otherwise. Data on demographics, clinical diagnoses, pressure injury characteristics (site and stage), and referral status were collected. Statistical analyses included chi-square tests, independent t-tests, and Mann-Whitney U tests. **Results:** The mean age was approximately 68 years, with a male predominance (64.46%). The sacrococcygeal region was the most frequently affected site (76.48%). Patients in the referral group exhibited significantly higher proportions of Stage III, Stage IV, suspected deep tissue injury, and unstageable pressure injuries compared to the non-referral group ($P < 0.001$). The top three primary diagnoses among the entire cohort were cerebrovascular/neurological disorders (35.02%), pulmonary diseases (20.91%), and malignancies (14.29%). **Conclusion:** CAPIs predominantly affect elderly, male patients, with a predilection for the sacrococcygeal area, and often present with early-stage lesions. However, a substantial subset presents with complex, full-thickness wounds requiring specialist intervention. We recommend establishing standardized referral pathways based on pressure injury staging and comorbidity profiles, alongside enhanced multidisciplinary collaboration, to improve complex wound management outcomes.

Keywords: Community-acquired pressure injuries; Pressure ulcer; Risk factors; Specialist referral; Wound care; Nursing assessment

What does this paper contribute to the wider global clinical community?

It provides contemporary epidemiological data on CAPIs from a large tertiary hospital in China, highlighting demographic and clinical characteristics in this population.

It identifies a critical gap in the utilization of wound specialist resources, emphasizing the need for stage- and comorbidity-based triage protocols.

It offers practical implications for nursing management and resource allocation in acute care settings globally, particularly for early identification and timely referral of high-risk patients.

Introduction

Pressure injuries (PIs) represent one of the most common and challenging complications among elderly patients with prolonged immobility [1]. The pathophysiology involves sustained pressure and shear forces, leading to impaired local blood circulation, tissue ischemia, hypoxia, and subsequent soft tissue necrosis [2]. Reported prevalence rates of PIs vary widely, ranging from 4.5% to 78.4%, with particularly high rates (68.4%-77.6%) in long-term bedridden populations [3,4]. Beyond the physical and psychological distress inflicted on patients, PIs impose a substantial economic burden on families and healthcare systems [5,6].

As the global population ages and survival rates for chronic diseases improve, the proportion of Community-Acquired Pressure Injuries (CAPIs), also known as Pressure Injuries Present on Admission (PIPOA), is rising. This trend presents a growing challenge for acute care settings, as these wounds are often complex and require immediate, specialized attention upon admission [7,8]. Current evidence on the relationship between specific comorbidity patterns and the need for specialist wound consultation in patients with CAPIs is limited. This knowledge gap hinders the development of evidence-based triage protocols and personalized care plans. In response, this study aims to analyze the clinical characteristics and referral patterns of patients with CAPIs in a tertiary hospital, with the goal of informing wound care resource allocation and improving the quality of nursing management for this vulnerable population.

Materials and Methods

Study Design and Sample

This retrospective, observational study utilized data from the hospital safety management system of a tertiary hospital in Guangdong, China. A total of 574 patients with CAPIs were

reported between June 29, 2024, and May 28, 2026. All patients were included in the final analysis. Based on clinical practice, patients were divided into two groups: a referral group (n=92), comprising those whose care involved a consultation from a WOC (Wound, Ostomy, and Continence) nurse specialist, and a non-referral group (n=482), consisting of patients managed by the primary ward nursing team without specialist consultation.

Data Collection

Data were extracted retrospectively from the hospital's standardized reporting database. The variables collected included: patient demographics (age and gender), primary clinical diagnoses, date of admission and PI identification, PI characteristics (location and stage), nursing interventions implemented, and referral status to the WOC nurse specialist. All data points were recorded based on assessments conducted on the day of admission.

Outcome Measures and Definitions

Pressure Injury Staging: PI stages were determined based on the criteria established by the National Pressure Injury Advisory Panel (NPIAP) and consistent with international guidelines [9-11]:
Suspected Deep Tissue Injury (sDTI): Intact or non-intact skin with localized area of persistent non-blanchable deep red, maroon, or purple discoloration, or blood-filled blister.

Stage 1: Intact skin with non-blanchable erythema of a localized area, usually over a bony prominence.

Stage 2: Partial-thickness skin loss with exposed dermis. The wound bed is viable, pink or red, moist, and may also present as an intact or ruptured serum-filled blister.

Stage 3: Full-thickness skin loss, with adipose tissue visible in the ulcer. Granulation tissue and epibole (rolled wound edges) are often present.

Stage 4: Full-thickness skin and tissue loss with exposed or directly palpable fascia, muscle, tendon, ligament, cartilage, or bone in the ulcer.

Unstageable: Full-thickness skin and tissue loss in which the extent of tissue damage within the ulcer cannot be confirmed because it is obscured by slough or eschar.

Referral to WOC Nurse: A formal consultation request placed by the primary medical or nursing team for assessment and management recommendations from a certified WOC nurse specialist.

Statistical Analysis

Statistical analyses were performed using SPSS version 27.0 (IBM Corp., Armonk, NY, USA). Continuous variables (age) were

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assessed for normality and compared between groups using the independent samples t-test. Categorical variables (gender, PI location, PI stage, and clinical diagnosis categories) were compared using the Pearson chi-square test or Fisher's exact test, as appropriate. The Mann-Whitney U test was used for ordinal variables (PI stages). A two-sided P value of <0.05 was considered statistically significant.

Results

General Characteristics of the Study Population

As presented in Table 1, the total cohort of 574 patients had a mean age of 67.89 ± 15.64 years, with no significant difference between the referral and non-referral groups ($P = 0.097$). The majority of patients were male ($n=370$, 64.46%). The sacrococcygeal region was the most common site of injury, accounting for 76.48% ($n=439$) of all cases, followed by the feet/ankles ($n=82$, 14.29%) and buttocks ($n=72$, 12.54%). There were no statistically significant differences in the distribution of PI locations between the two groups ($P = 0.189$).

Characteristic	Referral Group (n=92)	Non-Referral (n=482) Group	Total (n=574)	Test Statistic	P-value
Age (years, mean $\pm$ SD)	65.38 $\pm$ 15.50	68.36 $\pm$ 15.64	67.89 $\pm$ 15.64	t = -1.670	0.097
Gender, n (%)				$\chi^2 = 0.266$	0.606
Male	64 (69.57)	306 (63.49)	370 (64.46)		
Female	28 (30.43)	176 (36.51)	204 (35.54)		
PI Stage, n (%)				$\chi^2=128.837$	<0.001
Suspected Deep Tissue Injury	13 (14.13)	21 (4.36)	34 (5.92)		
Stage 1	10 (10.87)	280 (58.09)	290 (50.52)		
Stage 2	26 (28.26)	138 (28.63)	164 (28.57)		
Stage 3	11 (11.96)	12 (2.49)	23 (4.01)		
Stage 4	3 (3.26)	2 (0.41)	5 (0.87)		
Unstageable	27 (29.35)	21 (4.36)	48 (8.36)		
Not Specified	2 (2.17)	8 (1.66)	10 (1.74)		
PI Location, n (%)				$\chi^2 = 6.143$	0.189
Sacrococcygeal	63 (68.48)	376 (78.01)	439 (76.48)		
Buttocks	20 (21.74)	52 (10.79)	72 (12.54)		
Hip/Trochanter	2 (2.17)	15 (3.11)	17 (2.96)		
Feet/Ankles	19 (20.65)	63 (13.07)	82 (14.29)		
Knees	1 (1.09)	1 (0.21)	2 (0.35)		
Other	16 (17.39)	54 (11.20)	70 (12.20)		

Table 1: Comparison of General Characteristics between Referral and Non-Referral Groups.

Pressure Injury Stage Distribution and Referral Patterns

A significant association was found between PI stage and referral status ($P < 0.001$). The referral group had substantially higher proportions of severe and complex wounds, including Stage III (11.96% vs. 2.49%), Stage IV (3.26% vs. 0.41%), Sdti (14.13% vs. 4.36%), and unstageable PIs (29.35% vs. 4.36%). Conversely, the non-referral group was predominantly comprised of Stage 1 PIs (58.09% vs. 10.87%). These findings suggest that WOC nurse specialists are primarily consulted for more complex, full-thickness, or obscured wounds that require advanced debridement and staging assessment.

Primary Clinical Diagnoses of Patients with CAPIs

The distribution of primary clinical diagnoses between the two groups is detailed in Table 2. The three most frequent diagnoses across the entire cohort were cerebrovascular/neurological disorders (35.02%, $n=201$), pulmonary diseases (20.91%, $n=120$), and malignancies (14.29%, $n=82$). Statistically significant differences between the referral and non-referral groups were observed for pulmonary diseases ($P = 0.010$) and digestive system diseases ($P = 0.006$). Notably, the proportion of patients with digestive system diseases was markedly higher in the referral group (22.83%) compared to the non-referral group (12.03%). This may be attributable to the severe malnutrition and cachexia often accompanying digestive system pathologies, which impair wound healing and necessitate specialist intervention.

Clinical Diagnosis Category	Referral (n=92) n (%)	Non-Referral (n=482) n (%)	Total (n=574) n (%)	χ^2 value	P-value
Postoperative status	2 (2.17)	33 (6.85)	35 (6.10)		
Fracture/Trauma	3 (3.26)	14 (2.90)	17 (2.96)		
Cerebrovascular/Neurological	24 -26.09	177 (36.72)	201 -35.02	3.84	0.05
Pulmonary Diseases	10 -10.87	110 (22.82)	120 -20.91	6.674 0.01	
Malignancies	18 -19.57	64 (13.28)	82 -14.29	2.494	0.114
Cardiovascular Diseases	11 -11.96	71 (14.73)	82 -14.29	0.485	0.486
Digestive System Diseases	21 -22.83	58 (12.03)	79 -13.76	7.582	0.006
Urinary System Diseases	7 (7.61)	26 (5.39)	33 (5.75)	0.699	0.403
Infection/Fever	6 (6.52)	38 (7.88)	44 (7.67)	0.202	0.653
Endocrine/Metabolic	7 (7.61)	46 (9.54)	53 (9.23)	0.345	0.557
Hematological Diseases	1 (1.09)	8 (1.66)	9 (1.57)	0.164	0.685
Other Symptoms/Undiagnosed	8 (8.70)	47 (9.75)	55 (9.58)	0.099	0.753

Table 2: Primary Clinical Diagnoses of Patients with CAPIs by Group.

Discussion

This retrospective study provides a detailed profile of patients admitted with CAPIs to a major tertiary hospital in Guangdong, China, and critically examines the utilization of specialist wound care resources. Our findings corroborate established epidemiological trends, showing that CAPIs predominantly affect older (mean age~68 years), male individuals, which aligns with global data on populations with reduced mobility, sensory deficits, and multimorbidity [12,13]. The sacrococcygeal area was identified as the primary site of injury, reflecting the significant pressure exerted on this region during supine positioning.

A pivotal finding of this study is the distinct separation in clinical complexity between the referral and non-referral groups. The non-referral group was overwhelmingly characterized by Stage I PIs, suggesting that most early-stage, superficial wounds were managed effectively at the ward level. In contrast, the referral group demonstrated a high burden of advanced-stage PIs (Stages III and IV), sDTI, and unstageable wounds. These complex wounds necessitate skilled assessment, including sharp debridement and determination of the true depth of tissue involvement, which falls within the specialized domain of WOC nurses. The high proportion (29.35%) of unstageable PIs in the referral group is particularly concerning, as these wounds obscure the extent of underlying tissue damage, posing a significant risk for deep infection and delayed healing if not promptly and expertly managed.

The analysis of underlying clinical diagnoses revealed important associations that can inform targeted prevention and referral strategies. While cerebrovascular/neurological disorders and pulmonary diseases were highly prevalent overall, patients with digestive system diseases were significantly overrepresented in the referral group. This is clinically plausible, as conditions such as gastrointestinal malignancies or malabsorptive syndromes frequently lead to profound malnutrition, hypoalbuminemia, and cachexia. These systemic states compromise skin integrity, impair the inflammatory and proliferative phases of wound healing, and increase the risk of wound complications, thereby driving the need for specialist consultation [14]. Conversely, the higher proportion of pulmonary disease patients in the non-referral group may indicate that their PIs were predominantly early-stage or related to medical devices (e.g., oxygen tubing, masks) and were adequately addressed by general nursing care.

Implications for Clinical Practice

These findings have several practical implications. First, they underscore the necessity for acute care settings to implement a standardized, stage-based triage protocol for CAPIs upon

admission. Early identification and referral of patients with Stage III/IV, sDTI, and unstageable PIs to WOC specialists can potentially improve outcomes and reduce the length of hospital stays. Second, the association between specific comorbidities (particularly digestive system diseases) and the need for specialist referral highlights the importance of a holistic, multidisciplinary assessment that integrates nutritional status and systemic disease management with wound care [15,16]. Finally, our results suggest a need for ongoing education for ward nurses on the recognition of evolving PIs and the criteria for timely consultation.

Study Limitations and Future Research

Several limitations should be acknowledged. The study's single-center, retrospective design may limit the generalizability of our findings to other settings with different patient populations or healthcare resources. The data were derived from a hospital reporting system, which is subject to potential documentation and reporting biases. Additionally, we did not capture detailed data on important confounders such as Braden Scale scores, nutritional markers (e.g., serum albumin), or specific interventions delivered, which could provide deeper insights into the care process. Future research should employ prospective, multi-center designs to validate the risk factors identified here and to evaluate the clinical impact of implementing standardized referral pathways on patient outcomes, such as wound healing rates and cost-effectiveness. The development of machine learning-based clinical decision support tools to predict which patients with CAPIs will benefit most from specialist referral represents a promising avenue for advancing wound care.

Conclusion

CAPIs in hospitalized patients exhibit distinct clinical patterns, predominantly affecting elderly, male patients and frequently involving the sacrococcygeal region. While the majority of these injuries are at early, reversible stages, a substantial proportion are complex and require timely WOC nurse specialist input. Effective management hinges on the implementation of stage- and comorbidity-based referral criteria, fostering strong multidisciplinary collaboration, and providing comprehensive staff education on PI prevention and management. By refining these pathways, healthcare institutions can better allocate wound care resources, reduce avoidable complications, and ultimately improve the quality of life for this vulnerable patient population.

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