



Retrospective Study of Decubitus Ulcer in Hospitalized Patients

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ABSTRACT

Background: Decubitus ulcer is an area of necrotic tissue due to compression of protrusion because of prolonged immobilization. Decubitus ulcer is complication that often occur due to prolonged bed rest. Decubitus ulcer can interfere with patient's recovery process and prolonged hospital stay. **Purpose:** To investigate profile of decubitus ulcer in hospitalized patients in Dr. Moewardi General Hospital Surakarta during 2017- 2020. **Methods:** This descriptive retrospective study was conducted by using medical record of decubitus ulcers (ICD 10 L89.0, L89.1, L89.2, L89.3) in Dr. Moewardi General Hospital Surakarta during 1st January 2017-31st December 2020. **Result:** There were 375 decubitus ulcer patients, mostly aged 70 years or more (29.1%) and dominated by women (56%). Patients with decubitus ulcers often hospitalized in the regular ward (75.2%) with the longest length of stay being around 0-10 days (49.6%) and the most common comorbidities was malignancy (20.5%). Systemic antibiotic ceftriaxone was most often given to decubitus ulcer patients (21.6%). Most of the patients with decubitus ulcers had stage 2 decubitus ulcers (53.6%) with a predisposition to the affected area being the sacrum area (33%). The most frequently used therapy for decubitus ulcers was hydrogel dressing (33.9%). **Conclusion:** Decubitus ulcers are often found in patients over 70 years of age with comorbid malignancies. The most common diagnosis was stage 2 decubitus ulcers, predisposing to the sacral region and the most frequently used therapy was hydrogel dressing with ceftriaxone as a systemic antibiotic.

Keywords: decubitus ulcer, dressing, pressure injury, pressure ulcers, health, quality education.

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| Article info |

Submitted: 28-6-2022, Accepted: 25-2-23, Published: 31-3-2023

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BACKGROUND

Decubitus ulcers are wounds along with necrosis due to long-term pressure on bony prominences and the external surface of an object. Decubitus ulcers often occur in patients with impaired mobility or prolonged bed rest due to chronic diseases such as stroke, fracture, spinal cord injury, pneumonia, degenerative diseases and malignancies. Decubitus ulcers are one of the health problems with high morbidity and mortality rates.¹ Al Mutairi et al reported the prevalence of decubitus ulcers worldwide was estimated at 14.8% of cases of all hospitalized patients.² Incidence of decubitus ulcers in Switzerland and Norway was reported as 14.9% and 18.2% respectively while Amir et al stated as many as 44% of patients with decubitus ulcers in Indonesia occurred before the patient was hospitalized.^{3,4}

Severity of decubitus ulcers is divided into 4 stages, namely stage 1 (nonblanchable erythema) if the depth of the ulcer is up to the epidermis layer, stage 2 (partial thickness skin loss) if the ulcer depth is up to

the dermis layer, and stage 3 (full thickness skin loss) if the ulcer is deep into subcutis tissue and stage 4 (full thickness tissue loss) if the ulcer is deep to muscle or bone. Diagnosis of pressure ulcers made clinically by knowing the depth of the ulcer layer. Decubitus ulcers can interfere with the wound healing process, often accompanied by secondary infection and severe pain which will prolong treatment time and worsen the patient's prognosis. Impacts caused by decubitus ulcer include a decrease in quality of life of patients psychologically, physically and socially.^{1,2} Management of decubitus ulcers is still being developed because up to now there is no main therapy to prevent and accelerate the healing of decubitus ulcers with satisfactory results. The main treatment aims to reduce pressure on the ulcer, systemic antibiotics if there is a severe secondary infection, wound care using topical agents, debridement and surgical intervention if needed, without a combination of topical antibiotics.⁵ Systemic antibiotics that are often used are penicillins, cephalosporins, aminoglycosides, macrolides and

quinolones. Debridement is the removal of necrotic tissue using gauze, tweezers, scissors, a scalpel or other instrument. Debridement is important to do to provide good vascularization of the ulcer so that it can accelerate the healing process.⁶

The purpose of this study is to report the profile of decubitus ulcer patients in the Inpatient Installation of RSUD Dr. Moewardi Surakarta during 1st January 2017- 31st December 2020, in order to provide an overview to related parties such as doctors, nurses and hospital management to improve the quality of service and care for long bed rest patients.

METHODS

This research was conducted in a retrospective descriptive manner at the Inpatient Installation of RSUD Dr. Moewardi Surakarta during 1st January 2017– 31st December 2020. Data obtained from medical records of all patients with a decubitus ulcer diagnosis at the Inpatient Installation of RSUD Dr. Moewardi Surakarta. Research data variables were age, gender, education level, occupation, treatment room, length of treatment, degree and location of decubitus ulcers, comorbid diseases, local therapy and systemic antibiotics used. The inclusion criteria for the study were patients with a decubitus ulcer diagnosis based on the International Classification of Disease revision-10 (ICD-10) accompanied by the severity of the disease. Exclusion criteria is incomplete medical record data. Data analyzed and included in the table of characteristics of the research subjects and the table of diagnosis and management of decubitus ulcers. This research has been reviewed by the Ethics Committee at General Regional Hospital Dr. Moewardi Surakarta number 751/VIII/HREC/2021.

RESULT

The results of the study at the Inpatient Installation of RSUD Dr. Moewardi Surakarta during 1st January 2017-31st December 2020 there were 375 decubitus ulcer patients. The most age group at age > 70 with female sex. The education level of most patients is Elementary School while the most occupations are housewives. The majority of patients were treated in the regular ward rather than in the intensive care ward. The main comorbid disease was malignancy, while the length of treatment was generally 0-10 days (Table 1). The most common level of ulcer severity is stage 2 decubitus ulcers with a predisposition to the location in the sacrum area. The most widely used decubitus ulcer wound treatment technique is hydrogel dressing. The most frequently used systemic antibiotic for decubitus ulcers is ceftriaxone (Table 2).

DISCUSSION

Decubitus ulcers are skin and soft tissue damage due to continuous pressure for a long time. Predilection of ulcers in protruding areas of the body, such as the sacrum, gluteus, trochanter, shoulder, malleolus and occipital. The causes of decubitus ulcers are multifactorial, generally due to ischemia and tissue necrosis. Decubitus ulcers can be both male and female, the prevalence of decubitus ulcers shows no difference based on gender. Decubitus ulcers occur at all ages with the highest incidence in the elderly >60 years old whom experience chronic disease and prolonged bed rest. The distribution of the number of decubitus ulcer patients was more in women than men (56%), these results are in accordance with the study in Germany which stated that the incidence of decubitus ulcers was highest in women compared to men (71%: 29%).⁷ Aini and Purwaningsih (2013) in Indonesia stated the life expectancy of women is higher than that of men, thus the higher the age, the greater the inability to mobilize due to the disease.⁸ The distribution of the age group with the most cases of decubitus ulcers in this study was over 70 years old (29.1%), study in Brazil reported the highest incidence of decubitus study in Brazil reported the highest incidence of decubitus ulcers at the age of >70 years old (12.7%), research states in the elderly there is a decrease in skin tissue elasticity and vascularization, thereby increasing the risk of developing decubitus ulcer.⁹ Chronic disease can cause decreased mobility and prolonged bed rest will increase the incidence of decubitus ulcers. Efforts to prevent the occurrence of decubitus ulcers are very necessary, research by Sulidah and Susilowati (2017) in Indonesia reported the highest incidence of decubitus ulcers occurred in patients with elementary school education level (44.4%). The results of this study were most decubitus ulcer patients with elementary education level (38.1%). Sulidah and Susilowati also stated the level of knowledge about a healthy lifestyle is directly proportional to the level of education.¹⁰ Decubitus ulcer patients require optimal care in the hospital thus optimal treatment is needed in the form of topical and systemic therapy. Research in the UK stated the average hospital stay for decubitus ulcer patients was 50 days. Akbari-Sari et al (2014) in Iran reported decubitus ulcers were more common in patients treated in the intensive care unit compared to the regular treatment room.¹¹ In this study, the average hospital stay of patients with decubitus ulcers for 10 days was 186 patients (49.6%). Research in the Netherlands stated the average length of stay of patients with decubitus ulcers in the hospital was more than 13 days.

Table 1. Characteristics of subjects

Variable	Number of Cases (n=375)	Percentage (%)
Gender		
Male	165	44
Female	210	56
Age (Years Old)		
0-10	4	1.1
11-20	19	5.1
21-30	20	5.3
31-40	24	6.4
41-50	35	9.3
51-60	67	17.8
61-70	97	25.9
>70	109	29.1
Education		38.1
Primary School	143	21.6
Junior High School	81	31.2
Senior High School	117	2.7
Diploma	10	5.6
Bachelor Degree	21	0.5
Master Degree	2	0.3
Doctoral Degree	1	
Occupation		24.0
Housewife	90	23.4
Entrepreneur	88	16.8
Farmer	63	7.5
Laborer	28	7.2
Retired	27	5.6
Employee	21	5.6
Student	21	5.6
Unemployment	21	3.7
Civil Servant	14	0.3
Soldier	1	0.3
Lecturer	1	
Ward		24.8
Intensive Care Unit	93	75.2
Regular Ward	282	
Duration of Treatment (Days)		49.6
0-10	186	35.7
11-20	134	10.2
21-30	38	1.3
31-40	5	3.2
>40	12	
Comorbid		20.5
Malignancy	77	19.7
Cardiovascular disease	74	9.1
Pneumonia	34	8.3
Diabetes melitus	31	7.2
Sepsis	27	5.6
Kidney failure	21	4.5
Fracture	17	3.7
Urinary tract infection	14	3.5
Spinal deformity	13	3.2
Spinal cord injury	12	3.2
Other neurological disease	12	2.2
Systematic lupus erythematosus	8	1.9
Human immunodeficiency virus	7	1.9
Congenital abnormalities	7	1.6
Hematemesis melena	6	1.3
Tuberculosis	5	1.1
Liver cirrhosis	4	0.8
Chronic obstructive pulmonary disease	3	0.8
Erythroderma	3	0.5
Lucio Phenomenon	2	

Table 2. Clinical features and management of patients with decubitus ulcers

Variable	Number of Cases (n=375)	Percentage (%)
Diagnosis		
Stage 1 decubitus ulcer	62	16.6
Stage 2 decubitus ulcer	201	53.6
Stage 3 decubitus ulcer	58	15.4
Stage 4 decubitus ulcer	54	14.4
Region		
Sacrum	124	33.0
Some body parts	90	24.0
Gluteus	55	14.6
Posterior Trunk	51	13.6
Pedis	24	6.5
Cruris	17	4.6
Femur	6	1.7
Antebrachii	4	1.0
Occipital	4	1.0
Wound care technique		
Hydrogel dressing	127	33.9
Surgical & mechanical debridement	102	27.2
Hydrocolloid dressing	64	17.1
Topical antibiotic	52	13.9
Foam dressing	17	4.5
Surgical Intervention	13	3.4
Systemic Antibiotics		
Ceftriaxone	81	21.6
Levofloxacin	57	15.2
Ciprofloxacin	36	9.6
Metronidazole	35	9.3
Not getting antibiotic	24	6.4
Cefixime	22	5.9
Meropenem	19	5.1
Cefoperazon	15	4.0
Ceftazidime	14	3.7
Ampicillin	14	3.7
Cefazolin	13	3.5
Clindamycin	13	3.5
Azithromycin	9	2.4
Antituberculosis drug	6	1.6
Cefotaxime	5	1.3
Gentamicin	4	1.1
Amoxicillin	2	0.5
Amikacin	2	0.5
Cefepim	2	0.5
Streptomycin	2	0.5

The difference in the results of these studies may be due to local hospital regulations, insurance used, comorbid diseases which cause death and differences in the type of treatment carried out (75.2%). Another study stated patients with decubitus ulcers were more often found in the intensive care unit (ICU) as much as 14-44%. This difference in results may be caused by differences in the number of intensive care rooms and medical record reporting systems, methods of collecting research data, differences in the number of sample populations, differences in inclusion and exclusion criteria and unreported preventive measures.^{12,13}

Research reports, the majority of patients with decubitus ulcers have comorbid disease. Study in Brazil stated the main comorbidities were malignancy and

neurological disorders. The results of the study by Jaul et al (2018) in Israel also reported malignancy as the most generalized comorbidity in decubitus ulcer patients (61.5%). Jaul et al also mentioned malignancy is a chronic progressive disease that requires bed rest and long-term treatment thus it can increase the risk of decubitus ulcer in malignancy as many as 77 patients (20.5%).¹⁴ Systemic antibiotic therapy in decubitus ulcer patients is required to treat secondary infections that occur. A comprehensive study and systematic review conducted by Norman et al (2016) in Manchester stated that the effectiveness of administering several types of systemic and topical antibiotics in decubitus sores is still unclear.¹⁵ Study in the United States stated systemic antibiotics in decubitus ulcer conditions with clean wound bed yet

accompanied by cellulitis. Decubitus ulcers which do not improve after wound care and the use of topical antibiotics for 6 weeks with signs of cellulitis can also be given systemic antibiotics. Decubitus ulcers with symptoms of osteomyelitis can be given antibiotics and it is recommended based on the results of culture examinations and antibiotic sensitivity tests, given at the Inpatient Installation of RSUD dr. Moewardi Surakarta, among others, ceftriaxone, levofloxacin, ciprofloxacin, metronidazole, cefixime and meropenem.¹⁶

Severity of decubitus ulcers are divided into 4 stages. Stage 1 decubitus ulcers are if the depth of the ulcer reaches the epidermal layer only, stage 2 decubitus ulcers are if the depth of the ulcer reaches the dermis layer, stage 3 decubitus ulcers are if the ulcer depth reaches the dermis of subcutis layer and stage 4 decubitus ulcers if the depth of the ulcer reaches a deeper layer, namely to muscle, fascia or bone.¹ In this study, the most common decubitus ulcer was stage 2 decubitus ulcer in 201 patients (53.6%). A systematic review study conducted by Ferris et al (2019) in England reported the highest incidence of decubitus ulcers was stage 1 and 2 by 82% of all decubitus ulcer cases.¹⁷ Clark et al (2017) in England also stated the highest incidence of decubitus ulcers was decubitus ulcer stage 2.¹⁸ Decubitus ulcers often occur in areas of bony prominences such as the sacrum, gluteus, trochanter, shoulder, malleolus and occipital. In this study, the incidence of decubitus ulcers based on location often occurred in the sacrum area as many as 124 patients (33.0%). The results of a study conducted in the United States showed the location of the most decubitus ulcers was in the sacrum region as many as two-thirds cases of all decubitus ulcer patients.¹⁹ Decubitus ulcers in the sacrum region are associated with incontinence, paralysis or weakness in patient's limbs. Patients with normal sensory status are less likely to develop ulcers in the sacrum region because they are physiologically able to perform postural shifts or mobilization. The main management of decubitus ulcers is preventing the emergence of new ulcers, reducing pressure on the ulcer area with mobilization, using a decubitus mattress, wound management, surgical intervention and nutritional therapy. The most widely used decubitus ulcer therapy in this study was hydrogel dressing therapy for 127 patients (33.9%).

Wound management in decubitus ulcers depends on the severity of the disease. Wound management can be used in the form of dressings or debridement, a combination of both and reconstructive surgical management. Complications of decubitus ulcers such as periostitis, osteomyelitis, sinus formation, sepsis and even death can occur if the ulcer is not handled properly.^{16,20}

Debridement is removal of necrotic tissue or dead tissue in the wound which aims to accelerate the wound healing process and the formation of granulation tissue and prevent sepsis. Several types of debridement include enzymatic (an agent which is directly applied to decubitus ulcers), mechanical debridement (removing necrotic tissue using irrigation, hydrotherapy, wet to

dry dressing and abrasion techniques) and surgical debridement, which is removing all necrotic tissue using a scalpel or scissors.¹⁵ Wound dressings aim to minimize skin irritation, prevent and treat infection and balance wound moisture. Dressing should also be changed periodically to avoid contamination of the wound. Several types of dressings are often used, such as passive dressings such as gauze and active dressings in bioactive form. Several types of dressings made from active ingredients are adapted to the needs of the wound, including foam, transparent films, hydrogels and hydrocolloid. Foam dressing is a foam made from polyurethane, which is a semipermeable material that can be used for wounds with excess exudate and deep wounds. Hydrogel dressing is a dressing made of gel and water, where the dressing is suitable for dry wounds because it can bind water to moisturize. Hydrocolloid dressings are made of foam (polyurethane film) containing gelatin or gel based on sodium carboxymethylcellulose. Dressing is suitable for wounds with little to moderate exudate. Transparent films function to retain fluids and retain moisture, so it is recommended for dry wounds.^{20,21} Stage 3 and 4 decubitus ulcers with large defects may require surgical intervention. Defect closure can use several techniques such as direct closure or primary cap, skin graft, regional flap, pedicle flap and free flap.²² Surgical intervention aims to reduce exposed tissue and reduce dead space and reduce the incidence of secondary infection. Indications for surgical procedures in decubitus ulcers are ulcers without purulent discharge, good granulation tissue and free from contamination. Factors which can inhibit the wound healing process such as age, infection, malnutrition, diabetes mellitus, malignancy, edema, alcohol or cigarette consumption, use of immunosuppressant drugs.²³

Reconstruction techniques which can be done are simple to pedicle flap and microvascular flap. Reconstructive surgery is indicated for large ulcers, involvement of internal organs and blood vessels, osteomyelitis or chronic wounds that do not heal with other treatment modalities.²³ The main treatment for decubitus ulcers includes debridement of necrotic tissue, controlling infection with antibiotics, optimizing nutrition, selection of appropriate dressings and regular monitoring.²⁴ A limitation of this study is the absence of evaluation data for decubitus ulcer healing because it is not listed in the electronic medical record, so it is hoped that the use of electronic medical records in further studies on decubitus ulcers can be more complete and comprehensive for evaluate patient outcomes. Decubitus ulcers are the most often complication of hospitalized patients due to prolonged bed rest. The presence of comorbidities is a complication of ulcer treatment, so care and preventive measures are needed to improve the patient's prognosis.

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