

Prevalence of Pressure Ulcers in Orthopaedic Patients

Ali M. Al-Shadedi

ABSTRACT:

BACKGROUND:

Pressure sore in orthopedic patients is a common problem with high expectation of occurrence on the ward, it should be watched for in any admitted patient having high liability for its development like, old age particularly those patients with dementia, patient with malnutrition or anemia and long stay in bed or complicated multiple surgeries.

Orthopedic staff should be familiar with measures required to prevent and reduce its occurrence.

OBJECTIVE:

To highlight the prevalence, onset, types and number and the most common sites of pressure sores, length of stay in hospital with various types of treatment delivered to these patients in orthopedic wards.

PATIENT AND METHODS:

215 patients were admitted with orthopedic problem for treatment and observed for the possibility of occurrence of pressure ulcer in orthopedic ward. The data collection period was over five years; these patients were treated for trauma to proximal femur, hip joint, pelvis and elective surgery at Al-Sader teaching Hospital of Kufa College of Medicine in Najaf City and Al-Yarmouk teaching Hospitals of Al-Mustanseria College of medicine in Baghdad city. Braden scale was used for predicting pressure ulcer and for assessing these patients.

RESULTS:

215 patients were assessed for being at risk of developing pressure sores by using Braden scale for predicting pressure ulcer. 60 patients with various levels of risk factors with prevalence of 27.90% developed the pressure sores. The age range of patients with pressure ulcer was 42-77 years, with mean age of 63.2 years. Female patients were 40 and male patients were Pressure sores developed in 42 [70%] patient with trauma out of 60 patient under study, 10 patient 16.6% with elective surgery patients, two patients 3.32% conservatively treated patients, and 6 patients 9.96% treated for removal of old implants. 13 patients developed ulcer at the first week and 10 patients developed pressure ulcer at the second week of their stay in orthopaedic ward and the rest 37 patients developed it after the second week of their stay in the ward. .

CONCLUSION:

Prevention of pressure ulcer requires the collaboration of all the nursing and surgical staff from different specialty like orthopaedic surgery. Development of pressure sore is the cause behind delay of patient discharge after successful surgery. Expectation of the development of bed sore is significantly high in elderly or bed ridden and hemiplegic patients.

KEY WORDS: pressure ulcer, bed sore .

INTRODUCTION:

Pressure ulcer are defined as skin breakdown and continuum of tissue damage of ischemic etiology secondary to high external pressure which usually occurs over prominences⁽¹⁾

Pressure ulcers are caused by intrinsic and extrinsic factors. The intrinsic factor includes immobilization, cognitive deficit, chronic illnesses, poor nutrition, use of steroids and aging^(2,3)

Pressure is a crucial factor in bed ulcer development, pressure of 70 mm Hg. Over bony prominences for 2 hours or more is enough to cause an ischemic wound⁽¹⁾

Individual who cannot independently reposition tend to be at the greatest risk for ulcer development.⁽⁴⁾

Skin assessment includes comprehensive assessment that addresses areas at a minimum risk factors, pressure points, nutrition, hydration, and moisture as well as minimal skin assessment

Kufa University Medical College.
Consultant Orthopedic Surgeon.

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of the following factors: skin temperature, color, turgor, moisture status, and integrity⁽⁶⁾

Pressure ulcers are associated with poorer quality of life, loss of function, greater risk of death, and higher health care costs.⁽⁷⁾

Pressure ulcer prevalence rates in America reported by national pressure ulcer advisory panel 2001, ranges from 2.3%-28% and incidence of 2.2-23%.⁽⁸⁾ The international health care publications report of prevalence of 3-22% with incidence rate of 1-11% in hospitalized non intensive care patients.⁽⁹⁾ The rates are surprisingly not varying much in critical care patients in the intensive care units where the prevalence rates 14.4%, and the incidence is 5.2-20%.⁽¹⁰⁾

The need for research into bed sores in orthopaedic patients is evident from the increased number of beds they occupy and the considerable morbidity from pressure sores in orthopaedic wards.

Increased orthopaedic surgery is performed on the elderly, and correlation between advanced years and high rates of bed sores is established internationally.⁽⁷⁾

Orthopaedic wards already contain a higher proportion of beds with pressure sores than those of any other specialty. Reports showed 11.9% - 19.2 incidences in orthopaedic wards against 8.8% - 9.2% in all inpatients.⁽¹¹⁾ Orthopaedic patients with pressure ulcers experience greater morbidity and mortality than patients without pressure ulcers.^(11,12) The risk of infection is increased; surgical procedures may need to be postponed.

Hip fractures and hip replacements are two of the most common reasons of orthopaedic ward admission and are particularly associated with secondary development of pressure sores.⁽¹³⁾

PATIENTS AND METHODS:

215 patients were admitted and observed for the potentiality of development of pressure ulcers in patients in orthopaedic ward over the period of five years. The sample was collected conveniently. Data collection was done through supervising patient in the ward during the period of stay and all the data collected on the daily round bases were put in the data collection paper. The collection paper was prepared in advance and used accordingly. All findings concerning the patient and ulcer development were documented like name, age, sex, onset of ulcer, site, size, types and number of sores and length of stay. These patients were admitted and treated for

trauma to proximal and shaft of femur, hip joint, elective surgery and surgery for removal of old implants.

Inclusion was done on the basis of Braden scale 1987,^(14,15,16,18) risk criteria which was used to evaluate 215 patients admitted during data collection period for possibility of being at risk for developing pressure sores.

All patients showing the potentiality of developing clinical signs of bed sores were selected and put on the study list. The lowest risk scoring is 6 points and the highest is 20 points, the low risk patient should have 15-16 points on Braden Scale, the moderate risk patient should get 13-14 points while the high risk patient score 12 points and less.

Patients excluded from the study were:

- The oldest patients. With age more than 80 years.
- Most sick patients due to terminal illnesses.
- The worst pressure sores.

These patients were primarily excluded from the study on the basis of the greater risk of death during study period resulting from surgery, anesthesia and longer stay in the ward which ultimately leads to higher probability of later exclusion.

Statistical Analysis: Statistical analysis was done by using SPSS version 11. Numbers, percentage were calculated in addition to Chi-square test for categorical data. P-value <0.05 was regarded as significant.

RESULTS:

215 patients admitted during data collection period were put on Braden Scale for assessing risk of development of pressure sore, 60 patients with prevalence of 27.90% showed different level of risk. 33 of our patients 55% were at low risk group, 19 patients 31.67% were located at moderate risk patients and the minority 8 patients 13.33% were segregated at high risk group.[Tab.1& Fig.1] Patients developed the ulcers mainly on the sacrum, buttocks and heel.

Types of treatment delivered to the patients:

Out of the 60 patient completed the study, 42 of ulcer patients 70% were treated for trauma mostly for fracture hips, pelvis or proximal femur or spine. 10 patients 16.6% were admitted for elective surgery and 6 patients 9.96% were treated for removal of old implants. 2 patients 3.32% were admitted for conservative treatment.

Out of these 42 patients treated for trauma, the most common trauma operations were internal fixation of the hip, femur and pelvis done for 24

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patients, 10 Females patients and 14 males. Hemi- and arthroplasty surgery were done for 12 patients, 8 females and 4 males. While spinal surgery were 6 patients, 2 females and 4 male patients, [Fig. 2].

Sex, age and prevalence rate:

The patient's age range was between 42-77 years with mean age of 63.2 year. Bed sore suffering Female patient was forty patients [40%] out of total of 100 female patients and male patients were twenty patients [17.4%] with bed sore out of total of 115 male patients under study with overall prevalence of 27.90%. Two patients with prevalence 4.4% were less than 50 years, 8 patients [10%] were between 51-60 years, 32 patients [45%] were between 61-70 years, and 18 patients with prevalence of 90% were between 71-80 years of age.

Onset

13 patient [21.60%] developed ulcers at day of operation and the first week after admission due to improper operative and post-operative

circumstances, further development takes place in 10 patients [16.66%] during the second week and around 37 patient [61.42%] after the second week of admission.

Types, numbers and body distribution of ulcers:

All patients studied had total of 92 separate ulcers in ratio of more than 3 times to women as for men [Fig. 3]. About 61% of patients had one ulcer, 16% men to 45% women. While 39% had multiple ulcers, 9% of men and 30% of women. [Fig. 5]

The sores are distributed over the sacrum's in 52%, over the heels 26% and the remainder over the buttocks, and greater trochanters. [Fig. 6]

Length of stay

The lengths of stay of patients with bed sores exceed the stay of non sores patients on orthopaedic wards by several times. The non ulcer patient stays in hospital with mean of 6.7 days per patient, while ulcer patient mean stay exceeds 3.2 weeks per patient.

Tab.1 : Risk distribution of Pressure Sore Patients according to Braden Scale.

Risk Group	Low Risk	Moderate risk	High Risk
No. of Patients	33	19	8
%	55	31.67	13.33

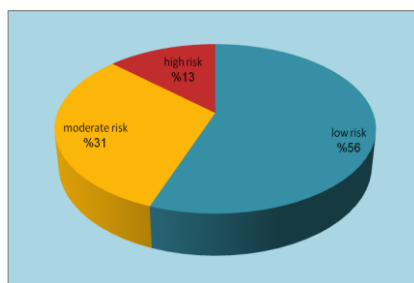


Fig.1: Risk Distribution of Pressure sores Patients according to Braden Scale

Tab. 2: Bed sore development according to age with prevalence

Age in Years	Sore patients	Nosore patients	Total group	Prevalence sore patients	Chi square	P value
< 50	2	43	45	4.4%	74.424	0.000
51-60	8	72	80	10%		
61-70	32	38	70	45%		
71-80	18	2	20	90%		
Total	60	155	215			

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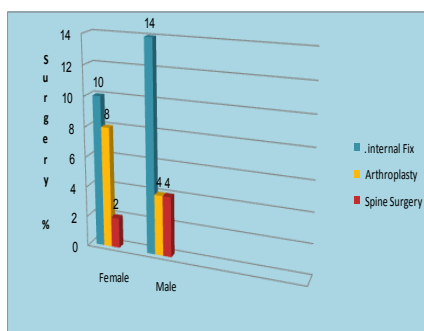


Fig 2: Distribution of Trauma Patient operation according to sex

Tab. 3: Sex Distribution of bed sores for the study group

	Bed Sore Patients		No Bed Sore Patients.		Total	Chi square	P Value
Male	20	17.4 %	95	82.6%	115	100%	13.590 0.006
Female	40	40 %	60	60%	100	100 %	
Total	60	27.9%	155	72.1%	215		

Tab. 4 : Post - admission onset of Sore .

Time of onset	No. patients	%
First Week	13	21.66
Second Week	10	16.66
After second week	37	61.42
Total	60	100

Tab. 5: Sex distribution and prevalence of pressure sores in various age groups.

Age in Years	Total No.	Male Patients	Female Patients	prevalence
< 50	45	1	1	4.4%
50-60	80	3	5	10%
61-70	70	10	22	45%
>70	20	6	12	90%
Total	215	20	40	

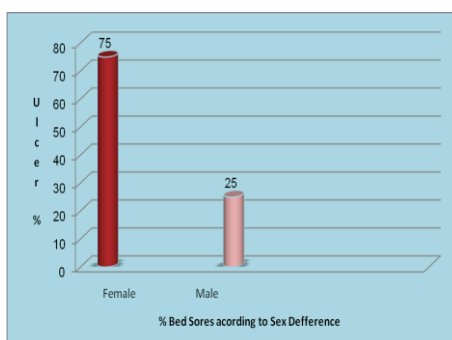


Fig. 3: % Bed Sore According to Sex.

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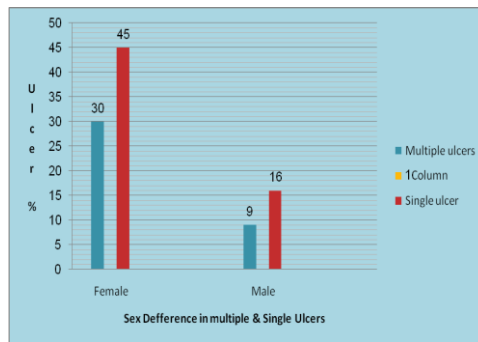


Fig. 4 : Sex Difference in multiple and single Ulcer development.

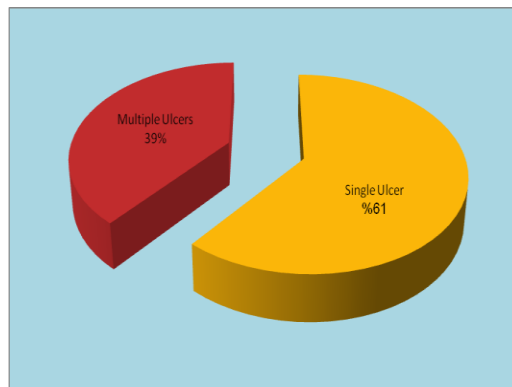


Fig 5: Percentage of single and multiple ulcers

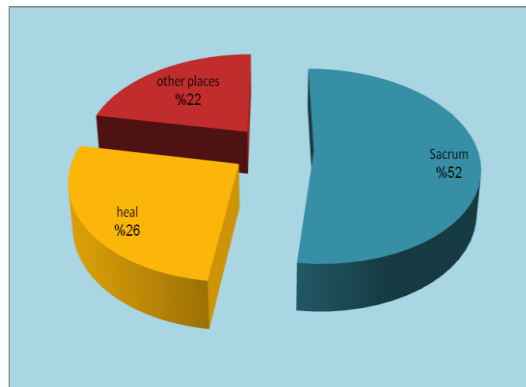


Fig 6: Percentage of Distribution of Ulcers in Various Parts of the Body

DISCUSSION:

The prevalence rate of pressure sores in this study is 27.90% which is higher than the prevalence rate reported by the international health care publication of 3% - 22% in hospitalized patients.⁽⁹⁾ Our reported onset of ulcer after admission was in 21.66% of involved patients by the end of the first week and 16.66% of cases by the end of the second week of admission and 61.42% later than second week [Tab 5]. These figures correlate well

to the quality of nursing care and ward facilities available to our patients. Patients undergoing orthopedic procedures are at risk of pressure ulcers formation during the phases of peri-operative period for variety of reasons, top in order is the low nursing care.

Pressure ulcers are often described as indicator of the quality of care.⁽¹⁸⁾

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Our paper has reported that the prevalence of ulcer rises steadily with age. [Tab.3] this is very well demonstrated in other studies.^(9,11) There is a highly significant difference in prevalence of various age groups especially those with 61-80 years of age. Women are double the men in having bed sores with significant increase of prevalence in older age group in our series. [Tab.6].

Approximately three times as many patients with fractures 70% as patients having elective surgery and patients admitted for removal of old implants 30% reflect difference in risk factors between the two groups of patients. This probably because the patients are selected carefully for elective surgery regarding the age and health than those cases treated for trauma.

During the period of patient selection we considered the most important risk factors:

1-The age.

Patient age is important element to dictate close observation and frequent check especially of the old patient susceptibility for bed ulcers. Elderly patients who had falls and develop fractures are frequently associated with underlying chronic illnesses and trauma⁽²⁰⁾ Which ultimately lead to reduce activity?

2-The mental health.

It is a significant determinative factor for the increased risk of occurrence of bed sore. Various degree of unresponsiveness for sensory perception is important in risk factors evaluation.

3-Type and site of trauma.

The expected site and size of sore has strong relation to the site and type of the injury especially in bed ridden patient with reduced mobility.

4-Site and size of surgery

Major surgery and sites especially at the back and hips or pelvis has strong influence on the severity and rapidity of onset of pressure sores appearing on the sacrum and bony prominences.

5-The nutritional status.

It is well known fact that patients with inadequate nutrition particularly with dehydration are more prone for the pressure ulcers.

6-General health and chronic diseases.

Bad general health and chronic illnesses are well known factors for the liability of high incidence of bed sores due to increased risk of friction and shear.

Sacrum was that part of the body with highest ulcer development rate which was explained by the nearby sites of surgery on hip, pelvis and spine in addition to neglect ion of frequent turning over by nursing staff during the period of hospitalization. The period of stay in orthopedic ward has increased in ulcer patient [3.2 weeks] by about three folds over the non ulcer patient [6.7 days] due to increased risk of infection. Post operative rehabilitation may be delayed because of limited mobility and weight bearing. More over surgical procedures may need to be postponed.⁽²¹⁾ All these are well known contributing factors to the delay in patient discharge.

Categorization of patient according to Braden scale [Fig.1] revealed that most of our patients were falling in the low risk and moderate risk groups and the least were in high risk, we believe that this is so because most of them tend to be younger and healthier if compared with the high risk group.

No clear connection for the cause between the operation and the onset of pressure ulcer, this reflects the possibility of multifactorial causes. A relationship could be established in this study between the time spent in hospital and the rate of development of a sore where the rate was 21.66% during the first post-admission week rising to 61.42% in the weeks following the second one, this is because in addition to the delay of the patient in bed there are other contributing factors like age, type and degree of morbidity, mentality state, and mobility apart from the type of nursing care presented to them in the ward. Some patients develop ulcer early after admission while other develop it very late [Tab 4]. The period of immobilization in recumbent position is a decisive factor in producing the sore and deciding their site. Pressure ulcers have been shown to develop within 2 to 6 hours.⁽²²⁾

MRI studies in animal models have shown that 2 hours of in vivo muscle compression causes local damage; contrast-enhanced MRI showed level of hypo perfusion throughout the muscle.⁽²³⁾

Frequent patient turning, close monitoring and frequent skin checks are important factors in the prevention of pressure ulcer.⁽²¹⁾

Pressure ulcer can be devastating complication in the care of orthopaedic patients. Open sores obviously delay discharge to home.

CONCLUSION:

- Prevention of the pressure ulcers in elderly require more expertise than the nursing staff can offer, obviously the disease is multifactorial in origin and reduction of incidence requires the skill of all the orthopaedic team and the facilities available to them.
- Age was an influencing factor in the increase of the number of patient with pressure sores on the orthopaedic wards.
- Successful operation would surely result in reduction of the incidence of pressure sores in old patients.
- The development of pressure sores was surely the reason behind delay of the discharge of patients and increasing the length of stay in hospital.

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