

The Development of Pressure Injuries in Patients Referred to Mater Dei Hospital from St Vincent de Paul Long Term Care Residence

A retrospective observational study

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Background

Pressure injuries are potentially preventable. They are caused by unrelieved pressure causing damage to underlying tissue via pressure, friction or shearing movements. Pressure injuries are a cause of morbidity and mortality in the elderly population. Elderly patients transferred to acute hospitals are at an increased risk for pressure injury development.

Methods

A retrospective observational study design was adopted. Data was collected from iSOFT and the patients' medical file. The population studied were patients who returned to SVP from MDH between the 1st November 2022 and the 14th February 2023. Data was analysed using SPSS 27.0.

Results

Over 106 days of the study period, 56 patients were referred for acute care. Of these, 19.64% (n=11) developed new pressure injuries. The mean length of stay was 9.892 days. The incidence of pressure injuries varied between different departments (Medicine – 18.5%, Surgery – 8.3%, Orthopaedics – 66.7%, Urology 25%, Vascular, Neurology, Ophthalmology and Gynae - 0%). Patients admitted under Orthogeriatrics for a fracture femur had an 80.0% incidence of developing new pressure injuries. The sacral area was the most common site. Most pressure injuries were of Grade 1 (n=7). There was a weak but statistically significant correlation between duration of stay and the development of ulcers ($r_s = .36$, $n = 56$, $p = .006$). Documentation of pressure injuries was absent from the medical notes and inconsistent in the nursing notes.

Conclusion

Prevention is cost effective, results in shorter hospital stays and improves the patients' morbidity, mortality and quality of life. Greater efforts at preventing pressure injuries in this specific population are warranted.

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Pressure injuries are caused by pressure that goes on unrelieved for long enough to cause damage to any underlying tissues. Most of the time this happens in areas of bony prominences. There are also episodes in which the pressure is caused by a medical device-related pressure. Their degree will range from non-blanchable erythema to deep ulcers with extension into a bone. Three mechanisms of injury have been described: pressure, friction and shearing movements.

Pressure injuries are a leading cause of morbidity and mortality in the elderly.¹ Preventing pressure injuries from developing has been shown to be both cost effective and to improve the patients' quality of life.²⁻⁴ Patients who are transferred to an acute general hospital carry an increased risk of developing pressure injuries unless preventive measures are implemented early on during their admission.⁵ It has been anecdotally noted that a number of patients residing at St Vincent de Paul Long Term Care Facility (SVP) who were referred to Mater Dei Hospital (MDH) for acute care, returned to SVP with a number of sores. Patients referred from SVP to MDH are generally frail and may have a number of predisposing factors that facilitate the development of pressure injuries.

This study aims at quantitatively analyse the development of pressure injuries in SVP residents who are transferred to MDH for acute care.

METHODOLOGY

Data was collected retrospectively using iSoft and the patients' medical records. All patients re-admitted to SVP from MDH during the period 1st November 2022 to 14th February 2023 had their file analysed by the researchers for the development of new pressure injuries during their admission at MDH.

The data collected included the patient's age, gender, reason for referral, MDH department, duration of stay, development of pressure injuries, degree and sites. We also looked at the medical and nursing notes to identify any documentation available.

The data was then analysed using Microsoft Excel for descriptive statistics and SPSS24.0 for analytical statistics. Significance was achieved when $p=0.05$ with a confidence interval of 95%

Ethical clearance for this study was obtained from the SVP Medical Director. All data was stored in a password protected online Excel sheet. Password

was available only to the researchers. No patient identifying data was collected.

RESULTS

Over the study period (106 days) a total of 56 patients returned to SVP from MDH. Two of these patients were referred twice and one patient was referred three times. This results in a total number of 52 individual patients who were referred to MDH for acute care.

The age of the patients ranged between 57 years and 93 years with a mean of 79.29 years, median of 82 years and a mode of 80 years.

Table 1 shows the total number of days in MDH and the average stay for the whole population of our study and for male and female patients respectively. The range of stay was between 1 and 51 days with a mean of 7.89 days and a mode of 2.0 days.

Our study showed an overall incidence of 19.64% for the new development of pressure injuries in patients admitted for a period of acute care from long term care. Systematic reviews have shown a prevalence of 0.3%-46% for pressure injuries in the aged with an incidence of 0.8-43%.⁸ These wide-ranging values are the result of the heterogeneity of the studies included in the systematic review.⁹

48.2% (n=27) of the patients were admitted under Medicine. The reasons for referral varied and included status epilepticus, acute severe asthma, profound hyponatremia, hypomagnesaemia, confusion, bilateral pulmonary embolism, stroke, renal biopsy, pneumonia and chest pain. Five of these patients (18.5%) developed pressure injuries.

Surgical admissions (21.4%)(n=12) consisted of a mix of emergencies and elective surgeries. Cases included lower GI bleeds, RIH repair, descending colon perforation, cholecystolithiasis, nephrectomy, transurethral resection of a bladder tumour and elective colonoscopy. Only one (8.3%) of these patients developed a pressure injury.

Table 1 Days spent in MDH

	Total population	Males	Females
Number of patients	56	28	28
Total number of days	442	274	168
Average number of days	9.892	9.785	6.0

Vascular admissions (7.1%) (n=4) were all for elective procedures – trans-positioning of a brachio-cephalic fistula, angioplasty of the right AV fistula, fem-pop graft and a left hallux amputation. None of these patients developed a pressure injury despite their already compromised vascular status.

Six patients (10.7%) were admitted for orthopaedic procedures – 5 with hip fractures and 1 for a total knee replacement. 4 (80%) of the 5 patients admitted following a hip fracture developed pressure injuries during their acute stay. 3 out of these four developed multiple pressure injuries (sacrum and heel). The patient admitted for a total knee replacement developed no sores. All 5 patients with a hip fracture were also under the care of orthogeriatricians.

One of the four (25.0%) of the patients admitted under Urology developed a sacral pressure injury.

None of the patients under Ophthalmology (n=1), Gynae (n=1) or Neuro (n=1) developed any pressure injuries during their stay at MDH.

The above findings are summarised in [Table 2](#), whereas [Table 3](#) shows the average length of stay per department.

In all of the cases, no notes relating to pressure injuries could be identified in the medical notes. Nursing notes, on the other hand, were not consistent. For example, a patient may be documented to be suffering from a sacral sore on one day, only for the sore not to be documented on the following day and then be again documented after another day. In some cases, the sore was not documented in the nursing notes but note was made of the type of dressing being used.

Analytical statistics showed a significant correlation between duration of stay and the development of

sores. Nonparametric correlation analysis using Spearman's rho was weak ($r_s = 0.36$, $n = 56$, $p = 0.006$).

DISCUSSION

pressure injuries in the elderly are common but potentially preventable. Preventing pressure injuries from developing is cost effective and will have a positive impact on the patient's morbidity, mortality and quality of life.

The deleterious effects of pressure injuries have been well documented in the literature. They are known to cause pain and interfere with the patient's mobility and social activities.⁶ pressure injuries have also been associated with negative emotional and social impacts.⁷

Our study showed an incidence of 19.64% for the new development of pressure injuries in patients admitted for a period of acute care from long term care. None of these patients had pressure injuries prior to their admission for acute care. Systematic reviews have shown a prevalence of 0.3%-46% for pressure injuries in the aged with an incidence of 0.8-43%.⁸ These wide-ranging values are the result of the heterogeneity of the studies.⁹

The population of this study is at a much higher risk of developing pressure injuries than the average older person. Most will be extremely frail, have limited mobility (which may become worse after they sustain a fracture), may have significant loss in their sensory abilities and may be unable to reposition themselves with ease. A number will also suffer from cognitive impairment and may be unable to communicate discomfort or pain in a verbal way. All these factors increase the risk for these patients

Table 2 Development of pressure injuries per department

	Patients admitted	Patients developing pressure injuries
Medical	27	5 (18.5)
Surgical	12	1 (8.3)
Ortho	6	4 (66.7)
Vascular	4	0
Urology	4	1 (25)
Ophth	1	0
Gynae	1	0
Neuro	1	0

Table 2 Average length of stay per department

	Average length of stay in days
Medical	5.24
Surgical	11.67
Ortho	10.17
Vascular	11.0
Urology	5.0
Ophth	1.0
Gynae	10.0
Neuro	4.0

to develop a pressure injury unless preventive measures are in place from the very start of their acute hospital stay.¹⁰

Our study demonstrates an extraordinarily high incidence of pressure injuries in patients referred after suffering a hip fracture. These patients are the ones who will have become immobilised because of their injury. Moreover, many times their operation is repeatedly postponed for one reason or another. This results in prolonged fasting periods which will have a negative impact on the patient's nutritional status. Frequently turning these patients may be difficult because of the pain they experience with each movement. Appropriate mattress provision may not always be timely. Patients referred from SVP to MDH following a hip fracture are automatically seen by Orthogeriatricians from the medical point of view.

On the other hand, it is remarkable that none of the Vascular patients, despite their inherently compromised peripheral circulation, have developed any pressure injuries. Studies may need to be conducted to identify differing practices between the Vascular and Orthopaedic departments.

The lack of notes in all the medical notes is of concern as is the inconsistent documentation in the nursing notes. This could result in pressure injuries being overlooked. It could also be that the acute setting is not geared towards the prevention of pressure injuries and, therefore, their importance may not be

acknowledged serious enough to merit a review and a note in the medical file.

A risk assessment that aims to identify at risk patients at A&E level is important. This should include a thorough history and examination and should identify potentially correctable factors.¹¹ This risk assessment needs to be followed by regular follow-up to monitor the patient's clinical condition with particular attention to factors that may increase the risk of developing pressure injuries. The skin needs to be inspected daily so that any pressure-induced changes are identified as early as possible. Validated risk prediction scales such as the Waterlow scale or the Norton and Braden Scale may also be used to help identify those at risk.¹² It is essential that such a risk assessment is performed as early as possible during the patient's trajectory in acute care. This is because pressure injuries are known to develop within hours and, therefore, waiting for the patient to be admitted to the ward to perform the risk assessment might be already too late for some of these frail patients.¹³

Attention needs to be given to areas of skin that more likely to be the site of development of pressure injuries. These are usually sites where thin skin overlies a bony prominence. **Figure 1**, taken from Best Practice Statement (Wounds UK, 2012) graphically described the areas that are common sites for pressure injuries.¹⁴

The three major mechanisms that contribute to the formation of pressure injuries are pressure, shearing

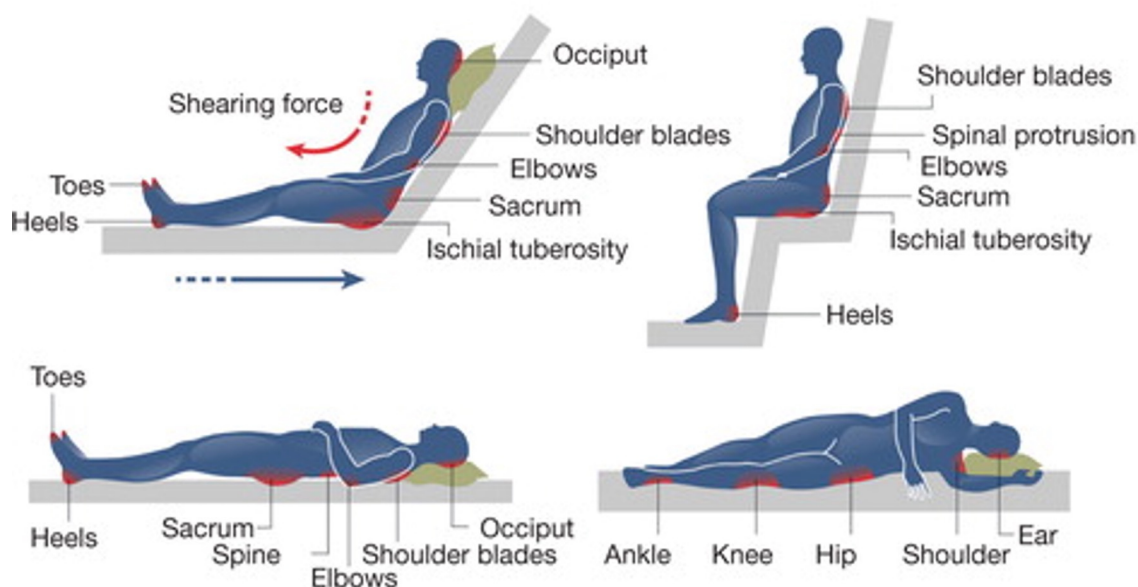


Figure 1 Common sites for pressure ulcers (taken from Best Practice Statement, 2012)

forces and friction. As shown in figure 1, the area most likely to develop a pressure injury will depend on the positioning of the patient. Continuous pressure will compromise the blood supply to the underlying tissue leading to hypoxia and possibly necrosis. This process will be much faster in those with an already impaired blood supply, for example, patients with peripheral vascular disease.¹⁵

Other mechanisms of skin injury include skin rubbing against clothing or bedding. Shearing forces also come into play such as when the end of the bed is elevated. A patient may because of this position, slide on a bed sheet with resultant shearing forces. This in turn causes rupture of blood vessels because of inter-tissue plane movements. This rupture may lead to impaired blood supply and possibly necrosis.¹³

It has been estimated that the treatment of pressure injuries costs the UK NHS 3.8million GBP per day.¹⁶ and may prolong a patient's hospital stay with about 10 days.¹⁷ Prevention of pressure injury is, therefore, cost effective and can result in shorter hospital stays.

LIMITATIONS

This study only investigated a period of 106 days. Larger studies may give a clearer picture of the situation. Only patients from one site (SVP) were included in the study. Further studies to analyse the development of pressure injuries in elderly people living in nursing homes or in the community and admitted to MDH would give a clearer picture. The patients included in our population are the frailest of patients. This may have had a strong bearing on the results. Our data collection did not include frailty levels.

RECOMMENDATIONS

- Setup of a working group between SVP and MDH to identify practices that can be improved to help reduce the number of pressure injuries in SVP patients referred to MDH for acute care
- Provision of more in-house services at SVP to decrease the number of patients needing transfer to MDH
- The introduction of risk stratification and preventive measures at A&E level.
- Avoidance of postponement of orthopedic operations.
- Review of the work practices in the Orthogeriatric department.
- Larger studies to decrease the bias introduced by small numbers.
- Regular reviews by nutritionists to ensure proper nutrition in at-risk individuals

CONCLUSION

Patients residing at SVP are among the frailest in the country. For a variety of reasons, their risk of developing pressure injuries is inherently higher than average. This is further compounded when they are referred to MDH for acute care. Pressure injury prevention has been shown to be possible with proper care. Prevention is cost effective, results in shorter hospital stays and improves the patients' morbidity, mortality and quality of life. Greater efforts at preventing pressure injuries in this specific population are warranted.

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