Pressure Ulcers: Victims Of Immobilization

N Kohali, H Nautiyal, S Dvivedi, P Khaneda, P Sachan, R Nautiyal

Citation

Abstract
Pressure sores are a common problem and have a major effect on patient morbidity, mortality, rehabilitation and health care expenditure, which are potentially preventable complications of immobilizing illness. A general lack of knowledge or interest in this problem has fostered inadequate preventive care and poor understanding of treatment. We conducted a prospective study in 70 admitted patients with 132 pressure sores. Patients were predominantly men (74.29%), considered young adults (21-30 years, 30%). The most common location of pressure sore was sacral (47.73%) followed by gluteal (21.21%), heel (7.58%) and occipital (6.06). The majority (82.86%) of patients who developed pressure sores used to change their posture less frequently. We found that mere frequent change in postures and arrangement of pressure alternating devices instead of simple mattresses can prevent pressure ulcers in a large number of the patients.

INTRODUCTION
Pressure sores are also known as bedsores, pressure ulcers and decubitus ulcers and can be defined as “a localized area of tissue necrosis that tends to develop when soft tissue is compressed between a bony prominence and a hard surface for a prolonged period of time” [1].

Pressure sores are staged from I to IV, according to the depth of observed tissue damage [2].

Pressure sores are a common problem and have a major effect on patient morbidity, mortality, rehabilitation and health care expenditure, which are potentially preventable complications of immobilizing illness. The pressure sores often require more efforts and manpower, longer hospital stay and greater expenses, as compared to the primary ailment causing these. A general lack of knowledge or interest in this problem has fostered inadequate preventive care and poor understanding of treatment.

MATERIAL AND METHODS
The present prospective study was undertaken at the Himalayan Institute of Medical Sciences, which is a tertiary medical care centre in the state of Uttarakhand. It is one of the first studies on pressure sores in the Garhwal region of Himalayas. In this prospective study, 132 pressure sores in 70 patients reporting to the various disciplines of the Himalayan Institute of Medical Sciences Dehradun over a period of eighteen months (October 2007 to March 2009) were evaluated.

INCLUSION CRITERIA
All the patients of pressure sores, admitted in various disciplines were included in this study.

EXCLUSION CRITERIA
All the patients who were not willing or lost in follow-up were excluded from the study.

The details of the subjects in terms of history, clinical features and investigations were recorded on an investigator-designed proforma after obtaining an informed consent from the patient. The “National Pressure Ulcer Advisory Panel (NPUAP)” classification (U.S.A 1989) of pressure sores was used for the description purposes.

Photographs of all these patients were taken at initial presentation and in subsequent follow-up.

Subjective assessment regarding patient’s awareness, frequency of change in posture, nursing care of back, professional physiotherapeutic care and mattresses that were used by pressure sore subjects were recorded.

OBSERVATION AND RESULTS
Patients were predominantly men (74.29%), considered young adults (21-30 years, 30%).
Figure 1

The most common location of pressure sores was sacral (47.73%) followed by gluteal (21.21%), heel (7.58%) and occipital (6.06).

Figure 2

The majority of pressure sores were of grade II (39.39%) followed by grade IV (20.45%), grade III (16.67%) and grade I (15.90%).

Figure 3

Table I: Location of pressure sores

<table>
<thead>
<tr>
<th>Types</th>
<th>No. of pressure sores</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Occipital</td>
<td>8</td>
<td>6.06</td>
</tr>
<tr>
<td>Back</td>
<td>5</td>
<td>3.79</td>
</tr>
<tr>
<td>Sacral</td>
<td>63</td>
<td>47.73</td>
</tr>
<tr>
<td>Gluteal</td>
<td>28</td>
<td>21.21</td>
</tr>
<tr>
<td>Ischial</td>
<td>4</td>
<td>3.03</td>
</tr>
<tr>
<td>Knee</td>
<td>2</td>
<td>1.52</td>
</tr>
<tr>
<td>Thigh</td>
<td>4</td>
<td>3.03</td>
</tr>
<tr>
<td>Ankle</td>
<td>5</td>
<td>3.79</td>
</tr>
<tr>
<td>Heel</td>
<td>10</td>
<td>7.58</td>
</tr>
<tr>
<td>Others</td>
<td>3</td>
<td>2.27</td>
</tr>
<tr>
<td>Total</td>
<td>132</td>
<td>100</td>
</tr>
</tbody>
</table>

Most of the patients (61.42%) developed pressure sores at the centre of study and the maximum number (58.57%) of pressure sores were first noticed by medical staff.
Table II: Where did the PS develop?

<table>
<thead>
<tr>
<th></th>
<th>No. of cases</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Centre of study</td>
<td>43</td>
<td>61.43</td>
</tr>
<tr>
<td>Elsewhere</td>
<td>27</td>
<td>38.57</td>
</tr>
<tr>
<td>Total</td>
<td>70</td>
<td>100</td>
</tr>
</tbody>
</table>

The maximum number of patients (55.71%) developed pressure sores within a month of their primary ailment.

Table III: Motor weakness associated with PS

<table>
<thead>
<tr>
<th>Weakness</th>
<th>No. of cases</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paraparesis</td>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td>Paraplegia</td>
<td>13</td>
<td>18.571</td>
</tr>
<tr>
<td>Hemiparesis</td>
<td>3</td>
<td>4.285</td>
</tr>
<tr>
<td>Hemiplegia</td>
<td>5</td>
<td>7.142</td>
</tr>
<tr>
<td>Quadriparesis</td>
<td>12</td>
<td>17.142</td>
</tr>
<tr>
<td>Quadriplegia</td>
<td>2</td>
<td>2.857</td>
</tr>
<tr>
<td>Total</td>
<td>42</td>
<td>60.00</td>
</tr>
</tbody>
</table>

Most (45.71%) of the patients who developed pressure sores were using simple mattresses.

Table V: Types of mattresses used in PS subjects

<table>
<thead>
<tr>
<th>Mattresses</th>
<th>No. of cases</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simple mattress</td>
<td>32</td>
<td>45.71</td>
</tr>
<tr>
<td>Air mattress</td>
<td>13</td>
<td>18.57</td>
</tr>
<tr>
<td>Water-filled air</td>
<td>11</td>
<td>15.71</td>
</tr>
<tr>
<td>Ripple mattress</td>
<td>13</td>
<td>18.57</td>
</tr>
<tr>
<td>Others (Fowler)</td>
<td>1</td>
<td>1.43</td>
</tr>
<tr>
<td>Total</td>
<td>70</td>
<td>100</td>
</tr>
</tbody>
</table>

Primary ailment was the chief concern of patient or his caretaker in the maximum (58.57%) number of cases rather than the pressure sore.
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DISCUSSION

In the present study, out of 70 patients, the incidence of pressure sores was noted to be highest (21 cases; 30%) in the age group of 21-30 years. This is in accordance with the studies of Noguera (2006) and Majumdar (2006) who, in their series, also observed that the highest incidence of pressure sores was in the age group of 21-30 years. They attributed the high incidence of pressure sores in this active decade of life to frequent travel, motor vehicle related accidents, firearms, industrial jobs and sports which could lead to spinal cord injury. The majority of the pressure sore patients presenting to various departments in the present series were males (52 cases; 74%) while 18 (26%) were females. This observation is in conformity with the observation of Noguera (2006), Thiyagarajan (2004), Mancussi Faro (2006) and Majumdar (2006) who studied cases of spinal cord injury and trauma and attributed the high incidence of spinal cord injury and pressure sores in males to the fact that it is the male population which is mostly involved in outdoor activities in relation to occupation as compared to females [3, 4, 5, 6].

Marks (1950) found that the most common location of pressure ulcers was sacral, followed by the gluteal region. Noguera (2006) and Keong (2004), in their series, observed that the most common location of pressure ulcer was sacral (37%), followed by heel (17%) and gluteal (11%). The sacrum is the area of the body that sustains the greatest amount of pressure in the lying-down position. Thus, it is the most common location of pressure ulcers in a bed-ridden patient. In the present series of 132 pressure sores, the majority were of grade II (52; 39%), followed by grade IV (27; 20%) and grade III (22; 16%), while grade I (21; 16%) accounted for the lowest number of pressure sores. This is in conformity with the observation of Noguera (2006) and Nixon (2006) who found that grade II were the most common types of pressure sores in their series [3, 9].

The reason of the higher frequency of grade II pressure sores is probably that it is often difficult to identify and diagnose the superficial varieties of pressure sores, hence the diagnosis is often delayed until a very evident grade II, III or IV pressure sore has developed.

In the present study, forty-three (61%) cases developed pressure sores while being treated at the centre of study, while twenty-seven (38%) developed pressure sores elsewhere, namely at home (16; 23%) and in other health centers (11; 16%) where the patient was being treated before coming to this centre. This was in accordance with the observation of Reddy (2006) who found that the incidence of pressure sores was highest in acute-care settings, followed by long-care and home-care settings [10].

Detection of initial pressure ulcer changes is difficult for patient, care-taker or even medical staff. If a proper and timely diagnosis is made, early preventive measures can be employed to prevent its progression. McDonagh (UK), in his article published in 2008, mentioned that distinguishing between pressure ulcers and moisture lesions can be challenging even for experienced practitioners [11].

The occurrence of pressure sores in the present series was first noticed by the medical staff in 41 (58%) cases. This is probably due to the fact that most pressure sores developed while the patient was being treated in the centre of study, rather than having a preexisting pressure sore.

Schoonhoven (2002) and Kvorning (1982), in studies on risk-assessment scales in pressure ulcers, observed that most pressure ulcers developed in the first four weeks. In the present study, the majority (39; 56%) of pressure sore patients developed pressure sores within 2-4 weeks of occurrence of the primary ailment. This can be attributed to inadequate application of risk assessment scales and preventive measures [12, 13].

Most (18; 25%) of the patients were either paraplegic or hemiplegic while 12 (17%) patients had quadriparesis and 7 (10%) patients had paraparesis [14].

In the present study, in 12 (17.14%) patients the position was being changed at a frequency of 2 hours, while 58 (82.86%) patients had a less frequent position change. In the
study of Leite (2006), 35% of patients had a frequent change of posture and pressure sores were present in 70% of the cases who were less mobile. He attributed this high incidence of pressure sores in less mobile cases to the prolonged ischemia due to continuous pressure. Similar results were observed by Cakmak (2009) in 32 immobilized patients with pressure sores, who found an inverse relationship between the grade of the ulcer and the frequency of change of position in bed [6, 15].

Park-Lee (2004), through a National Nursing Home survey in Nursing Homes of United States of America, found that only 35% patients with stage II or higher pressure ulcers received wound care by specially trained professionals or staff. In the present study, 36 (51%) patients got nursing care of back, while only 31 (44%) patients were provided physiotherapy care by a professional physiotherapist, and the rest of the patients were devoid of any nursing care of back [16].

This goes well with findings of Schoonhoven et al. (2002) who, in their prospective cohort study, analyzed that most patients at risk, according to the various risks assessment scales, did not receive preventive measures during their course of illness. This lack of back care could be due to inadequate use of risk assessment protocols, lack of awareness and lack of availability of enough trained personnel in the centre of this study [12].

The type of mattresses or beds used for nursing of patients at risk of pressure sores or those who suffer from pressure sores has also an implication on prevention, development, progression and healing of a pressure sore. In the present study, 38 (54%) patients were using pressure-relieving mattresses during having pressure sores. Simple mattresses that include home-made mattresses, cotton mattresses, rubber-foam mattresses and mattresses covered with synthetic leather foam were used by 32 (46%) patients. Air mattresses and ripple mattresses were used by 13 (18%) patients, while 11 (16%) patients were using water-filled air mattresses.

This is probably due to a lack of awareness, financial restraints and unavailability of enough pressure-relieving mattresses in most of the health care setups.

On subjective evaluation of 70 patients we found that in 24 (34%) cases, patients or care-takers were more concerned about pressure sores.

The worst varieties of single or multiple pressure sores complicating the original ailment are sometimes so grave that they can outrun the efforts and finances required in treating the primary ailment. The disease process and extended convalescence become exhausting not only for the ailing patient but also for his family and the health care provider.

CONCLUSION

Patients with chronic as well as acute ailments, malnourished or bed-ridden and especially those who have some form of motor weakness all are prone to develop pressure sores. From this study it can be concluded that mere frequent changes in posture and arrangement of pressure-alternating devices instead of simple mattresses can prevent pressure ulcers in a large number of patients. This simple prevention should be started from the first day of admission, particularly in remote health-care centers where sophisticated facilities and trained medical staff are not available. Medical and paramedical staff should be taught about the most common sites of pressure ulcer formation and about the importance of back care which they provide in the form of cleaning, thumping etc., so that they can even recognize the early pressure ulcer changes in the body so that treatment can be tailored accordingly. These formal and very simple methods of prevention can be extremely helpful to those patients and their families who are not able to afford expensive medical care because of their poverty.

AUTHORS’ CONTRIBUTIONS

NCK participated in the care of the patients and provided case details, obtained consent, obtained photographs and prepared images. Both NCK and PK reviewed reports and performed literature searches. NCK, SD and HKN, RN and PKN reviewed the literature, analyzed and interpreted the patients’ clinical data and contributed in writing the manuscript. PK assisted in the overall study. All authors read and approved the final manuscript.

References

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