



Rate of Pressure Ulcers in Intensive Units and General Wards of Iranian Hospitals and Methods for Their Detection

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Abstract

Background: This study aimed to estimate the rate of pressure ulcers in intensive care units (ICUs) and medical and surgical wards of Iranian hospitals and compare the performance of methods of medical record review as well as direct observation for their detection.

Methods: The research team visited 308 patients in medical and surgical wards of hospitals affiliated with Tehran University of Medical Sciences and a further 90 patients in their ICUs between March 2009 and April 2010. In addition 310 patient records were randomly selected from patients discharged from the ICUs between March 2009 and April 2010. And a further 600 patient records were randomly selected from the patients that were discharged from medical and surgical wards between March 2010 and April 2011. These 910 selected records were retrospectively reviewed to identify pressure ulcers. Data were collected by a structured checklist.

Results: In ICUs 24 of 90 patients (26.7%, 95% CI: 17.56 to 35.84) that were directly observed and 59 of 310 patients (19.0%, 95% CI: 14.63 to 23.37) that were studied by retrospective review of medical records had pressure ulcers. In medical and surgical wards, 5 of 308 patients (1.6%, 95% CI: 0.20 to 3.00) that were directly observed had pressure ulcers, but no pressure ulcer was detected by review of 600 medical records.

Conclusion: Pressure ulcers are significantly more frequent in ICUs than in medical and surgical wards and a significant proportion of pressure ulcers are not reported.

Keywords: Incidence, Prevalence, Pressure ulcer, Bedsore, Iran

Introduction

Pressure ulcer (also known as bed sore, pressure sore and decubitus ulcer) is a potentially painful consequence of failing in medical and nursing care that commonly occurs in individuals with limited mobility, long hospital stay; severe illness and malnutrition (1-4). Pressure ulcers are considered as a common cause of harm to patients (5-6). They might result in a significant increased length

of institutional stay, reduced quality of patient life, large drain on healthcare resources and mortality (7, 8).

The rate of pressure ulcer varies widely by clinical setting and the methods that are used for their detection. It is argued that the optimum level for pressure ulcer is less than 2% (9), although in some specialties their incidence seems to reach

over 24% (8). Pressure ulcers are normally divided into four stages according to their severity (6). Ulcers with non blanchable skin erythema are considered as stage I, followed by superficial skin loss as stage II, and large wounds involving fat, muscle, and bone as stage III and IV(1).

It is argued that a significant proportion of pressure ulcers are preventable (7, 9). Identifying pressure ulcers and their likely causes is the first step in their prevention. In addition defining the rate of pressure ulcer is a useful tool for comparing healthcare systems and monitoring their improvement programs over time (10). Prevention of pressure ulcers is a fundamental issue in healthcare facilities specially ICU units (10).

Several international studies have been conducted in this area, but the incidence and causes of pressure ulcers have not yet been well identified in Iran and there is an argument about the best methods for identifying pressure ulcers. The aim of this study was to identify the rate of pressure ulcers in ICUs and medical and surgical wards and to compare the performance of medical record review method with direct observation for identifying pressure ulcers in Iranian hospitals.

Materials and Methods

Design

Data collection involved a two-stage (retrospective medical record review and direct observation of patients) using structured checklist. The main outcome measure was the incidence of pressure ulcer.

Setting: The study was conducted in seven general hospitals affiliated with Tehran University of Medical Sciences. All these hospitals had at least a medical and a surgical ward and four of them had at least an ICU unit.

Direct observation of patients

Seven medical and seven surgical wards were selected for direct observation of their hospitalized patients by selecting a medical and a surgical ward randomly from each study hospital. Then during April 2009 the research team visited all the ICUs

and the selected wards to directly observe patients with pressure ulcers. The observed cases included 90 patients in seven ICUs of the four hospitals that had at least one ICU; and 308 patients in seven medical and seven surgical wards. The research team visited all the ICUs during a specific day. We detected the pressure ulcers by speaking with nurses and patients in the selected wards. During this stage a nurse in selected hospitals visited all the study patients and if she found a pressure ulcer then she reported it to the researcher to directly observe the pressure ulcer, then the researcher reviewed the medical records of patient with a pressure ulcer to collect further information.

Review of patient records

In this stage the method we used was a retrospective medical record review. In selected hospitals, 310 patient records were randomly selected from patients that were discharged from the ICUs between March 2009 and April 2010. A further 600 patient records were randomly selected from the patients that were discharged from the medical and surgical wards between March 2010 and April 2011.

These 910 selected records were retrospectively reviewed to identify pressure ulcers. Data were collected by a structured checklist specifically designed for the study. When reviewing medical records, the reviewers looked for evidence of pressure ulcer in the patient records including direct reporting of pressure ulcer or evidence of treatment for pressure ulcer. The sample size was calculated to be able to derive 95% confidence interval around the estimated prevalence of pressure ulcers.

Methods

The data were collected using a structured checklist that included information about the study hospital, study ward, patients and wounds. The study checklist was designed based on the checklists that were used by the Waterlow, Braden and Norton study (11). The study was approved by the ethics committee of Tehran University of Medical

Sciences (TUMS). We also obtained the formal permission of the study hospitals for data collection.

Results

Rate of pressure ulcer in ICU units

In ICUs 24 of 90 patients (26.7%, 95% CI: 17.56 to 35.84) that were directly observed and 59 of 310 patients (19.0%, 95% CI: 14.63 to 23.37) that studied by retrospective review of medical records

had pressure ulcers. The rate of pressure ulcers in ICUs were 26.8% in women and 13.8% in men. Further analysis of the 83 pressure ulcers that were identified in ICUs by direct observation is presented in Table 1 and Table 2.

43.4% of all ICU pressure ulcers occurred in the general ICU of hospital 2, followed by 20.5% of pressure ulcers in heart ICU of hospital 2 and 13.3% of pressure ulcers in neurology ICU of hospital 2 (Table 1).

Table 1: Rate of pressure ulcer in ICUs by type of ICU and type of methods used

Hospital ID (Type of ICU)	Medical record review			Direct observation of patients			Total		
	Number records	Number PU	% PU	Number patients	Number PU	% PU	Number records	Number PU	% PU
Hospital 1 (General)	43	4	6.8	7	2	8.3	50	6	7.2
Hospital 2 (General)	63	27	45.8	18	9	37.5	81	36	43.4
Hospital 2 (Heart)	106	12	20.3	25	5	20.8	131	17	20.5
Hospital 2 (Neurology)	34	7	11.9	12	4	16.7	46	11	13.3
Hospital 3 (General)	37	6	10.2	12	2	8.3	49	8	9.6
Hospital 3 (Neurology)	0	0	0.0	8	1	4.2	20	1	1.2
Hospital 4 (General)	15	3	5.1	8	1	4.2	23	4	4.8
Total	310	59	100.0	90	24	100.0	400	83	100.0

PU=pressure ulcer

Table 2: Association between occurrence of pressure ulcer and type of methods used

Hospital ID (Type of ICU)	Medical record review			Direct observation of patients			Total		
	Number records	Number PU	% PU	Number patients	Number PU	% PU	Number records	Number PU	% PU
Hospital 1 (General)	43	4	9.3	7	2	28.6	50	6	12.0
Hospital 2 (General)	63	27	42.9	18	9	50.0	81	36	44.4
Hospital 2 (Heart)	106	12	11.3	25	5	20.0	131	17	13.0
Hospital 2 (Neurology)	34	7	20.6	12	4	33.3	46	11	23.9
Hospital 3 (General)	37	6	16.2	12	2	16.7	49	8	16.3
Hospital 3 (Neurology)	0	0	0.0	8	1	12.5	20	1	5.0
Hospital 4 (General)	15	3	20.0	8	1	12.5	23	4	17.4
Total	310	59	19.0	90	24	26.7	400	83	20.8

PU=pressure ulcer

In addition in the general ICU of hospital 2, 44.4% of all ICU admissions were associated with at least a pressure ulcer; followed by 23.9% of admissions in neurology ICU of hospital 2; 17.4% of admissions in general ICU of hospital 4; and 16.3% of admissions in general ICU of hospital 3; ($P < 0.05$), (Table 2).

There was no statistically significant association between pressure ulcers and type of admission (emergency or elective), duration of anesthesia, history of kidney disease, history of smoking, history of thyroid disease, history of digestive disease and obesity. Occurrence of pressure ulcer had a statistically significant association with patient age, lengths of stay, and presence of blood pressure, fever, lung disease and paralysis.

Rate of pressure ulcer in medical and surgical wards

In medical and surgical wards, 5 of 308 patients (1.6%, 95% CI: 0.20 to 3.00) that were directly observed had pressure ulcers, but no pressure ulcer was detected by review of 600 medical records (0%, 95% CI: 0.00 to 0.00). Table 1 shows the frequency of patients with pressure ulcer in each hospital. Three of the 5 patients with pressure ulcers were male, two of them were over 80 years of old, 3 had severe limited mobility and 2 had severe unconsciousness. Three of these pressure ulcers were from the surgical wards and 4 pressure ulcers occurred in hip area. Due to the low frequency of pressure ulcers in general wards further analysis of their types and contributory factors were not conducted (Table 3).

Table 3: Frequency of patients with pressure ulcer in medical and surgical wards by hospital

Hospital ID	Number of observation (Number of bedsores)	Number of record review (Number of bedsores)	Total reviews (Total bedsores)
Hospital 1	47 (0)	121 (0)	168 (0)
Hospital 2	29 (0)	97 (0)	126 (0)
Hospital 3	112 (1)	112 (0)	224 (1)
Hospital 4	23 (2)	75 (0)	98 (2)
Hospital 5	51 (1)	95 (0)	146 (1)
Hospital 6	23 (0)	100 (0)	123 (0)
Hospital 7	23 (1)	0 (0)	23 (1)
Total	308 (5)	600 (0)	908 (5)

Discussion

This study showed that in ICUs 26.7% of patients that were directly observed and 19.0% of patients that were studied by retrospective review of medical records developed at least a pressure ulcer. In addition in the medical and surgical wards 1.6% of patients that were directly observed had pressure ulcers, but no pressure ulcer was detected by review of medical records. These findings are comparable with the results of other international studies (3, 12- 13). The incidence and prevalence of pressure ulcers vary widely depending on the type of hospital, type of specialty, patient socio demographic status and hospital case mix (5, 14). It is argued that the optimal rate of pressure ulcers

should be less than 2%(9), but their incidence have been reported between 2.3% and 23.9% in long-term care facilities, between 0.4% and 38% in acute care facilities, between 0% and 17% in home care and between 0% and 6% in rehabilitative care(8, 13). Other studies have reported the rate of pressure ulcers as 3% to 22% in hospitalized patients, 2% to more than 20% in nursing homes and 14 to 44% in ICUs(3). These suggest that pressure ulcers are significantly more frequent in ICUs than in medical and surgical wards. Also as expected, a significant proportion of pressure ulcers are not reported in medical records which might lead to the underestimation of the rate of pressure ulcers when using this method. This shows that in many hospitals the low rate of pres-

sure ulcer might be partly due to the poor documentation (15).

We found that pressure ulcer had a statistically significant association with patient age, lengths of stay, and presence of blood pressure, fever, lung disease and paralysis. Other studies have also shown that pressure ulcer had a statistically significant correlation with malnutrition, incontinence (16,17), longer stay, limited mobility (16, 18-20), duration of surgery, number of operation and sever instability (3,21-22). In addition critically ill patients and patients with higher blood urea, diabetes, spinal cord injury, and renal insufficiency had a higher risk of pressure ulcer (23). Tannen and Dassen also reported that age and the lengths of hospital stay were the most important factors contributing to the occurrence of pressure ulcers that is in line with the findings of our study (24). This study is the first study that has been performed on the prevalence of pressure ulcer in ICUs and internal and surgical wards of hospitals affiliated to TUMS in Iran. The study has used a combination of direct observation and medical record review with a relatively large sample size to achieve a more accurate and reliable estimate.

The limitations of the study

The results obtained from hospitals of Tehran might not be generalized to the whole country. In addition it was possible that some pressure ulcers have not been reported in the medical records or reported inadequately and this might have led to the underestimation of the problem. This might need further investigation in the new studies.

Conclusion

Pressure ulcers are significantly more frequent in ICUs than in medical and surgical wards and a significant proportion of pressure ulcers are not reported. This study made a significant contribution to the understanding of pressure ulcers. This will not automatically result in reducing pressure ulcers and their consequences but may provide

important information as to how to move forward to achieve this aim.

Ethical considerations

Ethical issues (Including plagiarism, Informed Consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy, etc.) have been completely observed by the authors.

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