Audit

Pressure sores following elective total hip arthroplasty: pitfalls of misinterpretation

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Objective: To assess the reliability of reporting protocols regarding pressure sores.

Methods: Retrospective data were collected regarding pressure sore rates following total hip arthroplasty operations carried out during 2001 at two orthopaedic units in an NHS hospital (Princess Royal Hospital) and in a local private hospital.

Results: Preliminary results presented in audit and interim reports indicated an alarmingly high pressure sore rate across the two sites (17/172 [9.9%] NHS, 23/71 [32.4%] private hospital). On analysis, the data collection system was revealed to be flawed. Grade 1 areas (erythema with no ulceration) were included, leading to a dramatic discrepancy between reported and confirmed pressure sores. Re-analysis showed the confirmed pressure sore rates to be much lower (2.3% NHS, 1.0% private hospital).

Conclusions: This audit suggests that both poor data collection and education lead to inaccurate audit. This may lead to subsequent inappropriate management and inappropriate NHS star ratings.

Key words: Pressure sore – Total hip arthroplasty – Co-morbidity – Risk factors – Data collection – Medical audit

The UK incidence of pressure sores after total hip arthroplasty is estimated to be 4.3–8%.^{1,2} The estimated cost of caring for pressure sores is estimated at £150 million a year in the UK and more than \$3 billion in the US.² Pressure sore incidence is recognised as a marker of quality of care:¹ it is included in audit reports and may be used to formulate NHS star ratings.³

The aim of this audit was to compare the actual with the reported incidence of pressure sores across two units. We sought to determine if there was inappropriate reporting of pressure sores due to classification errors and whether there were differences between manual and computer-generated figures.⁴

Patients and Methods

Hospitals

We analysed recorded data on all recorded primary elective total hip arthroplasties carried out in 2001 by four consultant orthopaedic surgeons working across two sites – the Princess Royal Hospital (NHS) and a local private unit (PU).

Data

Pressure sores were noted by nursing staff and a tissue viability nurse reviewed the data as part of the normal

Table 1 Classification of pressure sores

Stage	Criteria
I	Non-blanching, persistent erythema of intact skin. Reversible
II	Partial thickness skin loss involving epidermis and/or dermis
III	Full thickness skin loss. Damage to subcutaneous tissue. Not involving underlying fascia
IV	Extensive destruction to muscle, bone or supporting structures. Life-threatening

reporting protocol. The data were entered into a computer database.

Pressure sore prevention

The four surgeons' individual protocols varied slightly in terms of preferences for length of stay in bed postoperatively (according to operative approach) and antithromboembolic prophylaxis (low-molecular weight heparin protocols). However, all patients underwent similar pre-assessment checks involving nursing, surgical and anaesthetic teams where appropriate.

All patients received antithromboembolic stockings, although different brands were used at the hospitals – NHS (Brevet) and PU (Medi). Pressure-relieving mattresses were used in both hospitals (Alpha xcell, Propad [NHS]; Alpha xcell, Improtect [PU]). Whenever possible, patients were placed directly onto these mattresses in the recovery unit following surgery. The patients who developed pressure sores had similar co-morbid factors at both hospitals and were not known to have had prolonged periods of hypoxia.

Both hospitals had surveillance protocols in place to monitor new pressure sore development. Peri-operative risk factors were measured using standard risk scales, Braden (1985, US) and Waterlow (1984, UK).⁵ Pressure sores were graded according to the criteria shown in Table 1. This follows advice from the American National Pressure Ulcer Advisory Panel^{2,6} and matches that of the International Association for Enterostomal Therapists' classification.⁶

Table 2 Preliminary results of reported pressure sores

Site	Princess Royal Hospital	Private unit
Total reported THsA 2001	172	71
Total pressure sores	17/172 (9.9%)	23/71 (32.4%)
Heel sores	5/172 (2.9%)	19/71 (26.8%)
Sacral/buttock sores	12/172 (7.0%)	4/71 (5.6%)

Nursing staff

Both units had similar nursing staff levels and experience. Nurse-to-patient ratios were 1:4–6 (NHS) and 1:5–7 (PU), respectively. Staffing levels remained satisfactory throughout the audit period. In addition, an Intensive Home Nursing Service (IHNS) was in place to optimise patient discharge following surgery at both hospitals, which saw average stays fall from 10 to 6 days during 2001.

Results

Reported pressure sore incidence

The data generated from completed hospital surveillance projects are shown in Table 2. Across the two sites, a total of 243 total hip arthroplasty operations were performed.

These preliminary results indicate a high pressure sore development rate across the two sites. Compared to the 4.3% national average, rates of 9.9% (NHS) and 32.4% (PU) were reported. The difference in overall pressure sore rates between the two units was significant ($P < 0.001$). Despite similar surgeons, methods, peri-operative factors and protocols, differing rates for pressure sore sites were found for heel sores (2.9% NHS; 26.8% PU) and sacral/buttock sores (7.0% NHS; 5.6% PU).

Across both sites, there was a higher incidence of pressure sores of the heel if the posterior approach to the hip was used (see Table 3). This was thought to be due to the longer period of postoperative immobility required by agreed protocol (2 days for lateral approach and 5 days for posterior approach).

Pressure sores also occurred in significant numbers on the unoperated heel, whether or not the operated leg was involved.

Actual pressure sore incidence

Reviewing recorded data, we found that grade I pressure sores were included in the final calculation for audit figures at both hospitals. This practice is erroneous, as this grade does not reflect active ulceration. It is a subjective measurement used for the identification of at-risk areas for pressure sore prevention.

Table 3 Breakdown of data for heel sores

Site	Princess Royal Hospital	Private unit
Total heel sores 2001	5	19
Posterior approach	4/5 (80%)	11/19 (57.9%)
Heel sore on unoperated leg/both	2/5 (40%)	7/19 (36.8%)

Also, manual verification of total hip arthroplasty operations with theatre logbook entries revealed a discrepancy in the private unit figures. At the PU, 97 total hip arthroplasties were identified rather than the 71 reported. We re-analysed the data to take these factors into account; the final results are shown in Table 4. The difference in overall pressure sore rate between the two units was not statistically significant. Due to the small number of actual pressure sores, further analysis of heel sores was not possible.

Discussion and Conclusions

Reported pressure sore rates

The national average pressure sore rate is 4.3–8%. Returned data from the two hospitals in our study indicated pressure sore rates of 9.9% and 32.4% in the two hospitals. This high rate would normally indicate poor practice and be a cause for concern. This is likely to be reflected in poor league table ratings.

Actual pressure sore rate

Once data had been corrected, the true rate of pressure sores was measured at 2.3% and 1% in the two hospitals. These rates were better than the national average data.

Implications

A high complication rate often indicates scrupulous data collection.⁴ This was true of reported data from the PU in our study. When coupled with incomplete data, as was found in our study, the analysis of referenced data becomes very difficult. This leads us to believe league tables and star ratings ought to be analysed with caution.

Other implications

As audit results have effects on resource allocation and preventative efforts, this illustrates several key points of effective clinical governance. Data collection should not start before standard reporting criteria have been established. Data should not be considered trustworthy until confirmed. The results should reflect what was agreed at the start of data collection in areas such as classification and patient inclusion criteria. The concern is that the accumulation of these errors across different key targets and hospital specialities would render any star

Table 4 Comparison of reported and confirmed pressure sores

	Princess Royal Hospital		Private unit	
	Reported	Actual	Reported	Actual
Total hip arthroplasties 2001	172	172	71	97
Pressure sore incidence	9.9%	2.3%	32.4%	1.0%
Heel sores	2.9%	0.6%	26.8%	1.0%
Sacral/buttock sores	7%	1.7%	5.6%	0%

ratings derived from these performance indicators probably untrue.

Further work

Although the collected data were re-assessed, re-education of the staff who assess pressure sores and collect data is needed to close the audit loop. Following this, re-audit of the accuracy of this data would be needed.

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