

A hip fracture nurse specialist has a positive outcome on the length of stay for patients with hip fractures

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SUMMARY: A hip fracture nurse specialist has a positive outcome on the length of stay for patients with hip fractures.

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Aim. To determine if recruitment of a hip fracture nurse specialist has a reduction in length of stay for hip fracture patients.

Method. Primary data was extracted from the National Hip Fracture Database (NHFD). The length of stay of hip fracture patients from 2011-2014 was compared to the period 2014-17, following appointment of a hip fracture nurse specialist in 2014.

Results. The average length of stay in the first group (2011-

2014) was 19.94 days and in the second group (2014-2017) was 16.52 days. There was a reduction of 3.42 days (17.15%) and was statistically significant.

There was also a reduction in the time to surgery (1.38 days versus 1.15 days) and the crude 30-day mortality (10% versus 6.06%) both of which were statistically significant. The two groups were well-matched with regards to age, female: male ratio and severity of co-morbidities (based on American Society of Anaesthesiologists physical status classification system).

Conclusion. The introduction of a dedicated hip fracture nurse specialist has a positive outcome on hip fracture patients by reducing length of stay, time to surgery and the crude 30-day mortality.

KEY WORDS: Length of stay - Fracture neck of femur nurse specialist - Time to surgery - 30-day mortality - Fracture neck of femur.

Introduction

It is estimated that annually more than 50,000 patients sustain hip fractures or fractured neck of femur (NoF) in the UK (1) and is therefore a significant burden to the healthcare system. According to the National Hip Fracture Database Annual Report 2018, fractured NoF accounts for one and a half million hospital bed days and costs over £1 billion per year (2). Hip fracture incidence is expected to reach 6.3 million by 2050. (3)

This is a complex patient group which needs multidisciplinary approach and guidelines for a successful outcome.

The Scottish Hip fracture audit, SIGN 56, which reviewed management of hip fracture patients in Scotland developed guidelines to improve outcomes in this group of patients.

An important aspect of the guidelines was that hip fracture patients should be operated upon and seen by a physician in the ward within 24 hours of admission. Also, there should be early discharge planning and the surgical and rehabilitation outcomes should be continually audited.

Best Practice Tariff Criteria serves a similar purpose. The key clinical characteristics of best practice were chosen by a group of clinicians and service managers chaired by the National Clinical Director for trauma care. The characteristics are applied to patients aged over 60 years of age and key recommendations are: time to surgery being within 36 hours from arrival in the emergency department; admission under the joint care of a consultant geriatrician and a consultant orthopaedic surgeon; postop-

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erative geriatrician-directed multi-professional rehabilitation team and fracture prevention assessments (falls and bone health).

It is established that a combined Orthogeriatric and Orthopaedic care produces the best outcome for these patients (4). Any innovation to reduce length of stay (LoS) would enhance patient experience and contribute to efficiency savings. With this objective in mind and also to improve other Key Performance Indicators, a hip fracture clinical nurse specialist (CNS) was appointed in 2014 in our district general hospital.

Previous studies have examined the role of integrated Orthogeriatric care but very few have specifically looked into the role of the specialist hip fracture nurse (5, 6), and the ones that have reviewed this have been done with small numbers and over a much shorter period of time (7).

Williams and Sibbald found that role ambiguity in the acute clinical setting challenges existing role boundaries and may contribute to negative attitudes about nurse practitioner (NP) roles (6).

Studies have not only showed reduction in length of stay and time to surgery but also a reduction in post-operative complications with the introduction of nurse specialist. Moran et al. in their study of 589 patients with a follow-up of 33 months after surgery for hip fracture showed a reduction in post-operative complications from 60% to 10% in the cohort with the nurse specialist (8).

The Fractured Hip Management Programme in Western Sydney has a nurse co-ordinator in a pivotal role. It has shown that patients received surgery sooner and spent less time in hospital, without adverse effects on outcome. There is increasing recognition of the role of the nurse specialist as a patient advocate and thereby improving care (9).

In 2012, Forster showed a reduction in LoS by 10 days in a sample of 387 hip fracture patients (10). In a similar study by Holte et al., data from 2001 to 2005 was compared with data from 2006 to 2010 when NPs were hired. Adding NPs to the orthopaedic team decreased the LoS by 2.2 days without increasing mortality or readmission rates (11).

The challenge is to balance efficient, cost-effective care with holistic, safe care. Similarly, balancing LoS with readmission rates is important.

The NP helps facilitate a decrease in the time to surgery and therefore LoS by coordinating medical and critical care teams who make recommendations for management of the patient.

The CNS in our hospital facilitates multi-disciplinary team working and co-ordinates the care of these patients from admission to discharge. More specifically, the hip fracture CNS meets the patients on the trauma list prior to the trauma meeting at 8am. The patients' cognition, observations, blood tests and medication are assessed; they are advised about what to expect and the information about their next of kin is updated, and perioperative optimization and communication with operating room staff is addressed.

After the trauma meeting, any additional investigations such as echocardiograms that are needed are requested, and the CNS liaises with the Orthogeriatric team and other departments if required (for example, cardiology consult for patients with pacemakers). At 9am the CNS participates in the MDT for discharge planning. Following this, the CNS checks the progress of the trauma list and helps to address and bottlenecks that may have arisen. They remain a point of contact for the patient and their relatives even after discharge.

Besides their clinical role, the CNS has other roles including -data entry into NHFD, auditing patient outcomes and presenting these at relevant monthly meetings and also education, mentoring and training of nursing staff, other nurse specialists and junior doctors.

Material and methods

As in several other centres, hip fracture patients are admitted directly to the orthopaedic ward from the ambulance (via X-ray) once they meet the criteria. These include age more than 65 years, low-trauma injury, high index of clinical suspicion of hip fracture (for example a shortened and externally rotated leg) and a conscious patient with no other life-threatening injuries.

The type of surgical procedures performed included dynamic hip screw fixation, percutaneous screw fixation, intramedullary nailing, bipolar hemi

arthroplasty, and total hip arthroplasty. These procedures were chosen by the consultant supervising the procedure based on fracture type.

From October 2011 to September 2014 prior to introduction of the CNS, there were a total of 1084 patients with fractured NoF, of which 1019 had surgery. From October 2014 to September 2017 there were a total of 1099 patients of which 1083 had surgery. Patient demographics (age and gender), use of cement and ASA grades were determined from the National Hip fracture database. Primary outcomes assessed were total length of stay, time to surgery and crude 30-day mortality.

Statistical analysis was done using the 't' test (age, length of stay, time to surgery and 30-day mortality). The Fisher test was used for female:male ratio comparison and the Man-Whitney U test for ASA grade comparison (Table 1).

There was no statistically significant difference between the ASA grades, age or female:male ratio in the two groups. In the first group 74% were females and in the second group 72%.

The mean total length of stay for the period 2011-14 was 19.94 days and for 2014-17 it was 16.52 days. The difference of 3.42 days was statistically significant ($p=0.0001$). The crude 30-day mortality for the period 2011-14 was 10% when com-

pared to 6.06 % for the period 2014-2017. The difference of 3.94% was statistically significant ($p=0.001$).

From 2011-14 there were 649 hemi-arthroplasties, of which 221(34%) were cemented. From 2014-17 there were a total of 591 hemi-arthroplasties, of which 505(85%) were cemented. The difference was found to be statistically significant ($p=0.001$). In the yearly breakdown for the second group, the proportion of cemented hemi-arthroplasty was 65% in 2015, 93% in 2016 and 97% in 2017.

Discussion

The Princess Royal University Hospital is a district general hospital that caters mainly to the London Borough of Bromley with a population of 305,246, of which 16.7% are over 65 years of age (12). The factors affecting length of stay are patient co-morbidities, time to surgery, timing of Orthogeriatrician and physiotherapy input, and arranging placement. LoS is a Key Performance Indicator in the NHFD.

Reducing the LoS has several benefits; it reduces the chances of the patient developing post-operative

TABLE 1 - RESULTS TABLE AND ASA GRADING TABLE.

Results	2011-2014	2014-2017	p-value	National average
Age (mean)	84.17	83.68	0.1917	
Length of stay (days)	19.94	16.52	0.0001	20
Time to surgery (days)	1.38	1.15	0.0001	
Female:male	761:260	786:298	0.2998	
30-day mortality	10%	6.06%	0.001	6.9%

ASA grades	2011-14	2014-17
ASA 1	24	23
ASA 2	281	266
ASA 3	570	627
ASA 4	189	100
ASA 5	20	3

complications such as pneumonia and thromboembolism. It also provides efficiency savings to the trust and means more beds become available.

The introduction of the CNS role into orthopaedic surgery has been clearly shown to benefit hip fracture patients. The reduction in LoS is a testament to the importance of daily case management and co-ordination of care. The collaboration of the CNS with the multidisciplinary team provides the patient with the resources needed to maximise functional recovery.

According to the NHFD, the UK-wide mean length of stay in a Trust is 20 days, whereas ours has improved from 19.94 to 16.03 days. However, the success with decreased length of stay should not be offset by the increase in mortality or increased readmission rates. While the data for readmissions was not available, the crude 30-day mortality decreased from 10% in the 2011-14 group to 6.06% in the 2014-17 group and is now less than the national average of 6.9%.

Several studies have demonstrated that a delay to surgery is associated with delay to discharge (13-16). Lau et al. demonstrated that by decreasing the time to surgery from 6.1 days to 1.5 days hospital LoS was reduced by 5.7 days (15). Holte et al. found that when adjusted for ASA score, age and gender it was found that for every day longer from admission to surgery, the LoS increased by 1.4 days (11). Prompt surgery (90% by the following day) is recommended by NICE CG124 and QS16 and is a Key Perfor-

mance Indicator (17). However, across the UK only 70% had surgery within 72 hours. Though this data was not available for all of our patients, the average time to surgery reduced from 1.38 days to 1.15 days and the difference was statistically significant ($p=0.0001$).

Limitations

Prior to the CNS joining the team there was no dedicated person to enter the data into the NHF database. As a consequence, data is incomplete for some parameters pre-2014, such as proportion of patients having had surgery within 72 hours of admission. In accordance with NICE guidelines, we are doing more cemented hemiarthroplasties, which is known to cause potential post-op complications and possible delay in discharge as a consequence of this. The data regarding reason for delay, (for example administrative/ over-run or medical) was also incomplete which may have introduced a bias as there was a change in management in 2015. Another limitation of the study is the lack of readmission data.

Conclusion

Introduction of the hip fracture clinical nurse specialist in our hospital has had a positive impact in terms of time to surgery, length of stay and mortality.

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