

Epidemiology of Orthopaedic Trauma Admissions Over One Year in a District General Hospital in England

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Abstract: *Introduction:* Admission to district general hospitals in England has undergone change in recent years due to both an aging population and the reconfiguration of the major trauma network throughout the United Kingdom.

Methods: We utilised a retrospective cohort study to analyse the epidemiology over a 12-month period at a district general hospital. Data was collected and divided into groups: upper limb, lower limb, vertebral disc disease, vertebral fracture, cellulitis without bone involvement and deep infection including metalwork.

Results: 2817 patients were admitted over the 12-month period. There were 893 upper limb fractures, 1511 lower limb fractures, 126 vertebral disc disease, 55 vertebral fractures, 108 cellulitis without bone involvement and 124 deep infections with 19 admissions not specified due to coding. AN average of 242 patients were admitted each month with the majority admitted during the summer months.

Conclusion: Although fractures make up the majority of the reason for which a person is admitted, there are also many other injuries/morbidities, which may necessitate admission. There is an increasing incidence of elderly osteoporotic fractures in females, which is balancing out the previously more common fractures seen in younger adults and adolescents.

Keywords: Admissions, epidemiology, fracture, infection, orthopaedics, trauma.

INTRODUCTION

The make-up of patients who are admitted to hospital for a fracture or other orthopaedic injury is changing. The population is getting older with a resultant increase in the number of osteoporotic fractures as well as complications from previous operations, most commonly hip or knee replacements. Admission data for district general hospitals in the United Kingdom has also changed as a result of the introduction of major trauma centres and trauma network reconfiguration.

There are few papers looking at all orthopaedic trauma admissions, with previous papers focusing on purely fracture epidemiology. The classic paper looking at this is the Bühr and Cooke paper from 1959 looking into fracture epidemiology, with a number of similar studies being undertaken since then [1-3]. There are no relevant studies looking at all trauma admissions including, for example, soft tissue injury/infection or intervertebral disc prolapse in the spine. Knowledge of the entire trauma workload at district hospitals is key to not only manage resources but to also tailor training opportunities for surgeons and predict areas where allocation of resources could improve patient care within the constraints of the current hospital budget.

To clearly define the epidemiology of the normal orthopaedic take we have used a retrospective model of all

patients admitted under the orthopaedic trauma team over a 1 year period from September 2013 to September 2014. We have analysed the reason for admission and the subsequent demographics of patients admitted.

METHOD

We undertook a retrospective cohort study of consecutive patients admitted to a single centre between September 2013 to September 2014. Using data collected during coding, patient notes as well as all the trauma operations we compiled a database of all the categories of patients requiring admission.

We included all patients who were admitted under the direct care of the orthopaedic team, irrespective of what treatment they ultimately ended up having. This did not include patients who were consulted on for other specialties or those who were only reviewed in the Emergency Department but then subsequently discharged from hospital.

All soft tissue injuries, as well as spinal problems were included in the analysis.

Previous studies have grouped injuries into specific anatomical locations, and we have thus endeavoured to do the same [4]. We divided the injury classifications into upper limb fractures, lower limb fractures, vertebral fractures, spinal disc disease, cellulitis with no bone involvement and infected prosthesis/metalwork.

To ensure the accuracy of each of the cases we looked through the discharge letter sent to the GP to ensure accuracy of the diagnosis.

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RESULTS

Analysis of the patient presentations during the year from September 2013 through to September 2014 showed that there were 2817 patients admitted under the orthopaedic team. The average age of these patients was 53.12 years with a gender ratio of 51:49 Male to Female.

There were 893 upper limb fractures, 1511 lower limb fractures, 126 vertebral disc disease, 55 vertebral fractures, 108 cellulitis without bone involvement and 124 deep infections with 19 admissions not specified due to coding. (Table 1).

Table 1. Location of injury/trauma causing admission.

| Location of Injury/ Trauma Causing Admission | Number of Patients |
|---|--------------------|
| Upper limb | 893 |
| Lower limb | 1511 |
| Spinal non bony | 126 |
| Spinal bony | 55 |
| Cellulitis | 108 |
| Not specified | 19 |
| Infected prosthesis/metalwork | 124 |

There was a bimodal distribution of patient age. The admission rates were higher for children and young adults up to the age of 19 years old, as well as for those above 70 years old (Table 2).

Table 2. Age of patients admitted with trauma.

| Age | Number of Patients |
|------------|--------------------|
| 0 to 9 | 203 |
| 10 to 19 | 271 |
| 20 to 29 | 268 |
| 30 to 39 | 210 |
| 40 to 49 | 299 |
| 50 to 59 | 317 |
| 60 to 69 | 303 |
| 70 to 79 | 355 |
| 80 to 89 | 480 |
| 90 to 99 | 202 |
| 100 to 109 | 1 |

We found that the average length of stay for patients was firstly very dependent on the type of injury sustained, but also that generally most patients stayed less than 5 days as an inpatient (1928 patients) compared to 978 patients staying longer than this. There were 87 patients who stayed over one month as an inpatient and one patient who stayed 105 days in total (Table 3).

Table 3. Length of stay for trauma patients from September 2013-August 2014.

| Length of Stay | Patients |
|----------------|----------|
| 0 days | 708 |
| 1 day | 539 |
| 2 days | 273 |
| 3 days | 160 |
| 4 days | 119 |
| 5 days | 129 |
| 6 days | 83 |
| 7 days | 80 |
| 8 days | 79 |
| 9 days | 88 |
| 10 days | 76 |
| 11 days | 80 |
| 12 days | 45 |
| 13 days | 50 |
| 14 days | 47 |
| 15 days | 31 |
| 16 days | 29 |
| 17 days | 25 |
| 18 days | 22 |
| 19 days | 25 |
| 20 days | 26 |
| 21 days | 22 |
| 22 days | 12 |
| 23 days | 20 |
| 24 days | 16 |
| 25 days | 10 |
| 26 days | 6 |
| 27 days | 4 |
| 28 days | 8 |
| 29 days | 7 |
| 30 days | 6 |
| 31 to 35 | 14 |
| 36 to 40 | 23 |
| 41 to 45 | 10 |
| 46 to 50 | 10 |
| 51 to 55 | 9 |
| 56 to 60 | 5 |
| 61 to 65 | 3 |
| 66 to 70 | 6 |
| 105 days | 1 |

Throughout the year there was a relatively even number of patients admitted each month, with the average being 242 patients admitted. Surprisingly the month when most patients

were admitted was June 2014 when 279 patients were admitted, potentially relating to summer activities (Table 4).

Table 4. Total number of trauma patients admitted per month.

| Month | Number of Patients |
|--------|--------------------|
| Sep-13 | 245 |
| Oct-13 | 232 |
| Nov-13 | 231 |
| Dec-13 | 241 |
| Jan-14 | 237 |
| Feb-14 | 191 |
| Mar-14 | 261 |
| Apr-14 | 226 |
| May-14 | 245 |
| Jun-14 | 279 |
| Jul-14 | 277 |
| Aug-14 | 243 |

DISCUSSION

Although previously it has commonly been thought that it is young males who end up being admitted under the orthopaedic team for certain fractures, the reality is that there are many other reasons for which a patient could potentially be admitted. Although fractures make up the majority of the reason for which a person is admitted, there are also many other injuries/morbidities which may necessitate admission.

The data also shows that generally patients receive treatment in a very timely manner with the majority of patients being treated and discharged from hospital within 5 days of admission, with a significant number also being treated and discharged on the same day of admission.

Throughout the year there was a reasonably steady number of admissions, roughly between 230 and 270 patients per month. The highest numbers were in the summer months. This may be a reflection on the warmer summer than average of 2014 causing more people to injure themselves outdoors, or potentially a warmer winter of 2013-2014 where there was less ice, thus less opportunity to injure oneself. Previous articles have shown that the number of paediatric admissions goes up with good weather, whereas adverse weather conditions cause children to stay indoors and thus the risk of injury is lower [5]. Within the adult population it has been found that those over the age of 65 and with a hip fracture have a much higher incidence with a worse prognosis if they are admitted when the weather is worse [6].

We found that the gender demographics match those of similar previous studies with a 51:49 split male to female ratio. Other studies have shown that there is a 50:50 gender distribution for example in the Court-Brown study of 2006 [7]. This is due to a higher number of younger male traumatic injuries being balanced out by the osteoporotic fractures sustained by elderly females.

CONCLUSION

Our results show that there is an increasing incidence of elderly osteoporotic fractures in females which is balancing out the previously more common fractures seen in younger adults and adolescents. This has led to a more even gender distribution with a higher average age of patient.

We have also found that although there are numerous other reasons why a patient may be admitted under the orthopaedic team, by far the most common is due to a fracture.

Finally we have found that although there are a consistently high level of admissions, most are dealt with in a timely manner and have their presenting complaint treated within 5 days of admission.

CONFLICT OF INTEREST

The authors confirm that this article content has no conflict of interest.

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