Hip Fractures: The St Ann's Bay Regional Hospital Experience

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ABSTRACT

Objectives: *To study the outcome of hip fractures in a cohort of patients from two different time periods (2002–2003 and 2006–2008).*

Methods: *Patients treated for hip fractures at the St Ann's Bay Regional Hospital, which provides orthopaedic care for the parishes of St Ann, St Mary and Portland, were retrospectively analysed between 2002–2003 and 2006–2008.*

Results: *A significant increase in the recorded incidence of hip fractures, from 19 in the 2002–2003 time period to 101 in the 2006–2008 time period was noted. There was a drastic fall in the in-hospital mortality rate (43% in the 2002–2003 time period compared to 4.5% in the 2006–2008 time period). In the 2006–2008 period, 82.9% of patients were ambulant at discharge compared to 36% from the 2002–2003 time period.*

Conclusion: *Early surgical fixation is necessary to allow rapid mobilization in these patients for whom the consequences of bed rest would otherwise be devastating.*

Keywords: Hemiarthroplasty, hip fractures, osteoporosis.

Fracturas de Cadera: Experiencia del Hospital Regional de Saint Ann's Bay

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RESUMEN

Objetivos: *Estudiar el resultado de las fracturas de cadera en una cohorte de pacientes de dos diferentes períodos de tiempo (2002–2003 y 2006–2008).*

Métodos: *Los pacientes tratados por fracturas de cadera en el Hospital Regional de Saint Ann's Bay, que brinda atención ortopédica a las parroquias de Saint Ann, Saint Mary y Portland, fueron analizados retrospectivamente entre 2002–2003 y 2006–2008.*

Resultados: *Se observó un aumento significativo en la incidencia de fracturas de cadera, de 19 en el período de 2002–2003, a 101 en el período de 2006–2008. Hubo una drástica caída en la tasa de mortalidad intrahospitalaria (43% en el período de 2002–2003 en comparación con un 4.5% en el período de 2006–2008). En el período de 2006–2008, 82.9% de los pacientes eran ambulatorios a la hora del alta, en comparación con el 36% del período de 2002–2003.*

Conclusión: *Se requiere una fijación quirúrgica temprana a fin de permitir la rápida movilización en estos pacientes, para quienes el reposo en cama tendría consecuencias devastadoras.*

Palabras claves: Hemiartroplastia, fracturas de cadera, osteoporosis

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INTRODUCTION

In 1891, the earliest recorded attempts at hip replacement surgery was performed by T Gluck in Germany by using ivory to replace the femoral head (1). In 1940 at the Johns Hopkins hospital, Austin T Moore, an American surgeon, reported and performed the first metallic hip replacement surgery. His original design, a prosthesis with a proximal femoral replacement and a large fixed head, was made of the cobalt-chrome/vitallium alloy. A later version of Moore's prosthesis, Austin Moore prosthesis, developed in Columbia, South Carolina, was introduced in 1952 and is still utilized today (1). Although there are other implants available today,

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the Austin Moore prosthesis is routinely used at the St Ann's Bay Regional Hospital (SABRH) due to its affordability and availability.

The Orthopaedic Department at the SABRH attends to patients from the parishes of St Ann, St Mary and Portland. These three parishes have a combined population of approximately 370 000, of which approximately 32 000 are over the age of 65 years (2).

The incidence of hip fracture increases exponentially with age for both men and women, with osteoporosis playing a central role in the pathogenesis. Visual impairment, dementia, Parkinsonism, physical inactivity and the use of psychotropic medications are all associated with a greater risk of hip fractures (3). Hip fracture is a serious consequence of falls in senior citizens, with mortality rates of 10% at one month, 20% at four months and 30% at one year (4).

Although surgical intervention has been possible for many decades, the majority of the population that utilized the SABRH prior to 2002 was ignorant of this. Most of these patients who suffered hip fractures would develop complications and die at home or come to the SABRH to be treated for complications resulting from extended bed rest, at which time the hip fracture was diagnosed. This study aimed to assess the outcome of hip fractures in a cohort of patients from two different time periods: 2002–2003 and 2006–2008.

SUBJECTS AND METHOD

Patients treated for hip fractures at the SABRH between 2002–2003 and 2006–2008 were retrospectively analysed. Subtrochanteric fractures were not included in the group studied. Educating the population of the possibility of surgical intervention was carried out in 2002. They were educated primarily through the general practitioners practising in the region.

All patients were admitted, placed on traction and prepared for surgery at the SABRH or at an institution with an image intensifier in the case of those who had intertrochanteric fractures. Not all patients gave consent for surgery. Preoperative and postoperative deep vein thrombosis (DVT) prophylaxis was given to all patients. Low molecular weight heparin was the drug of choice, however, unfractionated heparin was given to those patients who could not afford low molecular weight heparin.

After the analysis of the 2002–2003 records, the following modifications were made to the management strategies in an effort to have more favourable outcomes:

- The hospital administration was asked to provide a stock of implants
- Attempt to administer prophylactic low molecular weight heparin to all patients
- Administer Mental Status Examination and Pre-morbid Status Evaluation by admitting orthopaedic officer
- Early medical and anaesthetic evaluation in an attempt to have the patient prepared for surgery as soon as possible
- Aim to get patient back to pre-morbid functional level
- Rigorous postoperative management (intravenous fluids (IVF), analgesics and increased oral intake)
- Supervised postoperative physiotherapy

RESULTS

2002–2003

There were 19 patients that presented with hip fractures; female to male ratio was 1.37:1. There were 12 femoral neck fractures and seven intertrochanteric fractures (Fig. 1), of

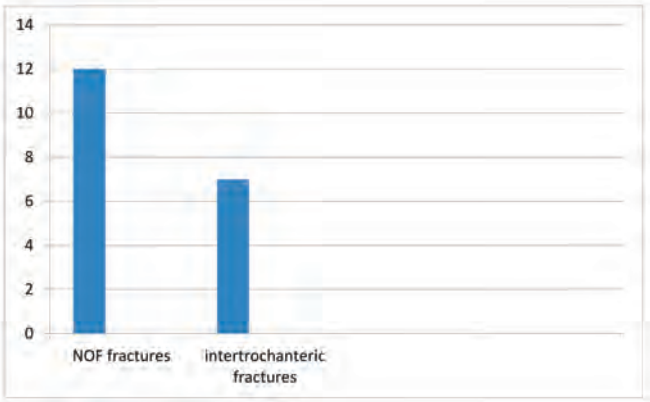

Fig. 1: Number of patients with intertrochanteric *vs* neck of femur (NOF) fractures, 2002–2003.

which three were transferred to an institution equipped with an image intensifier. Of these 19 patients, two did not fulfil the criteria of typical hip fracture patients. One was a 23-year old male who had sustained his injury in a motor vehicle accident and the other was a victim of a gunshot injury. As a result, further analyses included data from the records of 14 patients with typical hip fractures that were treated at the SABRH.

Of the analysed group, 52.6% were 80–89 years of age; there was one patient whose age was unknown. The majority of these patients sustained their injuries after falling (69%), while motor vehicle accident (5%) and blunt trauma (5%) were other mechanisms of injuries. The mechanisms of injury for 21% of the group were unknown.

Only 42% of patients presented to the SABRH on the day of injury, 32% within the first week and 11% within the 3rd week. The data show that 15% did not know how long they had sustained the injury prior to arrival at hospital.

Hypertension and diabetes mellitus were co-morbid conditions in 26% and 21% of these patients, respectively.

Only 57% were able to afford low molecular weight heparin; the other 43% were given unfractionated heparin.

Surgical fixation was carried out in six (43%) of these patients, five hemiarthroplasties and one screw fixation.

Only 36% of the patients were ambulant at discharge. The mean length of hospital stay was three weeks.

The total in-hospital mortality rate was 43% (six patients), postoperative in-hospital mortality rate was 33% (two patients); pulmonary embolism was the cause of death in both patients.

2006–2008

There were 101 patients who presented with hip fractures during this period; 57 were intertrochanteric while 44 were femoral neck fractures (Fig. 2). All patients with intertrochanteric fractures were transferred to an institution with an image intensifier, while those with neck of femur fractures were offered surgery at the SABRH.

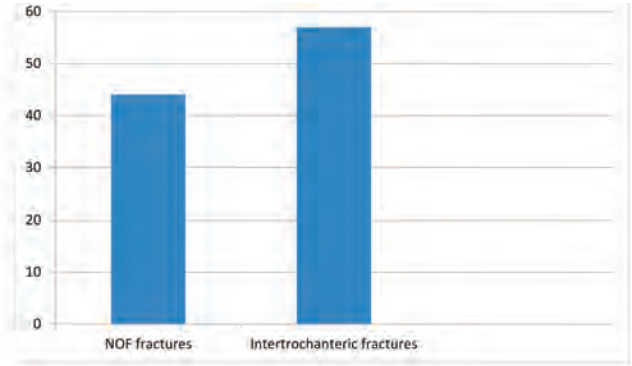

Fig. 2: Number of patients with intertrochanteric *vs* neck of femur (NOF) fractures, 2006–2008.

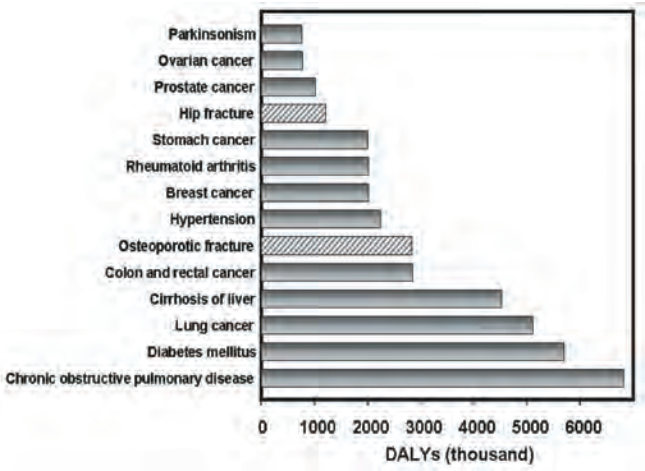

Fig. 3: Burden of diseases estimated as disability-adjusted life years (DALYs).

Source: WHO; 2007 (5)

Patients in the age group 80–89 years remained the dominant group (42%). Falls was the mechanism of injury in 85% of these patients while motor vehicle accident, blunt trauma and unknown aetiology each accounted for 5%.

Within 24 hours of sustaining their injuries, 55% of these patients presented to hospital, 33% presented within

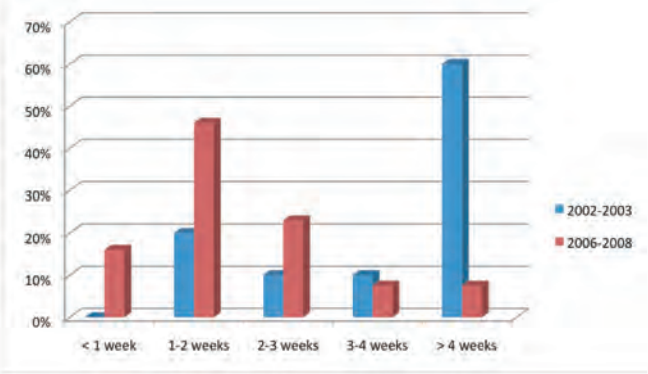

Fig. 4: Length of hospital stay.

two to seven days and 12% presented after one week. Low molecular weight heparin was used for thromboembolism prophylaxis in 92% of the patients; the others received unfractionated heparin. Of the patients who received definitive management at the SABRH, 35 were treated operatively and nine non-operatively. There were 33 hemiarthroplasties and two screw fixations performed. The in-hospital mortality rate was 4.5% with no postoperative deaths occurring in hospital, and 82.9% of the patients were ambulant at discharge. The mean length of hospital stay was one week.

DISCUSSION

Osteoporosis is a major public health concern and this disease causes more than 8.9 million fractures annually worldwide, of which more than 1.4 million occur in the Americas. Estimates of 30% to 40% life time risks have been estimated for the occurrence of wrist, hip or vertebral fracture in developed countries. The risk of this occurrence is close to that of coronary heart disease (5).

Osteoporotic fractures have been documented in the proximal humerus, distal radius, vertebral column and hips (6). The fractures rank high among complications that cause people to become bedridden. This, coupled with other complications, can impart high mortality rates in elderly people as was illustrated in the SABRH audit.

In the Americas and Europe, osteoporotic fractures account for a significant amount of disability-adjusted life years (DALYs). The DALYs attributed to osteoporotic fractures are comparable when related to other chronic illnesses *eg* hypertension, diabetes mellitus and rheumatoid arthritis (Fig. 3). Collectively, osteoporotic fractures account for approximately 1% of the DALYs attributable to non-communicable diseases (7).

In developing nations, health service data are required on length of hospital stay, morbidity, mortality and institutionalization associated with osteoporotic fractures, together with the associated costs, so that osteoporosis and management of its complications/problems can be placed in an adequate healthcare perspective.

The recorded incidence of hip fractures in the population studied was one in 19 473 for the 2002–2003 cohort of patients compared to one in 3663 for the 2006–2008 cohort of patients. This rise in the recorded incidence is a direct result of education of the population, who are now seeking medical attention. However, the actual incidence may be greater than the recorded incidence, as some patients were transferred directly to other regional hospitals from the peripheral hospitals.

Our management of hip fractures has been somewhat limited due to the lack of an image intensifier. As a result, patients with intertrochanteric fractures are routinely transferred to centres with such facilities. Analysis of the data collected from the cohort of patients studied in 2002 indicated that our outcomes were poor. Principal indicators of this were an in-hospital mortality rate of 43% and only 36% of patients were ambulant at discharge. With subsequent modification of methods, outcomes were better for the cohort of patients studied from 2006–2008; total in-hospital mortality rate decreased by 38.5%, mean hospital stay was decreased by two weeks (Fig. 4) and 46.9% more patients were now ambulant at discharge.

Jiang *et al* studied a cohort of 3981 patients with hip fracture in a large Canadian health region from 1994–2000 and they found a 6.3% in-hospital mortality rate (8). Jensen and Tundevold, in a similar study, found an in-hospital mortality rate of 8.6% (9). Our mortality rate during hospitalization was 43% in the 2002–2003 cohort of patients. Of this 43%, preoperative deaths accounted for 29% and postoperative deaths 14%. Pulmonary embolism was the cause of all postoperative deaths. Mortality rate during hospitalization decreased to 4.5% in the 2006–2008 cohort of patients, which is a reflection of the benefits of modifications made to management strategies, which placed emphasis on optimizing the patients for early surgical intervention, thromboembolism prophylaxis and also early postoperative mobilization. The fact that all in-hospital deaths occurred preoperatively emphasizes the importance of early surgical intervention in these patients. Barnes reviewed the ability of 70 inpatients at a geriatric rehabilitation centre to achieve pre-fracture ambulation status after hip fractures. He found that 40% returned to their pre-fracture ambulation status after rehabilitation (10). Miller conducted a similar study with 360 patients and found that 51% were able to achieve their pre-injury ambulatory status (11). Our analysis showed that in the first cohort of patients, 36% was ambulant at discharge; with modification of our management strategies, 82.9% of the second cohort was ambulant at discharge. Barnes followed the patients in his study for one year post fracture (10). We were unable to follow our patients for such an extended period of time, but we believe that a greater percentage would have achieved ambulatory status at one year.

In conclusion, early surgical fixation is necessary to allow rapid mobilization in these patients for whom the consequences of bed rest would otherwise be devastating.

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