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Epidemiology and Rehabilitation of Hip Fractures in the Geriatric Population.

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Abstract

Hip fractures are the leading cause of morbidity and mortality in the elderly population. The purpose of this study was to identify the risk factors along with effective rehabilitation measures for the hip fractures in elderly age group. Data was collected over a period of two years on 176 geriatric patients with hip fractures presenting to our institute. Demographic information, medical history, mobility and environmental factors were recorded along with the intervention and also the complications encountered. 59% were intertrochanteric fractures while the rest (41%) were intracapsular neck fractures. Majority of them were treated surgically and only 4% managed conservatively. Special effort was made to mobilize the patients as early as possible and prevent complications. The functional recovery of the patients after one-year post surgery was noted (70%) and conclusions made. Effective prevention of the risk factors along with vigorous and early rehabilitation helps in early recovery of hip fractures in elderly population.

Key words : **hip fractures, geriatrics, rehabilitation, mobility**

Introduction

In the geriatric population, fall is the leading cause of nonfatal injuries and hospital admissions[1]. Among the fall related fractures, hip fractures lead to the most severe health problems and reduced quality of life thus causing the greatest number of deaths. [2,3]. The medical cost of these injuries, in the elderly age group, is also very high. A hip fracture is generally a fracture of the proximal femur. Such injuries may be divided into three categories, according to the anatomical area in which they occur. Femoral neck and intertrochanteric fractures account for over 90% of hip fractures, occurring in approximately equal proportions and subtrochanteric fractures account for the remaining 5-10%. Given our aging population, the number of hip fractures is expected to increase dramatically in the next decade. While rehabilitation interventions to decrease the risks of falls and thus prevent hip fractures are of utmost importance [4], post fracture rehabilitation care is also crucial. These interventions should be initiated within the initial few postoperative days and continued until the individual has maximized functional skills within the community. A thorough understanding of the newer treatment settings, available resources and the appropriate medical and rehabilitation strategies is necessary to minimize post fracture complications. A combination of orthopaedic surgery and early postoperative physical therapy is usually the best approach. The overall goal in the treatment of the geriatric hip fractures is to return the patient to the premorbid level of function. [5-8].

This study was undertaken to understand and respond more effectively to the needs of the hip fracture patients. The specific aim was to find the risk factors in hip fractures and to determine the effectiveness of adequate rehabilitation on functional recovery of the patients.

Materials and Methods

A total of 198 patients admitted with recent hip fracture at our tertiary level health institute were evaluated in this retrospective study. The study period extended from 2002-2004. To be included in this study, patients had to be 60 years of age, or older, ambulatory and should have sustained a fracture of non pathological origin. A total of 22 patients were excluded because of pathological hip fractures. All the required demographic information was collected preoperatively. Information on functional status, living circumstances, and ambulatory status were reviewed and obtained from the patient or their relatives. General health status was defined by a number of preexisting significant comorbid condition including asthma, cardiovascular disease, angina, myocardial infarction, stroke, congestive heart failure, COPD, hypertension, diabetes mellitus, seizures or previous fractures. Assessment of basic activities of daily

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living was adapted from the method of Katz coworkers [9]. It was classified as independent or dependent on each of the four basic activities of daily living, bathing, eating, toiletry and dressing with response grading from ability to do it alone to being completely dependent.

To assess the role of severity of health problems at the time of admission, ASA classification was used [10]. All preoperative radiographs were examined for fracture type, displacement and comminution. The fractures were classified as either intertrochanteric, intracapsular or subtrochanteric. All patients were attempted to be treated surgically with open reduction and internal fixation as early as possible but night –time surgery was avoided. The patients with intertrochanteric fractures were treated with a dynamic hip screw and plate system. The patients with femoral neck fractures were treated with cancellous screw fixation, Austin Moore's, Thompson endoprosthesis or bipolar arthroplasty. Postoperative radiographs were reviewed to determine the treatment rendered and result obtained.

The standard post surgical rehabilitation consisted of chest physiotherapy and quadriceps exercises on the first day after surgery, progressing to daily active assisted exercises. Patients with stable fractures were out of bed on the second day after surgery and began ambulating daily with weight bearing as tolerated. Patients with unstable fractures were required to remain non weight bearing for six weeks. All the complications encountered during the patient's stay in the hospital were recorded. All patients were scheduled for follow up visits in the orthopaedic clinic at six weeks, three, six and 12 months after hospital discharge.

Results

This study of 176 patients enrolled during the two year period included 118 (67%) males and 58 (33%) females. The average age was 63 years for men and 65 yrs for women, with an overall average of 63.5 years. There was no major difference in the age between men and women. Interviews were conducted directly with the patient. As expected, most patients had a history of other medical conditions before hip fracture. The most prevalent were arthritis (63%), hypertension (60%), diabetes mellitus (32%), heart disease (30%) and cataract (30%). 27% patients reported previous fractures. Neurological conditions were common with 15 % of patients having a previous stroke and 8% having Parkinson's disease. Physical limitations as revealed by impaired mobility, were present in most patients. 54% patients described having difficulty in at least one of the common mobility tasks of daily living. Most of the falls occurred indoors, only 28% of the falls occurred outside. The most frequent sites indoors for the falls were the bedroom (20%), living room (17%) and kitchen (14%). Sixty percent of the falls occurred during daylight hours, but lighting was believed to be adequate at the time of the fall in 85% of the patients. In 40% of the falls the patient slipped or tripped. For 33% of the patients, an endogenous cause (weakness, dizziness) was responsible for the fall. Intertrochanteric fractures were seen in 104 patients (59%) and intracapsular femoral neck fractures in 72 patients (41%). The fracture configuration was not related to activity at the time of fall, or location of fall. Nearly all intertrochanteric fractures were treated by open reduction and internal fixation (ORIF) with dynamic hip screw and plate fixation and all but one intracapsular

Table-1: Gender And Age Distribution Of The Study Group

Age (years)	Male	Female	Total
60-70yrs	72	32	104
70-80yrs	34	20	54
80yrs & above	12	6	18
Total	118	58	176

Table-2: Relationship Of Fracture Pattern With Gender, Age And Treatment Options

	Intertrochanteric #	***Intracapsular #***	***Total***
Male	68	50	118
Female	36	22	58
Age (years)			
60-70	61	43	104
70-80	33	21	54
80<	10	8	18
Overall	104	72	176
Treatment regimen			
ORIF	98	18	116
Endo/THA	—	53	53
Conservative	6	1	7

Table-3: Incidence Of Postoperative Complications

Complications	*Number (%)*
Urinary Tract Infection	24 (14)
Chest Infection	17 (10)
Congestive Heart Failure	12 (7)
Deep Venous Thrombosis	8 (5)
Operative Wound Infection	8 (5)

fractures were operated upon. 7 patients (4%) were treated nonoperatively because of severe medical problems that precluded surgical intervention. 24 patients (14%) developed urinary tract infections during their hospital stay. Deep venous thrombosis was seen in 8 patients. Pneumonia and other chest related infections were noted in 17 (10%) patients and CHF in 12 patients. The mean hospital stay was 18 days with the median length of stay being 14.7 days. The duration of hospital stay was more in patients who had more comorbid conditions or those who developed complications post surgery.

Patients were mobilized as early as possible, with most of the fractures being mobilized on postoperative day one. No mortality was observed in the subject patients during their hospital stay. By the end of one year, nearly 70% had returned to their basic activities of daily living.

Discussion

Hip fractures are the leading cause of morbidity and mortality in the elderly population. Various studies have been conducted to evaluate the factors playing a role in the falls and subsequent fractures [11-13]. The current study was designed to identify the medical, social and environmental milieu surrounding the elderly patient with a fractured hip and also to evaluate the complications associated with an aim to prevent them in future. In our study, there was a high prevalence of associated medical conditions like cardiovascular, neurological conditions. They have been shown to be potential risk factors for falls and fracture of the hip in various studies [14]. These conditions have an affect on the general condition of the patient and hamper early surgical intervention. Patients with out any comorbid conditions were taken up for surgery earlier and also discharged earlier than other patients.

Most fractures are caused by stumbling and tripping which usually occurs indoors at a level ground. This was further reaffirmed in our study as already reported by a number of authors before[12-15]. Proper assessment of the subjects' environment at home should therefore be done. During rehabilitation, physical impairments should be addressed first. Patients should wear hip protectors, which help prevent hip injury caused by a direct fall from a standing position [16]. Periodic review of the patient's prescription and other medications is also imperative so that psychotropic drugs and sedatives may be avoided as much as possible [14]. A firm understanding of the individual's premorbid characteristics and habits is therefore vital. Special considerations are also necessary to address mobility deficits in the older adult with hip fracture, including alterations in vision, decreased peripheral sensations, age related imbalance, decreased strength and limited physical endurance. Recovery of motor and balance function tends to occur more slowly in the older adult, owing to premorbid limitations, decreased tolerance for therapy and joint or musculoskeletal pain. Lastly the concept of safety awareness, or an individual's understanding of his or her limitations, need to be further examined [17-18]. The current study advocates attention to well established fall-risk factors to obtain the greatest accuracy in predictive judgments and adoption of realistic expectations about our ability to predict this unfortunate event.

Although the primary goal of rehabilitation is clearly to restore premorbid function after hip fracture, methods to do so are less well established. This study focused on improving functional outcome of hip fracture patients through intensive rehabilitation efforts. Patient outcomes are determined primarily by the success of the orthopaedic repair, by patients preexisting cognitive impairments, or by the strength of family support systems [19]. An intense rehabilitation program is also essential to prevent further morbidity. All individuals with hip fractures should be mobilized out of bed as early as possible. For the majority of patients, this can begin within 24 hours of surgical intervention. We found in our study, beneficial effects of early mobilization with decreased postoperative complications.

Prevention of thromboembolic complications (deep venous thrombosis or pulmonary emboli) is critical after a hip fracture. An important component of this effort is early mobilization, which decreases venous stasis in the legs. In our study, 8 patients had deep venous thrombosis, in spite of prophylactic antithrombotic medication in high risk cases. The current trend is for patients to receive prophylactic medication based on a careful assessment of the patient's risk factors and the physician's preference.

In our study, the most common postoperative complication was urinary tract infection Change in routine, lack of exercise, poor hydration were the various compounding factors along with catheterization [20]. Constipation is also a frequent postoperative complication in the elderly. Opiod analgesics and calcium supplements are the usual causes for constipation after hip fractures.

Hence, adequate hydration, scheduled toileting facilitates return of normal bowel and bladder functions.

In our study, no objective test for evaluation of osteoporosis was used. In general, it has been estimated that 70% of hip fracture are due to osteoporosis [21]. Hence, as a matter of routine prophylaxis, all geriatric patients should have an intake of adequate amount of calcium supplements and vitamin D daily. Weight bearing exercises; such as walking further prevent bone loss.

A small number of our patients underwent an alternative conservative approach to surgical intervention. It consisted of a limited period of bed rest followed by gradual progression towards walker-assisted mobility. This was done in patients whose comorbid conditions precluded surgery. This is also an effective treatment approach followed by some [22,23], in which the patients with time, become pain free without operative intervention. In contrast to THR, prognosis following a hip fracture is guarded [22-24]. Miller reported 51% of survivors regained their prefracture ambulatory status within a year of fracture. In our study, the functional recovery rate was higher (70%) than the rest which may be explained by the fact that majority of our patients were in the 'younger' geriatric population of 60-70 year group.

Hip fractures in the elderly are a major public health concern, causing prolonged disability, morbidity and loss of function. The demand for rehabilitation services following a hip fracture is most likely to increase in the foreseeable future. A comprehensive rehabilitation program providing evidence-based intervention along with prevention of obvious risk factors of geriatric hip fractures is therefore essential.

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