FRACTURE PATTERNS IN THE ELDERLY – THE DAVANAGERE EXPERIENCE

Orthopaedics

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ABSTRACT

Objective – The main objective of this study was to bring out the patterns of geriatric fractures in a level 2 traumacentre with respect to age, sex, lateralization and type of fracture. This would predicting the fracture in geriatric patients who are particularly at risk (osteoporotic and osteopaenic) patients and would help us in reducing the fractures by preventive methods including the strengthening of bones and preventing falls in the elderly by appropriate means.

Methods – We retrospectively analyzed data from a level 2 traumacentre in a distict head quarters government hospital catering to a population of 1.9 million in Davanagere, a city in Karnataka.
The inclusion criteria were all patients above 60 years who had a fracture and was operated in the same hospital. The data was collected over a 1 year period. The collected data was analysed and arbitrary figures were arrived at from which the patterns as mentioned above could be calculated.

Results –We did find specific patterns and predilections with regards to the side, age, sex and type of fracture in the data that we analyzed.

Conclusion – This is a pioneering one of its kind study in the whole country. There is only data available internationally in this regard and this throws some light on the patterns unique for our country. There is an increasing emphasis on the improvement of qualityof life in the geriatric population and this study will help us prevent geriatric fractures by treating osteoporosis and by taking measures to prevent falls in the elderly which is an established standard practice in the western health care systems. This study also has the potential to be expanded with a bigger sample size and correlating fracture patterns with the degree of osteoporosis (T-score).
- There is no similar study for the Indian population
- Western data cannot be blindly appplied to Indian patients as there are differences with respect to social structuring and the body phenotype
- This study brings out the relevant statistics and pattern for the Indian population
- It can be expanded further to include other parameters

KEYWORDS

INTRODUCTION –

Fractures in the elderly population constitute a majority of fractures that GPs and Orthopaedic surgeons deal with on a daily basis. *Recent studies show that the number of trauma admissions related to road accidents has fallen, while age associated injuries have increased, and that hip fractures in the elderly are very often the result of a fall at home[1].The lack of data on the occurrence of fractures means that forecasts as well as medical and health economics planning are based on shaky foundations[1]* It is essential to analyze and study these fractures as a separate entity because of the following reasons : (1) the management and rehabilitation protocols for these fractures are different from the same fractures in the non-geriatric population, (2) most of these fractures are associated with osteoporosis (the importance of this association is that the risk of fractures in the elderly can be predicted with the degrees of osteoporosis which can be numerically ascertained by DEXA scanning and T-score values).

The latest data indicating a decline in age-standardised hip fracture rates cannot be extrapolated to other types of fractures or to fracture rates overall. On the contrary – fracture rates as a whole appear to be increasing. And even if the percentage rates of hip fractures remain stable, the actual number of cases is set to almost double by 2050 in light of the growing, ageingpopulation[1]. The identification of target groups in the elderly,vulnerable for fractures allows us to institute specific therapies to restore bone strength and thus reduce the risk of fractures. *Ideally, more data are needed to support the classification of current trends in fracture severity, as well as for development of treatment protocols for the most common types of fracture, and of cost-benefit analyses of pharmacological treatments and other interventions for different fracture types[1].Hip fractures below 50 years of age are rare and constitute only about 2 % of all hip fractures in Sweden[2].*

Most common fractures among patients presenting to the emergency department aftera a fall in the following order – Spine ; Hip ; Forearm ; Leg ; Ankle ; Pelvis ; Humerus ; Hand[4].

In our study, which is a retrospective analysis of fractures of the elderly from our hospital, we have aimed at zeroing in on the most common fracture along with the sex predilection. We have compared both these parameters to data from across the world and our inference from the representative population can be extrapolated to a bigger population. Identifying the most common fracture in the elderly population would help us caution vulnerable patients about it and devise adequate strategies to prevent fracture specific falls.*The expected number of hip fractures in the beginning of the next century can be calculated*

on the based on the expected increase of the number of elderly in the population and is also based on the increased risk of hip fractures i.e. incidence increase[1]. Fractures linked to osteoporosis, the so called fragility fractures, usually include the hip fractures, vertebral fractures, fractures of the distal radius, fractures of the proximal humerus, ankle fractures and pelvic fractures[1].

The fracture types changed somewhat with a dominance of cervical fracture in younger ages and an increasing proportion of trochanteric fractures with increasing age. The increasingnumber of trochanteric fractures with age is in accordance with data indicating more osteoporosis in trochanteric fractures whereas there has been difficulty to show osteoporosis in femoral neck fractures[1].

MATERIALS AND METHODS –

We analyzed a cohort of 93 patients, who presented with fractures to Chigateri General Hospital, Davanagere which is a 550 bedded secondary health care facility and a level 2 trauma centre in the district of Davanagere, the state of Karnataka, India. All patients above 60 years of age, with any kind of fracture were included in the study. Due to unavailability of data we only enrolled patients for whom some kind of surgery was planned and done. We obtained information relating to the age, in-patient number, side and limb involved and the details of the fracture. After compiling the data we did an analysis and listed the fractures in order of their incidence. We also arrived at a male : female ratio. As the cohort chosen is representative of the general population, the inference can be extrapolated to the general population who are 60 or more years of age.

RESULTS -

TYPE	NUMBER
IT	33
NOF	14
DR	5
LG	13
CL	1
CA	2
SD	1
GA	1
PA	2
NOH	2
SC	1
OLEC	2
BM	3
TM	2
FE	2
HU	1
MM	1
RH	1
FA	1
ST	5
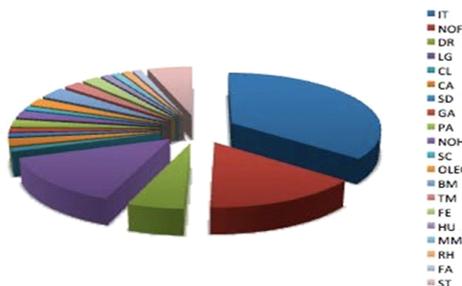
Key -
IT –   Inter-trochanteric fracture of the femur NOF – Neck of femur fractureDR – Distal radius fracture

LG – Tibial / Fibular / both Tibial and Fibular CLA – Clavicle fracture CA – Calcaneal fracture

SD – Shoulder dislocation associated with a fracture GA – Galleazi fracture

PA – Patellar fracture
NOH – Neck of humerus fracture

SC – Supra-condylar fracture of the elbow OLEC – Olecranon fracture BM – Bi-malleolar fracture TM – Tri –malleolar fracture FE – Femoral shaft fracture HU – Humeral shaft fracture

MM – Medial malleolar fracture RH – Radial head fracture FA – Forearm fracture

Type of fracture – Percentage attributed to falls by older women
Wrist - 96
Proximal humerus – 95 Hip – 92
Ankle – 88
Pelvis – 80
Femur – 77
Tibia/ Fibula -65
Face – 59
Vertebral <25

In our analysis we found that inter-trochanteric fractures of the femur (fractures of the hip) were the commonest (35 %of all fractures). The second most common fracture was found to be the neck of femur fracture (15 % of all fractures).

Fractures of the leg (both bones and only tibia / fibula), were found to be the third most common type of fractures (14% of all fractures). All other fractures constituted about 36 % of the total number of fractures. *The ratio of female to male incidence rates is higher than 1.0 in whites, while in Blacks and Asians it has often been the reverse with higher rates among men. In recent years in Hong Kong incidence rates in females have increased more rapidly than incidence rates in males, so that now the incidence rates in females are higher than those in males[3].*

On analysis of the sex distribution of the fractures, it was found that the male to female ratio (M:F) is 1.16:1. On analyzing which sided fractures were common across all the age groups, the right sided fractures were more common the ration of (R:L) fractures being 1.32:1. The male – female ratios assume importance in ascertaining the risk factors for fractures in the elderly, one of the major risk factors being osteoporosis, which is a condition seen more prevalently in post-menopausal women due to oestrogen deficiency. The results of our study do not support the theory that elderly fractures are more common in women having osteoporosis due to oestrogen deficiency. Ascertaining the side predilection of fractures in the elderly assumes importance because of it's interpretation in the context of the worldwide ratio of right- handers to left handers (10 : 1) (Ref. The Journal of Royal Society Interface). This would shed some light on the mechanism of injury in fractures in the elderly particularly when it is related to a fall (to establish a fall pattern and devise strategies to prevent it). From our study it is found that the side predilection (R: L) is 1.32 : 1.

CONCLUSION –

This study gives us a fairly reliable estimate into the most common type of fractures in the elderly.*In Sweden now, 18000 hip fractures occur each year, of which about half are femoral neck fractures and the other half intertrochanteric fractures. A smaller amount of fractures are baso-cervical and sub- trochanteric[1].*There have been a lot of studies on the treatment of specific type of geriatric fractures and the association of osteoporosis as a risk factor for these fractures but no reliable studies have been done on the Indian population to ascertain the most common fracture, along with the sex and side predilection. This study was done by analyzing patient data from a single centre over a 1 year period. Risk factors and hence the causes of fractures in the elderly are very area specific. Though this data can be extrapolated to the general population anywhere, more area specific studies would be needed to arrive at a more accurate prediction. Age – specific fracture incidence estimation would also be more helpful in this regard. The objective of this study is to bring out the pattern of geriatric fractures in a level 2 traumacentre, but the study here includes only the operated cases. The cases treated conservatively have not been included and no investigations were done to identify osteoporotic patients. So the objective to assess the fracture pattern has not been met with in its entire sense in this study.The further scope of this study can be in terms of converting it into a multi-centre long term study including centres from geographically different areas, to include DEXA scores, find out the relation between DEXA scores and the most common type of fracture and to find out the most common mode of injury / fall for the most common type of fracture. Patients with geriatric fractures from

this study can also be followed up and the outcomes of the surgical treatment instituted can be evaluated versus a cohort ofpatients with similar fractures treated by non- surgical methods.

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