Original article

Prospective study of ankle and foot fractures in elderly women

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Abstract

The epidemiology of ankle fractures in old people is changing as time passes on. The incidence of ankle fractures increases with advancing age. The study conducted was among a rural population which comprised of 68 women (32 women with ankle fractures & 36 women with foot fractures). Patients studied were in the age group more than 50 years. The study highlights the etiological & risk factors for fractures of ankle & foot. The commonest ankle fracture was the lateral malleolar fracture & the commonest foot fracture was the 5th Metatarsal fracture. Diabetes is a risk factor which increases the occurrence of ankle and foot injuries.

Key words: Elderly women, Osteoporosis, Risk factors, Fracture lateral malleolus, Fracture 5th metatarsal.

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Ankle and foot fractures are common, only next to spinal injuries, in the elderly. Fractures of ankle and foot have significant negative effects on the quality of life of patients, leading to functional disability. Our study was designed to find out the incidence of foot and ankle fractures among rural populations and their risk factors.

To determine risk factors for ankle and foot fractures, a survey was conducted in 68 women over the age of 50 years. The time period of the survey was 2 years 6 months. The baseline questionnaire used, covered all the life style factors (physical activity, diet and addictions) which might impact these injuries. The functional impairment and disability were also noted. The treatment of co-morbidities was also taken care of.

These fractures both have good prognoses, though they do have a substantial effect on routine work and lifestyle.

The foot and ankle fractures in elderly people are commonly associated with female gender, obesity, diabetes and poor muscular control. Care of health in elderly people is missing compared to children or other members in families.

Material and methods

A prospective study was conducted in the Department of Orthopedics. A total of 68 female patients with ankle and foot fractures were examined as out-patients during the two year six months period i.e. March 2007 to September 2009.

Detailed history including complaints, past history, co-morbidities and the personal history related to addictions like smoking, chewing tobacco, gutka, alcohol intake and use of estrogen replacement therapy and benzodiazepines for various indications was taken. History of the fracture and the type of fall has been noted in all cases. X rays and bone mineral density (BMD) tests were done.
Examination included: general, physical status, gait, vital data and detailed examination of ankle and foot deformity, functional impairment and disabilities. The involved women were followed up for 2 years 6 months. The fractures were classified by Orthopedics Trauma Association guidelines.

The patients examined were of age more than 50 years, the average age being 64 years, for the 68 cases in our study. Of these 68 patients, 32 patients had Ankle injuries, & 36 patients had foot injuries.

The pre-fracture functional status / physical activity level, was studied in our patients taking the below questionnaire into consideration –

1. Walking for 200 meters
   yes no
2. Ascending 10 steps without stopping
   yes no
3. Ascending 10 steps
   yes no
4. Strenuous work at home
   yes no
5. Routine work at home
   yes no
6. Cognitive function
   yes no
7. Height and weight

8. BMI was calculated as Weight/(Height)^2 in (kg/m^2)
9. B.M.D

The findings were analysed, to obtain patterns and co-relations.

Study data also includes:
1. Number of fractures in the ankle i.e lateral malleolus, medial malleolus, posterior malleolus and ankle mortise.
2. The foot fractures involving tarsals, metatarsals, phalanges.

The fractures were classified in detail on the basis of their location and simple or open fractures / commination.

Exclusion criteria:- patients less than 50 yrs, patients with open fractures, patients involved in poly trauma, patients with severe cardiovascular and neurological disorders, patients with pathological fractures, patients who were chronic alcoholics.

Results

During the study period of 2 years 6 months, 68 patients were involved with ankle and foot fractures out of a total 5368 presenting to OP, overall incidence being 68/5368 i.e, 1.2%.

Fig 1: Incidence of foot and ankle fractures in elderly

On an average:
- Number of falls in a year prior to the fracture=2
- Number of days of physical activity done in a week= 3 to 4 days in a week. Weight gain or weight loss--weight gain is more than loss, out of 68 patients 44 had weight gain and the remaining 24 had weight loss. Involvement of fractures in other family members—30%. Associated diabetes—about 32% cases. H/O hypo/hyperthyroidism --- hypothyroidism is 40%.

Poor eye sight – about 50%
Ankle and foot fractures in elderly women

The ankle fracture incidence increased with high Body Mass Index (BMI), recurrent falls, increased age, decreased Bone Mineral Density (BMD) and the use of benzodiazepines.

The incidence of foot and ankle fracture is about 4.5% when compared to all fractures. The most common ankle fracture is an isolated lateral malleolus with association of sprain lateral ligament of the ankle; and the most common foot fracture is the 5th metatarsal.

Women who sustained ankle fractures were slightly younger at the time of study and they had a higher BMI, the younger age incidence might be accounted for by the relative over-activity of younger persons. BMD in the study group was found to be consistently low. The BMD was taken from distal part of the radius and calcaneal bone.

Discussion

The results of the study indicates that the risk factors for foot and ankle fractures differ. Foot fractures are typically more osteoporotic. The study conducted by Kaye is in concurrence with this. Ankle fracture occurring in relatively younger and more active women with a higher BMI as per the study of Spaine et al is in concurrence with our findings.

The rate of fracture increases as BMD decreases and BMI increases. Obese patients are more likely than nonobese individuals to sustain an ankle fracture, particularly a severe ankle fracture as also found in study by Hasselman et al, which found that in general the BMD can predict the occurrence of fracture, the site of fracture variously being the hip, spine, radius, ankle and calcaneum. In addition women with foot fracture are mostly from the post-menopausal age. Studies by Kaye et al and by Hasselman et al are in concurrence with this.

History of medication, poor diet, poor eyesight and poor cognitive function - all increase the risk of osteoporotic fracture.

This study suggests that ankle fractures are independent of BMD but foot fractures are definitely associated with decreased BMD: in concordance with Hasselman et al.

History of twisting and rotational injuries is common in ankle fractures. Falls in the bathroom and in the fields are common.

Our study suggests that fracture of the 5th metatarsal is common in the elderly individual with osteoporosis, as also found in studies by Jones et al, Delee et al and Lawrence et al.

Our study also suggests that, isolated lower end of fibular fracture i.e. lateral malleolus, is common in the obese.

The twisting/rotational injury at the ankle is an important mechanism to develop fracture of the lateral malleolus.

Diabetes Mellitus is associated with various skeletal problems and also with fractures of ankle and foot. Study by Ann V et al and Heath et al also reported the similar results.

This study suggests that diabetes is a risk factor for various osteoporotic changes, which increase the risk of ankle and foot injury. In our study of 68 patients, 22 patients i.e., 32.35% were found to be diabetic, who sustained fracture with minimal trauma.

A great majority of 5th metatarsal & lateral malleolar fractures were found in elderly women; fracture is probably because of loss of control of foot muscles and the foot becoming flat, supinated & everted with the weight falling directly on the lateral aspect of the foot & ankle.

Conclusion

Fractures are common in elderly women, the incidence increases as age advances. Most of these fractures are associated with minimal trauma.

The foot fractures are osteoporotic fractures with a low velocity injury and in many of the cases are stress fractures. Other factors like poor diet, vitamin D deficiency, metabolic disorders and poor eyesight are also influencing the causation. Fracture 5th metatarsal is common, in which fracture at the base is the commonest.

Ankle fractures occur in relatively young age group with high BMI and over-activity, in which the com-
monest fracture is found to be the lateral malleolar fracture.

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Conflict of interest: None

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