

Proportion of Fractures in a Tertiary Care Hospital-A Cross Sectional Study

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ABSTRACT

Introduction: Musculoskeletal injuries are a major public health problem globally. A bone fracture is a medical condition where the continuity of the bone is broken. Study aimed to estimate proportion and demographic distribution of fractured cases with objectives to estimate proportion of fracture with age and sex and to find distribution of fracture of bones with age and sex.

Material and methods: It was a cross sectional prospective study carried out between January 2019 to December 2019 in the Rohilkhand Medical College and Hospital, Bareilly (U.P.), India. All patients with fractures during study period were included in the study. The biodata of patients were obtained and examination and investigation of injured part of body were done. Data analysis was done by SPSS version 21 and result presented in frequency and cross tables.

Results: We found maximum fractured cases (27.90%) and (64.19%) in 31-40 yrs age group and in males respectively. Maximum cases (37.42%) were of the fracture of femur and minimum cases (00.70%) were of the fracture of Maxilla, Odontoid and ribs.

Cocnclusion: Amongst females maxilla, dislocation, communicated radius, fibula were more yet number more not substantial so a remark cannot be drawn.

Keywords: Fracture, Femur, Maxilla

INTREODUCTION

Musculoskeletal injuries being a major public health problem globally pose a huge burden of disability suffering and mortality.¹ A bone fracture is a medical condition where the continuity of the bone is broken. Data on fractures related to age are projected to increase nationally from 2.1 million (2005) to over 3 million (2025), solely on the basis of growth in the elderly population most at risk.² A reduction in the use of oestrogen therapy following publication of the Women's Health Initiative Trial in 2002 and effects of ongoing epidemic of obesity in the country³ has also contributed to risk of fracture. Hip fractures are a major threat to the survival of affected individuals associated with a high mortality rate (14-36%) and morbidity.^{4,5} In road traffic accidents, lower limb bones are the most commonly reported fractures.⁶ Osteoporosis and trauma due to fall are an important public health and financial burden.⁷

There is paucity of data in the literature on demographic distribution of site of fracture in this region; hence this study has been planned.

Study aimed to estimate proportion and demographic distribution of fractured cases with objectives to estimate proportion of fracture with age and sex and to find distribution

of fracture of bones with age and sex.

MATERIAL AND METHODS

It was a cross sectional prospective study based on hospital records of the patients admitted between January 2019 to December 2019 in the Rohilkhand Medical College and Hospital, Bareilly. Ethical approval for study taken from Institutional Ethical Committee.

All patients admitted with diagnosed fractures during study period were included in the study. The data required for demographic age and sex of patients were obtained from the case file after reviewing. We extract data on distribution of fracture of bone from case file and find out proportion of fractures of various bones and their relationship with age and sex. Data recorded in Microsoft excel spread sheet 2016 and data analysis done by Statistical Package for Social science (SPSS) version 23.0 and result presented in frequency and cross tables. Examination and investigation of injured part of body were done.

RESULTS

Table no.1 shows maximum fractured cases 398 (27.90%) were in 31-40 yrs. age group and minimum cases 13 (00.90%) were in 81-90 yrs age group. Maximum fractured cases 926 (64.29%) were in males while 511 (35.80%) were females.

Table No II shows maximum fractured cases 534(37.42%) were of fracture femur and minimum cases were 01 (00.70%) of maxilla, odontoid, tibia fibula with femur in 0-10 yrs, 31-40 yrs and 21-30 yrs age group simultaneously.

Table No. III shows maximum fractured cases 534 (37.42%) of femur out of which 321 (60.11%) were males and 213 (39.89%) were females and minimum cases were of 01 (00.70%) of maxilla, odontoid, tibia fibula with femur in female, male and male simultaneously.

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Age group	No of cases	Percentage (%)
0-10 yrs	43	3.00
11-20 yrs	135	9.50
21-30 yrs	271	19.00
31-40 yrs	398	27.90
41-50 yrs	301	21.10
51-60 yrs	174	12.20
61-70 yrs	64	4.50
71-80 yrs	28	2.00
81-90 yrs	13	00.90
Total cases	1427	100.00
Sex distribution of fractured case		
Male	926	64.20
Female	511	35.80
Total	1427	100.00

Table-I: Demographic distribution of fractured cases

DISCUSSION

Distribution of age of fractured cases:

We found maximum fractured cases 398(27.90%) in 31-40 yrs age group followed by 301 (21.10%) in 41-50 yrs age group, 271 (19.00%) in 21-30 yrs age group, 174(12.20%) in 51-60 yrs age group, 135(9.50%) in 11-20 yrs age group, 64(4.50%) in 61-70 yrs age group, 43 (3.00%) in 0-10 yrs, 28(2.00%) in 71-80 yrs age group and 13(00.90%) in 81-90 yrs age group and maximum fractured cases are in males 252(27.51%) and in females 146(28.57%) and minimum in males 5(00.55%) and in females 8(01.57%)while in contrast Donalson LJ et al⁹ found early peak in males at 15-24 yrs age group and second peak in males 75-84 yrs age group and in females 45-54 yrs age group.⁹ this variation may be due to less cases in older age group in our study.

Distribution of sex with fractured cases

In our study we found fractures among males 916(64.20%) and females 511 (35.80%). Similar findings were reported by Ettinger B et al¹⁰ of higher prevalence among males (55.89%) than in females (44.11%) Similar finding of higher incidence of fractures among males (73.65%) than in females (26.35%) was observed by Babalola OM et al.¹¹ We also found higher incidence of fractures in females in early age group than incidence of fractures among males are higher than females. Similar finding was observed by Liam J ET al.⁹ In contrast Amin S et al¹² found incidence among males in2009-11-40.10% and in females 59.90% and in year 1981-91 in males 38.05% and in females 61.95%

Distribution of fracture of bones with age and sex

We found 534 (37.42%) cases of fracture femur, out of which in males it was 60.11% as compared to females 39.89%, maximum cases 28.65% were in 31-40 yrs age group and minimum cases 02.06% were in 0-10 age group similar finding was observed by Babalola OM et al¹¹ maximum fractures 24.40%.

We found fractures of hand and fingers 348(24.39%), similar finding (20.10%) was observed by Amin S et al.¹² In contrast higher incidence (34.73%), (42.1%) was reported by

Type of fracture	0-10 yrs	11-20 yrs	21-30 yrs	31-40 yrs	41-50 yrs	51-60 yrs	61-70 yrs	71-80 yrs	81-90 yrs	Total
Acetabulum	00(00.00) (00.00)	02(01.48) (25.00)	01(00.37) (12.50)	01(00.25) (12.50)	02(00.66) (25.00)	01(00.57) (12.50)	01(01.56) (12.50)	00(00.00) (00.00)	00(00.00) (00.00)	08(00.56) (100.00)
Clavicle	00(00.00) (00.00)	04(02.96) (10.00)	16(05.90) (40.00)	13(03.27) (32.50)	06(01.99) (15.00)	01(00.57) (02.50)	00(00.00) (00.00)	00(00.00) (00.00)	00(00.00) (00.00)	40(02.80) (100.00)
Tibia-Fibula	10(02.33) (02.94)	23(17.04) (07.32)	57(21.03) (18.15)	100(25.13) (31.85)	82(27.24) (26.11)	36(20.69) (11.46)	05(07.81) (01.59)	01(03.57) (00.320)	00(00.00) (00.00)	314(22.00) (100.00)
Maxilla	01(02.33) (100.00)	00(00.00) (00.00)	00(00.00) (00.00)	00(00.00) (00.00)	00(00.00) (00.00)	00(00.00) (00.00)	00(00.00) (00.00)	00(00.00) (00.00)	00(00.00) (00.00)	01(00.07) (100.00)
Odontoid	00(00.00) (00.00)	00(00.00) (00.00)	00(00.00) (00.00)	01(00.250) (100.00)	00(00.00) (00.00)	00(00.00) (00.00)	00(00.00) (00.00)	00(00.00) (00.00)	00(00.00) (00.00)	01(00.07) (100.00)
Scaphoid	00(00.00) (00.00)	00(00.00) (00.00)	02(00.07) (66.67)	00(00.00) (00.00)	00(00.00) (00.00)	00(00.00) (00.00)	01(01.56) (33.33)	00(00.000) (00.00)	00(00.00) (00.00)	03(00.21) (100.00)
Ankle	00(00.00) (00.00)	02(01.48) (15.38)	07(02.58) (53.85)	01(00.25) (07.69)	00(00.00) (00.00)	01(00.57) (07.69)	02(03.13) (15.38)	00(00.00) (00.00)	00(00.00) (00.00)	13(00.91) (100.00)
Calcaneus	01(02.33) (14.29)	00(00.00) (00.00)	02(00.74) (28.57)	04(01.01) (57.14)	00(00.00) (00.00)	00(00.00) (00.00)	00(00.00) (00.00)	00(00.00) (00.00)	00(00.00) (00.00)	07(00.49) (100.00)
Radius	05(11.62) (08.200)	10(07.41) (16.39)	16(05.900) (26.23)	15(03.77) (24.59)	05(01.66) (08.20)	08(04.60) (13.11)	01(01.56) (01.64)	01(03.57) (01.64)	00(00.00) (00.00)	61(04.27) (100.000)
Dislocation	01(02.33) (01.89)	07(05.19) (13.21)	10(03.69) (18.87)	18(04.23) (33.96)	07(02.33) (13.21)	07(04.02) (13.21)	02(03.13) (03.77)	01(03.57) (01.89)	00(00.00) (00.00)	53(03.71) (100.00)

Table-II: Distribution of fracture of bone with age group

Type of fracture	0-10 yrs	11-20 yrs	21-30 yrs	31-40 yrs	41-50 yrs	51-60 yrs	61-70 yrs	71-80 yrs	81-90 yrs	Total
Dislocation communicated radius	00(00.00) (00.00)	03(02.22) (100.00)	00(00.00) (00.00)	00(00.00) (00.00)	00(00.00) (00.00)	00(00.00) (00.00)	00(00.00) (00.00)	00(00.00) (00.00)	00(00.00) (00.00)	03(00.21) (100.00)
Femur	11(25.58) (02.06)	50(37.04) (09.36)	79(29.15) (14.79)	153(38.44) (28.65)	117(38.87) (21.91)	66(37.39) (12.55)	25(39.06) (04.68)	21(75.00) (03.93)	12(92.31) (02.25)	534(37.42) (100.00)
Fibula	00(00.00) (00.00)	00(00.00) (00.00)	03(01.11) (60.00)	01(00.25) (20.00)	00(00.00) (00.00)	01(00.57) (20.00)	00(00.00) (00.00)	00(00.00) (00.00)	00(00.00) (00.00)	05(00.35) (100.00)
Fore arm	05(11.63) (04.27)	09(06.67) (07.69)	32(11.81) (27.35)	27(06.78) (23.08)	26(08.64) (22.22)	12(06.90) (10.26)	04(06.25) (03.42)	02(7.14) (01.71)	00(00.00) (00.00)	117(08.20) (100.00)
Metacarpal	01(02.33) (05.26)	03(02.22) (15.79)	05(01.85) (26.32)	03(00.75) (15.79)	03(01.00) (15.79)	03(01.72) (15.79)	01(01.56) (05.26)	00(00.00) (00.00)	00(00.00) (00.00)	19901.33 (100.00)
Olecranon	00(00.00) (00.00)	00900.000 (00.00)	02(00.74) (16.67)	04(01.01) (33.33)	03(01.00) (25.00)	03(01.72) (25.00)	00(00.00) (00.00)	00(00.00) (00.00)	00(00.00) (00.00)	12(00.84) (100.00)
Patella	00(00.00) (00.00)	01(00.74) (04.48)	08(02.95) (34.78)	05(01.26) (21.74)	05(01.66) (100.00)	02(01.15) (08.69)	02(03.70) (08.69)	00(00.00) (00.00)	00(00.00) (00.00)	23(01.61) (100.00)
Ribs	00(00.00) (00.00)	00(00.00) (00.00)	00(00.00) (00.00)	00(00.00) (00.00)	01(00.33) (100.00)	00(00.00) (00.00)	00(00.00) (00.00)	00(00.00) (00.00)	00(00.00) (00.00)	01(00.07) (100.00)
Shaft humerus	08(18.60) (5.52)	10(07.41) (06.90)	22(08.12) (15.17)	40(10.05) (27.59)	37(12.29) (25.52)	20(11.49) (13.79)	07(10.94) (04.83)	01(03.57) (00.69)	00(00.00) (00.00)	145(10.16) (100.00)
Vertebra	00(00.00) (00.00)	07(05.18) (12.50)	07(02.58) (12.50)	09(02.26) (16.07)	07(02.33) (12.50)	12(06.90) (21.43)	12(18.75) (21.43)	01(03.57) (01.78)	01(07.69) (01.78)	56(03.92) (100.00)
Ulna	00(00.00) (00.00)	02(01.48) (33.33)	00(00.00) (00.00)	03(00.75) (50.00)	00(00.00) (00.00)	01(00.57) (16.67)	00(00.00) (00.00)	00(00.00) (00.00)	00900.00 (00.00)	06(00.42) (100.00)
Lower leg with femur	00(00.00) (00.00)	009(0.00) (00.00)	01(00.37) (100.00)	00(00.00) (00.00)	00(00.00) (00.00)	00(00.00) (00.00)	00(00.00) (00.00)	00(00.00) (00.00)	00(00.00) (00.00)	01(00.07) (100.00)
Metatarsal	00(00.00) (00.00)	02(01.48) (33.33)	02(00.74) (33.33)	01(00.25) (16.67)	00(00.00) (00.00)	00(00.00) (00.00)	01(01.56) (16.67)	00900.00 (00.00)	00(00.00) (00.00)	06(00.42) (100.00)
Total	43(100.00) (03.00)	135(100.00) (09.50)	271(100.00) (19.00)	398(100.00) (27.89)	301(100.00) (21.10)	174(100.00) (12.20)	64(100.00) (04.50)	28(100.00) (02.00)	13(100.00) (00.90)	14279100.00 (100.00)
Chi Square-310.228 P-value-00.000										

Table-II: Distribution of fracture of bone with age group

Type of fracture	Male	Female	Total
Acetabulum	07(00.76) (87.50)	01(00.20) (12.50)	08(00.56) (100.00)
Clavicle	33(03.60) (82.50)	07(01.37) (17.50)	40(02.80) (100.00)
Tibia-Fibula	217 (23.69) (69.33)	96(18.79) (30.67)	313(21.93) (100.00)
Maxilla	00(00.00) (00.00)	01(00.20) (100.00)	01(00.07) (100.00)
Odontoid	01(00.11) (100.00)	00(00.00) (00.00)	01(00.07) (100.00)
Scaphoid	02(00.22) (66.67)	01(00.20) (33.33)	03(00.21) (9100.00)
Ankle	09(00.98) (69.23)	04(00.78) (30.77)	13(00.91) (100.00)
Calcaneus	06(00.65) (85.71)	01(00.20) (14.29)	07(00.49) (100.00)
Radius	42(04.59) (68.85)	19(03.72) (31.15)	61(04.27) (100.00)
Dislocation	39(04.26) 73.58)	14(02.74) (26.42)	53(03.71) (100.00)
Dislocation com- municated radius	00(00.00) (00.00)	03(00.59) (100.00)	03(00.21) (100.00)
Femur	321(35.04) (60.11)	213(41.68) (39.89)	534(37.42) (100.00)
Fibula	02(00.22) (40.00)	03(00.59) (60.00)	05(00.35) (100.00)
Fore arm	74(08.08) (63.25)	43(08.41) (36.75)	117(08.20) (100.00)
Metacarpal	16(01.75) (84.21)	03(00.59) (15.79)	19(01.33) (100.00)
Olecranon	10(01.09) (83.33)	02(00.39) (16.67)	12(00.84) (100.00)
Patella	16(01.75) (69.57)	07(01.37) (30.43)	23(01.61) (100.00)
Ribs	01(00.11) (100.00)	00(00.00) (00.00)	01(00.07) (100.00)
Shaft hummerus	84(09.17) (57.93)	61(11.94) (42.07)	145(10.16) (100.00)
Vertebra	27(02.95) (48.21)	29(05.68) (51.79)	56(03.92) (100.00)
Ulna	03(00.33) 50.00)	03(00.59) (50.00)	06(00.42) (100.00)
Metatarsal	06(00.66) (100.00)	00(00.00) (00.00)	06(00.42) (100.000)
Total	916(100.00) (64.19)	511 (100.00) (35.81)	1427(100.00) (100.00))
Chi Square-50.135, P-value-.001			
Table-III: Distribution of fracture of bone with sex			

Babalola OM et al¹¹ and Scholes S et al¹³ respectively. Fracture of tibia and fibula 314 (22.00%) was observed in our study and maximum fracture (31.85%) in age group of 31-40 yrs and in males (69.33%).this is mainly due to active movement during this age group and due to long bones. Same finding was reported by Babalola OM et al¹¹ 25 % cases of fracture of Tibia. In contrast Scholes S et al.¹³ Found 10.25% fracture of Tibia- Fibula, but similar finding of more cases in males as compared to females. We found fracture humerus (10.16%), out of which 57.93%

were males and maximum cases (27.59%) were in 31-40 yrs age group while Babalola OM et al¹¹ found 15.50% cases. in contrast Scholes S et al¹³ and observed 3.85% and found more cases of females as compared to males.

We found fracture vertebra (03.92%), out of which 51.79% was amongst females and maximum cases (21.43%) was in 51-60 and 61-70 yrs age group. In contrast Scholes et al¹³ observed 1.80% and similarly more cases in females.

We found 40 (02.80%) cases of fracture of clavicle out of which 83.50% were males and 17.50% were females and maximum cases (40.00%) were in 21-30 yrs age group. similar finding of 3.2% cases was reported by Babalola et al.¹¹ Fracture of clavicle was more in males, may be due to more activity in males as compared to females.

We found fracture Patella (01.61%), out of which 69.57% were in males and maximum cases (34.78%) were in 21-30 yrs age group. similar finding (02.20%) and higher rate in males was reported by Scholes et al¹³

We found 00.91% cases were of fracture of ankle, out of which 69.23% in males and maximum (53.85%) were in 21-30 yrs age group. In contrast Babalola OM et al¹¹ reported 05.70%.

CONCLUSION

Maximum fractures were amongst males of 31-40 yrs age group. we could not find. We could not find second peak in males of 71-90 yrs age group. We found maximum fracture cases of femur amongst males among females too fracture femur comes more (39.89%) but much less than amongst males (60.11%).

Amongst male fracture of Acetabulum (87.50%), clavicle (82.50%), tibia-fibula (69.30%), Odontoid (100%), scaphoid (66.67%) ankle (69.23%), calcaneous (85.71%), radius (68.85%), dislocation (73.58%), forearm (63.25%), metacarpal (84.21%), olecranon (83.33%), patella (69.57%), ribs (100%), shaft hummerus (57.93%), metatarsal (100%) were more, may be also because the study had more male prepondence 916 males versus 511 females.

Amongst females maxilla, dislocation, communicated radius, fibula were more yet number more not substantial so a remark cannot be drawn.

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