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ORIGINAL RESEARCH ARTICLE

STUDY OF THE INCIDENCE OF DISTAL RADIUS FRACTURE

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ABSTRACT

The purpose of this study was to determine the different epidemiologic data on prevalence, age/sex, and etiology on distal radius fracture at East Avenue Medical Center, Philippines. Descriptive retrospective study with chart review was done and different essential data were retrieved and tabulated. The prevalence of distal radius fracture was approx 5.67% of total orthopedics referrals seen at Emergency Department, which is significantly lesser from the other similar studies done elsewhere. Age and Sex parameters showed bimodal peaks, one in adolescents and the other in elderly, with male-to- female ratio of almost 5:1 and 1:3.7 respectively. Most common mechanism of injury was Fall followed by Vehicular Accident and Sports injury. Our study showed similar results on sex and age distribution and mechanism that brings about distal radius fractures with other studies done elsewhere, however prevalence was significantly lower compared to others, probably due to initial consults with 'hilot', financial incapability and ignorance about the injury.

Keywords: *fracture, radius, epidemiologic data.*

INTRODUCTION

Importance of upper extremity for almost whole lots of things that happens in life can never be over emphasized. Distal radius fractures are the most common long-bone fractures, accounting for approx 20% to 25% of all acute fractures[1]. It is usually caused by a fall onto an outstretched hand. It can also result from direct impact or axial forces. This kind of fractures accounts for one sixth of all the ER consults (MCMurty et al., 1992). It shows bimodal distributions, peak occur at ages 5-14 years (Armstrong, 1998) and at ages 60-69 yrs (McMurty et al., 1992). Most wrist fractures occur in older postmenopausal women, with a female to male ratio 4:1 (Kakarlapudi, 2000). However, in adolescent boys and girls, the ratio is 3:1 because of their level of sports involvement (Armstrong, 1998). These injuries can cause significant disability if not managed properly[2].

Though knowing the incidence of any particular kind of injury is just the beginning of the treatment, it helps in narrowing down diagnosis, use of common treatment methodology, and preparedness in cases of urgency. While lots of researches have been done on distal radius fractures globally, local data on the incidence at different hospitals around the country haven't been done and or published, or we are not aware of any.

The purpose of this study was to determine the different epidemiologic data, specifically prevalence, age/sex, and etiology on distal radius fracture at our institute.

MATERIAL AND METHODS

This study is a descriptive retrospective study, undertakenat a 600-bed capacity urban tertiary level trauma centerwith an average annual census for surgical consults of about 20,000. Target population of the study was all theorthopedics referrals seen at ER. Study population was all the distal radius fractures' related referrals. All the patients with the distal radius fracture were included except pathological fractures. For this study, all surgical ER blotters from January 01, 2005 to December 31, 2005 were obtained from the medical records and necessary data were retrieved including total surgical consults, total orthopedics referrals, total number of distal radius fractures, mechanism of injury, age and sex of the patients. Likewise, all OPD charts and records were also retrieved and reviewed. Data were organized and tabulated.

RESULTS

Prevalence

Total number of surgery consults for the year was 21,635 out of which 1,957 were referred to the orthopedics service which is about 9% of the total surgery consults (Table 1). Similarly, total numbers of distal radius fractures were 111 which is 5.67% of total orthopedics referral.

Trauma compromised the total of 65% of ER consults,

followed by Hand (21%) and Adult (8.5%) (Table 2). Although trauma related injury was still the majority of cases at OPD, it was less in percentage compared to ER (Table 3). Trauma was followed by adult and hand in OPD. Prevalence of radius-ulna fractures and tibia-fibula fractures were almost similar in ER setting; while in OPD, radius-ulna fractures were more prevalent (Most common long bone fractures see at ER: Radius-Ulna: 39.6%, Tibia-Fibula: 39.5%, Femur: 14.4% and Humerus: 6.5%; Most common long bone fractures seen at OPD: Radius-ulna: 51%, Tibia-fibula: 33%, Femur: 10% and Humerus: 06%) (Table 2 & 3). Patients coming from Quezon City and Bulacan were almost similar in number (Table 4).

Table 1: Prevalence of distal radius fractures in various months

Month	No. of Surgery Consults	No. of Orthopedics Referrals	No. Of Distal Radius Fractures
January	2152	250	12
February	1741	147	09
March	2067	221	13
April	1989	201	08
May	1568	114	09
June	1852	118	08
July	1904	152	10
August	1848	190	12
September	1239	140	09
October	2059	159	07
November	1970	124	08
December	1246	141	06
Total	21,635	1,957	111

Table 2: Distribution of orthopedics referrals at the ER

Month	Joints	Long bone	Flat bone	Hand	Adult	Spines	Pedia	Total
January	30	83	36	65	20	10	06	250
February	20	51	22	28	14	08	04	147
March	34	77	35	40	22	08	05	221
April	32	73	32	34	19	07	04	201
May	15	42	16	21	11	05	04	114
June	15	43	17	23	11	05	04	118
July	18	61	22	35	12	02	02	152
August	26	73	25	46	14	03	03	190
September	18	45	20	30	15	04	08	140
October	25	62	19	33	15	02	03	159
November	19	48	18	19	09	06	05	124
December	16	51	27	42	03	01	01	141
Total	268	709	289	416	165	61	49	1,957

Table 3: Distribution of Orthopedics Referrals at OPD

Month	Trauma	Hand	Adult	Spines	Pedia	Total
January	45	13	35	05	16	114
February	48	12	38	07	16	121
March	532	16	39	10	18	135
April	40	10	31	03	13	97
May	45	12	33	05	09	104
June	32	08	24	03	12	79
July	30	08	22	03	08	71
August	33	08	23	04	11	79
September	34	10	25	04	09	82
October	34	09	26	05	07	81
November	38	11	29	04	09	91
December	42	12	29	04	09	91
Total	473	129	354	58	138	1,152

Table 4: Distribution of Distal Radius Fractures seen at OPD by Geographical Location

Location	Number
Quezon	City 39
Bulacan	38
Caloocan	City 10
Others	04
Total	91

Age/Sex Distribution

Adolescents' age groups and late fifty's age groups showed the peak in distal radius fracture (Table 5). While in younger age groups male-to-female ratio was almost 5:1; in older age groups it was slightly less than 1:3.7 showing reverse phenomenon.

Table 5: Age/Sex

Age Group (yrs)	Male	Female
01-05	0	01
06-10	12	02
11-15	16	04
16-20	06	01
21-25	04	0
26-30	02	01
31-35	02	0
36-40	03	01
41-45	05	02
46-50	03	0
51-55	03	03
56-60	03	08
61-65	03	14
66-70	02	06
>70	01	03
Total	65	46

Etiology

Fall onto an outstretched hand (FOOSH) was the most common cause of distal radius fractures among adolescents, while young adults suffered the condition due to sports related injury and vehicular accident (VA). In older population, fall and VA equally predisposed to the said condition.

Table 6: Mechanism of Injury

Age Group (yrs)	FOOSH	VA	Sports	Others
01-05	-	-	-	01
06-10	13	01	-	-
11-15	12	02	06	-
16-20	03	01	03	-
21-25	01	02	01	-
26-30	-	03	-	-
31-35	-	02	-	-
36-40	-	03	01	-
41-45	02	04	01	-
46-50	-	03	-	-
51-55	02	04	-	-
56-60	06	03	-	02
61-65	06	08	-	03
66-70	04	04	-	-
>70	03	01	-	-

DISCUSSION

Fractures of the distal radius have been discussed in surgical literature for over 200 years[4]. Being one of the most common fractures, distal radius fracture is encountered by an orthopedic surgeon day in and day out. Most distal radial fractures are diagnosed by conventional radiography. CT and MRI are used in complex distal radius fractures for the evaluation of associated injuries and for surgical planning. Characterization of fractures frequency is valuable in understanding the relative need for improved care for any particular fracture[4]. Although most common type of fracture injury, various factors including the radiographic fracture pattern, quality of bone, fracture displacement, comminution and energy of the injury, influence the preferred treatment of these injuries3, and eventually the desired outcome. Despite advances in fixation techniques, studies continue to report fair and very poor outcome after treatment. Thus, what seems clear is the continuing and perhaps increasing need for better precision and predictability in dealing with this common fracture that has an ongoing history of imperfect results[4].

The local data collected and published in 2004 by Philippine Orthopedic Association (POA) showed that Radius and Ulna fracture as the most frequently occurring injury accounting for as high as 77% of all the forearm fractures[5]. Although, distal radius fracture accounts for as high as 20-25% of all acute fractures[1], in our study it was slightly over 5%. We then tried to find the reasons behind it and therefore, started reviewing OPD data. Data from OPD showed that prevalence of radius-ulna fracture was much higher than that of tibia-fibula fracture. This showed that the majority of patient sought consultation at OPD at later date from the date of injury. Most of them had the history of consults at the traditional faith healer 'hilot' near them. Others came late for consult due to financial reasons. Most of the patients that had consults with 'hilot' were from Bulacan. This shows that 'hilot' still exist and people have faith on them especially in the provinces. Those from Quezon City also didn't seek the immediate consults which shows the lack of awareness among the people in urban areas regarding the consequences of not treating distal radius fracture and this finding is much similar with the finding of other studies done abroad.

The evolving demographics of distal radius fractures from various studies show two peaks of frequency, which are separated by the midlife years[4]. In our study also, bimodal peaks in frequency were noted, one in adolescents and the other in late fifty's. While male-to-female ratio of 5:1 in adolescents was slightly higher than that observed by kakarlpudi et al., 2000 which has 4:1, the female to male ratio of 3.7:1, in elder age group was comparable with various other studies.

Fall onto an outstretched hand (FOOSH) was the most common cause that brought about distal radius fracture, especially in young and elderly female population[6] as is also shown in various other studies done outside. Local data released by POA also revealed the fall as most common factor followed by VA to bring about any kind of fracture. Our study also showed fall as the leading cause, followed by VA, while sports related injury was third major culprit especially in young adult age group.

CONCLUSION

Our findings were similar to those that were observed in various other studies done outside on distal radius facture regarding mechanism of injury, age and sex predilections; however prevalence for the distal radius fracture was significantly lesser. This could be attributed to various reasons like, existence of 'hilot' and faith on them among the population, financial incapability and ignorance regarding the injury. Also, the fact that distal radius fracture doesn't lead to outright disability or incapability unlike that of the tibia or femur fractures in terms of ambulation, doing most of the minor chores and others, patient is not motivated to go for consult right after the injury.

The strength of the present study are that, the study was conducted in one of the urban tertiary hospital which serves over 2,000 orthopedics cases annually, catering to middle and lower socio-economic classes; data were gathered for whole year to increase sample size; this is probably the first of its kind on the said topic so the result can be used as local data. Our results suggest that prevalence of faith healer still exist and they do influence in management of distal radius fracture to various extend. The weakness of this study include, all inherent character of retrospective study including incomplete or limited data; sample size though looks enough, might not probably be good enough to come up with a very valid conclusions To come up with a more valid study, we recommend having a bigger sample size, if possible multicenter study. Aside from that, study on awareness regarding distal radius fractures, attitude of 'hilot' regarding distal radius fracture can also be done so that a comprehensive program can be launched to tackle with ever increasing morbidity from the said fractures.

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