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EPIDEMIOLOGY & CLASSIFICATION OF DISTAL END RADIUS FRACTURES : A RETROSPECTIVE STUDY IN A TERTIARY CARE HOSPITAL

Orthopaedics

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ABSTRACT

Background: Distal radius fractures are the most common of all fractures. The incidence of distal radius fracture has been studied frequently and shown to have increased over the years. The distribution of DRFs in the general population is bimodal with incidence peaks in young men and in postmenopausal women. DRFs in younger patients with good bone stock are most commonly associated with high-energy trauma, while low-energy trauma, e.g. fall from a standing position, is the most likely mechanism of injury in older patients due to underlying osteopenia/ osteoporosis. **Materials And Methods:** This retrospective study included 142 patients (95 males, 47 females) who sustained a distal end radius fracture in the last 2 years. All fractures were radiographically evaluated. DRFs were classified according AO classification. Data on age & gender was collected & statistical analysis was performed. **Result-** The study included 142 patients, with 66.90% being male and 33.10% female. There was a statistically significant difference in mean values between genders for some measured parameter (mean age or another metric), with females having a mean of 53.13 (SD 16.68) and males 40.01 (SD 18.20) (P value < 0.05). **Conclusion:** The study shows significant gender-based differences in the distribution across classifications, with certain categories showing a predominance of either males or females. This suggests potential gender-specific implications or differences within these classifications, which could be explored further in clinical contexts.

KEYWORDS

Fractures, radius, DRF, distal, bone.

INTRODUCTION:

Distal radius fractures (DRFs) represent the most common fractures in adults, showing an overall prevalence of 17.5% with respect to all fractures [1]. Many factors have been proposed to determine the source of the increasing rates of DRFs: lifestyle [2], environment [3], rise in life expectancy [4], increased obesity in childhood [5], and osteoporosis rate [6] in elderly population. Previous research [8–11] has demonstrated that DRFs occur mainly in pediatric males and in postmenopausal women, while a consistent incidence has been observed also in young adult men aged 19–49 years [7]. High energy trauma is the documented fracture mechanism in younger patients [8], while low- energy trauma, is the most common cause of injury in the elderly [2, 9, 10]. There are some early and late complications of the distal radius fracture. Early complications are circulatory problem, nerve injury, complex regional pain syndrome, ulnar corner pain, associated injury of the carpals [21]. The late complications are malunion, delayed union and non-union, tendon rupture, carpal instability, secondary osteoarthritis [21]. Little clarity emerges regarding the epidemiology of the fracture pattern [11] as DRFs are often identified with different eponyms, including Colles [12, 13], Smith [14], Barton [15], and Hutchinson fracture [16], instead of using a standardized classification system [7, 17], leading to uncertain clinical and radiological outcomes after both non-operative and surgical treatments [18–20].

The aim of this study was to describe epidemiology & fracture classification of distal radius fractures in a tertiary care hospital in Kolhapur.

Materials & Methodology:

The study population was all distal radius fracture patients who were treated at Dr. D.Y. Patil Hospital, Kolhapur from August 2021 to August 2023.The research sample was obtained from the medical record department of Dr. D.Y. Patil Hospital, Kolhapur & total 142 samples were obtained. The **inclusion criteria** for sample included in the research were distal radius fracture patients who were treated at Dr. D.Y. Patil Hospital, Kolhapur from August 2021 to August 2023 and their medical record data containing age, gender, type of fracture was collected.

Exclusion criteria

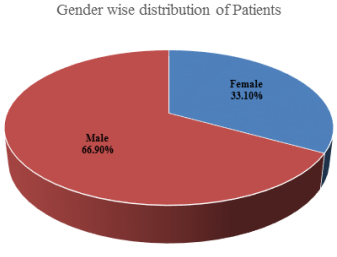
Were incomplete medical records such as not including age, gender, type of fractures.

Standard pre- operative anteroposterior and lateral radiographs of all patients were obtained from department of radiology to verify the diagnosis. Both inter observer reliability and intra observer reproducibility for the AO classification have been shown to be fair when dividing the fractures into the different sub-groups. When reducing the AO system to its three main types inter observer and intra observer agreement were reported to be substantial [22]. Therefore, we chose to classify the fractures into the 3 main AO types; type A is extra articular, type B is partial articular and type C is complete intra articular. The study type was retrospective.

RESULTS:

Table 1: Genderwise distribution of patients

Gender	No. of Patients	Percentage
Female	47	33.10%
Male	95	66.90%
Total	**142**	**100%**



Graph 1. Genderwise distribution of patients

Table 2: Genderwise distribution for classification

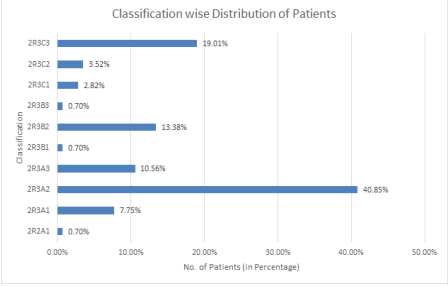
Gender	Mean	SD	P value
Female	53.13	16.68	0.000028*
Male	40.01	18.20	

*indicates significance (P value < 0.05)

Table 3: Classification wise distribution of patients

Classification	No. of Female Patients	Percentage	No. of Male Patients	Percentage
2R2A1	0	0.00%	1	1.05%
2R3A1	0	0.00%	11	11.58%
2R3A2	21	44.68%	37	38.95%
2R3A3	4	8.51%	11	11.58%
2R3B1	0	0.00%	1	1.05%
2R3B2	5	10.64%	14	14.74%
2R3B3	1	2.13%	0	0.00%
2R3C1	0	0.00%	4	4.21%
2R3C2	3	6.38%	2	2.11%
2R3C3	13	27.66%	14	14.74%
Total	**47**	**100.00%**	**95**	**100.00%**

Classification	No. of Patients	Percentage
2R2A1	1	0.70%
2R3A1	11	7.75%
2R3A2	58	40.85%
2R3A3	15	10.56%
2R3B1	1	0.70%
2R3B2	19	13.38%
2R3B3	1	0.70%
2R3C1	4	2.82%
2R3C2	5	3.52%
2R3C3	27	19.01%
Total	**142**	**100.00%**



Graph 2. Classification wise distribution of patients

DISCUSSION:

Gender Distribution: The study included 142 patients, with 66.90% being male and 33.10% female. There was a statistically significant difference in mean values between genders for some measured parameter (mean age or another metric), with females having a mean of 53.13 (SD 16.68) and males 40.01 (SD 18.20) (P value < 0.05).

Classification Distribution: The patients were categorized into various classifications, with the largest groups being 2R3A2 (40.85%) and 2R3C3 (19.01%). Each classification shows varying proportions of male and female patients.

Male vs. Female Distribution in Classifications:
In the classifications, 2R3A2 and 2R3A3 had more female patients (44.68% and 8.51% respectively) compared to male patients (38.95% and 11.58% respectively).

In contrast, classifications like 2R3B2 and 2R3C3 had more male patients (14.74% and 14.74% respectively) compared to female patients (10.64% and 27.66% respectively).

Several studies focused their attention of the epidemiology of DRFs [23, 24, 25]. However, some methodological weaknesses emerge; in 1999, Lindau et al. [24] performed an epidemiologic survey of 341 patients with DRF living in Sweden. Unfortunately, only young adults were considered, and all data were obtained from registries with no fracture classification. The same age limitation is present in a study by Diamantopoulos et al. [26], which considered only middle-aged and elderly population. In our series, the prevalence of DRFs was 6.8% with respect to all fractures in adult population. We found that the most frequent DRFs pattern was complete articular (64.3%) according to AO/ OTA classification, with no difference between genders. In our series, DRFs occurred mainly in elderly patients, who are more exposed to osteoporosis, and this maybe the reason for the higher prevalence of the most severe DRF pattern. This finding might be related to the fact that males have a greater aptitude for contact sporting activities and cycling compared with females. The current study has some limitations. Fracture classification was based only on X-ray images. CT scans for DRFs was performed only in case of displaced comminuted fractures for preoperative planning in the cases in which X-ray imaging was not sufficient for the choice of treatment and not as a classification tool.

CONCLUSION:

The study shows significant gender-based differences in the distribution across classifications, with certain categories showing a predominance of either males or females. This suggests potential gender-specific implications or differences within these classifications, which could be explored further in clinical contexts. The significant difference in mean values between genders also underscores the importance of considering gender in interpreting and applying the study findings.

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