

Section **Orthopaedics**

Original Article

Assessment of Prevalence of Fractures Among Children of Known Population: An Observational Study

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ABSTRACT

Background: The incidence of bone fracture is impacted by many factors including age and gender. Every third child is expected to sustain a fracture before age 17. Hence; we assessed the prevalence of fractures among children of known population.
Methods: A total of 100 patients who reported with bone fracture were included in the present study. Complete demographic details of all the patients were obtained. Detailed information in relation to the pattern and type of injury was also obtained. All the results were recorded in Microsoft excel sheet and were analyzed. **Results:** There were 63 males and 37 females. Incidence of fractures was significantly higher in males in comparison to females. Radius was the most common bone to be fractures, found to be present in 27 males and 15 females.
Conclusion: Fractures among pediatric population are significantly more common in males, with radius being the most common bone to be fractures.


Keywords: Children, Fractures, Prevalence

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INTRODUCTION


Injury-related bone fractures contribute to an increase in morbidity, death, disability, and health expenditures across the age span. The incidence of bone fracture is impacted by many factors including age, race, gender, biology, physiology, body habitus, environmental exposure to fracture-producing injury mechanisms and access to prevention programs.¹⁻³ Every third child is expected to sustain a fracture before age 17. Previous work has shown a variation in the incidence of fractures with age. Also, in all epidemiological studies of fractures in children known to us, approximately 60% of all fractures occur in boys.^{4,5} Hence; we planned the present study to assess the prevalence of fractures among children of known population.



METHODS

The present study was planned in the department in the department of pediatric medicine of the medical institute and it included assessment of prevalence of fractures among children of known population. Ethical approval was obtained from institutional ethical committee and written consent was obtained after explaining in detail the entire research protocol. A total of 100 patients who reported with bone fracture were included in the present study. Inclusion criteria for the present study included:

- Patient less than 18 years of age,

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- Patients with negative history of presence of any bone metabolic disorder,
- Patients with negative history of presence of any other systemic illness

Complete demographic details of all the patients were obtained. Detailed information in relation to the pattern and type of injury was also obtained. All the results were recorded in Microsoft excel sheet and were analyzed.

RESULTS

In the present study, a total of 100 pediatric subjects were analyzed. Mean age of the subjects of the present study was 14.5 years. There were 63 males and 37 females. Incidence of fractures was significantly higher in males in comparison to females. Radius was the most common bone to be fractures, found to be present in 27 males and 15 females. The overall incidence of radius bone involvement in fractures was 42 percent.

Table 1: Prevalence of fractures among males and females

Gender	Number	p- value
Males	63	0.04 (sig)
Females	37	

Graph 1: Prevalence of fractures among males and females

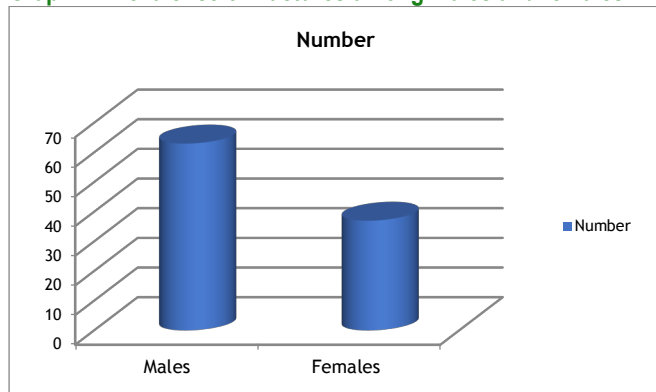


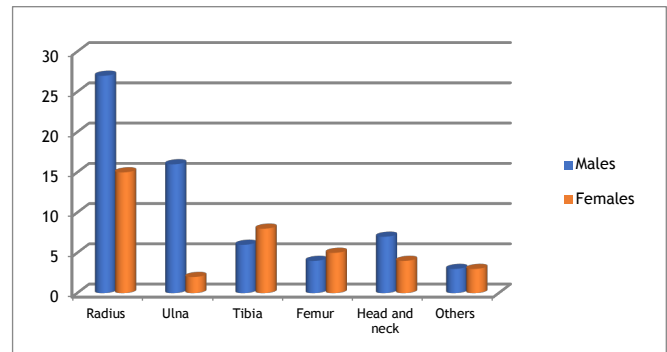
Table 2: Bone affected in fractures

Bone affected	Males	Females	Total
Radius	27	15	42
Ulna	16	2	18
Tibia	6	8	14
Femur	4	5	9
Head and neck	7	4	11
Others	3	3	6
Total	63	37	100

DISCUSSION

Fractures are also common in individuals with spinal cord injury. In a population-based study, the crude fracture rate for patients with spinal cord injury was 2% per year. Those with lumbar lesions had more fractures than did those with cervical lesions (13). These data support the notion that environmental factors related to activity contribute to fracture rates in this population. Physiologic factors have also been

identified.⁶ In the present study, a total of 100 pediatric subjects were analyzed. Mean age of the subjects of the present study was 14.5 years. There were 63 males and 37 females. The difference in timing of the peak incidence for boys and girls reflects differences in growth between the sexes. The peak incidence coincides with the pubertal growth spurt, when there is a relative decrease in bone mineral density due to bone expansion and insufficient mineralization.⁶⁻⁸



Graph 2: Bone affected in fractures

In the present study, the incidence of fractures was significantly higher in males in comparison to females. Randsborg PH *et al* quantified the fracture rate per exposure time for the most common sport and recreational activities. They prospectively evaluated all children younger than sixteen years who presented to our institution with a new fracture within a twelve-month period. Exposure time to the most common childhood activities was measured by means of interviewing random parents from the study population. The main outcome measures were the annual fracture incidence in the population and fracture rates per 10,000 hours of exposure to various sports and recreational activities. A total of 1403 fractures were included. The overall annual incidence was 180.1 fractures per 10,000 children younger than sixteen years. The distal part of the radius was most often fractured. Snowboarding was associated with the highest activity-specific fracture rate, estimated to be 1.9 fractures per 10,000 hours of exposure. In comparison, the fracture rate per 10,000 hours of exposure was 0.79 for handball, 0.44 for soccer, and 0.35 for trampolining. The distal part of the radius is the most common fracture site in childhood.⁹

In the present study, Radius was the most common bone to be fractures, found to be present in 27 males and 15 females. The overall incidence of radius bone involvement in fractures was 42 percent. Dosa NP *et al* determined the age-specific incidence, prevalence, and characteristics of fractures in persons with spina bifida. Two hundred twenty-one consecutive patients aged 2-58 years evaluated in 2003 at a regional referral center. Twenty percent (n=44) were children age 2-10 years; 30% (n=68) were adolescents age 11-18 years; and 50% (n=109) were adults age 19-58 years. Fifty-five percent (n=121) were female; 64% (n=141) had shunted hydrocephalus. Fifty-eight percent (n=129) were community ambulators. Defect levels included 14% (n=31) thoracic; 37% (n=81) mid-lumbar; 35% (n=79) low-lumbar; and 14% (n = 30) sacral. Annual incidence of fractures among children, adolescents, and adults was 23/1000; 29/1000; and 18/1000, respectively. Overall prevalence was 200/1000. One in 4 patients with fractures reported multiple fractures. Median age at first fracture was 11 years. Most fractures involved the

femur or tibia. Comparisons between adult- and childhood-onset fractures were not significant for difference in sex, BMI, defect level, functional independence, shunted hydrocephalus, epilepsy, or other congenital anomalies. Fractures in persons with spina bifida are most common during early adolescence.¹⁰

CONCLUSION

Under the light of above obtained results, the authors conclude that fractures among pediatric population are significantly more common in males, with radius being the most common bone to be fractures. However; further studies are recommended.

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