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Pattern of Orthopedic Fractures among Pediatric Patients attending the Emergency Department of GMC Jammu

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Abstract
Introduction: *The aim of this study is to analyze the pattern of orthopedic fractures among pediatric patients presenting to the emergency department of GMC Jammu.*
Methods: *In this prospective study details of 962 pediatric patients in age group of 0 to 16 years with male female ratio of 626:336 presenting to the emergency department of Govt. Medical College Jammu, were recorded for a period of 2 years from June 2016 to May 2018. A total of 1005 fractures were diagnosed among all these patients and placed in a proper tabular form and final inference was drawn from these tables.*
Results: *In our study a total of 962 pediatric patients reported to our emergency with orthopedic fractures. Maximum no. of these patients belonged to 6-11 years of age and males (626) predominated the females (336) in terms of number. This age group [6-11years] also contributed to the maximum no. of fractures that we encountered. Upper limb fractures (77.9%) were far more common among these patients than lower limb fractures (22.1%).*
Conclusion: *A significant relation of fractures with male gender and 6-11 year age group was noticed as males sustained more fractures in comparison to the females both overall as well as in their respective age groups. Lower limb fractures in these pediatric patients are nearly 1/3rd of fractures of upper limb.*
Keywords: *Pediatric Fractures, GMC Jammu, Orthopedic Fracture Pattern.*

Introduction

Rennie et al. 2007 after analyzing the basic epidemiology of different fractures in British children reported that falls account for 57% of all fractures, with male predominance. Fractures are a very common event in childhood especially in school going age. Fall is the most common mechanism leading to fractures in children and these falls are sustained mostly at home followed by playground and footpath. RTA is second common cause for these fractures in this age group.

Fractures in this age group needs a special attention as we need preventive strategies to decrease their number as the circumstances under which these fracture occur may put the life of these patients in grave danger. These fractures represent a major public health problem. These fractures are more common among males probably due to behavior, activity level, bone quality, BMI etc it is to be noted here that almost all of these patients who presented to our emergency deptt. were healthy otherwise. These fractures are a matter of worry not only because they may be fatal for the child but also because it has been demonstrated that a first fracture at this age is associated with increased risk of sustaining subsequent fractures, hence the risk factors need to b addressed.

Incidence of fractures from birth till 16 years of age is more in boys (42%) and girls (27%) Wilkins 1996 and the commonest site involved is distal radius, Hand, Elbow, Clavicle, Radius, and Tibia. Bones in children have thick periostium as compared to adults and they tend to bend instead of breaking, most of the times fractures are partial and do not cross to the opposite side of cortex.

Methods

This is a prospective study of 962 pediatric patients who presented to our emergency with history of trauma. After proper management and stabilization according to our protocol, x-ray of the injured part was done to radiologically confirm the fracture for all these patients and final diagnosis made. These patients were divided in three age groups; pre-School group 0 to 5 years, School children group 6 to 11 years and adolescents 12 to 16 years. This study continued for 2 years from June 2016 to May 2018 recording details of all the pediatric patients diagnosed with fracture. 43 patients were diagnosed with >1 fractures and rest of the patients sustained isolated fractures. Among 962 patients 204 children had associated head injuries. Details which we recorded are: Age, Sex, Mode of Injury, Time of Injury, Associated Head injury if present, and Place of injury. All the patients in this study are in the age group of 0 to 16 years with Male Female ratio of 626:336.

Results

We analyzed the data we collected and placed it in tabular format to show the pattern of fractures among pediatric patients as shown below:

Table 1 Age groups with No. of patients in each age group.

Age Group	No. of Patients
0-5 years	197
6-11 years	493
12-16	272
Total	962

Table 2 Gender distribution

Age Group	Male: Female
0-5 yrs	111:86
6-11 yrs	302:191
12-16 yrs	213:59

Table 3 Fracture Incidence acc. to the age group

Age Group	No. of Fractures
0-5 yrs	201
6-11 yrs	517
12-16 yrs	287
Total	1005

Anatomical Location of Fractures in these Patients

Table 4 Location in Lower Limb

Site	0-5 yrs	6-11 yrs	12-16 yrs
HIP #*NOF**, # Pertrochentric	4	-	-
# SOF***	21	35	27
# Tibia	17	49	46
Foot/Ankle	2	8	9
Total	44	92	82

*Fracture

** Neck of Femur

***Shaft of Femur

Table 5 Location in Axial Skelton

Site	0-5 yrs	6-11 yrs	12-16 yrs
Cervical Spine	1	1	-
Dorsal Spine	-	-	-
Lumbosacral spine	-	-	2

Table 6 Location in Upper Limb

Site	0-5 yrs	6-11 yrs	12-16 yrs
Clavicle	10	35	7
Proximal Humerus	2	6	6
Shaft of Humerus	3	15	9
Distal Humerus (Sup/Lat/Med/ Intercondylar)	92	183	30
Elbow dislocation	0	5	5
Radius(DER*)	11	22	51
Ulna	5	9	15
Both bones of Forearm	30	146	75
Hand	3	3	5
Total	156	424	203

*Distal End of Radius

Discussion

In this prospective study 962 patients in age group of 0 to 16 yrs presented to orthopedic emergency of GMC Jammu within a period of 2 years i.e. June 2016 to May 2018. Fractures were more common in males (65.1%) than females (34.9%) which indicate that males are more exposed to the risk factors causing these fractures. 197(20.48%) patients were in age group of 0-5 years, 493(51.25%) patients in 6-11 years age group and 272 (28.27%) patients were in 12-16 years age group. This shows that fractures were more common in 6-11 year age group. 783 fractures were seen in upper limbs that too in age group of 6-11 years, 218 fractures in lower limbs and 4 fractures in spine.

A total of 1005 fractures were recorded in these 962 patients with 43 patients having more than 1 fracture and remaining patients presented with isolated fractures, 204 patients presented with associated head injury.

Most common cause of injury was fall at home [fall on ground > fall from height] followed by fall in playground and footpath. Second common cause of injury was RTA.

The peak incidence of fracture is roughly 3 years earlier in girls than boys (11 and 14 years respectively) Cooper C et al. 2004.

Williams et al. reported that socio-
-economical status of parents was related to circumstances in which injury events occurred in adolescents, influencing the extend and type of risk behaviors.

Clark et al. 2008 showed a positive relation between childhood fractures and vigorous physical activity that was independent of bone mass.

Johnson JG et al. in 2002 and Ma D, Jones G in 2004 in their case study reported that increased time spend watching TV or playing computer games may lead to obesity with bad eating habits which may place a children at increased risk of fractures.

Conclusion

From this study of 1005 pediatric fracture patients we came to the conclusion that there is a significant relation of fractures with male gender and school going children (6-11 year) age group, as males sustained more fractures in comparison to the females both overall as well as in their respective age groups. Lower limb fractures in pediatric patients are nearly 1/3rd of fractures of upper limb. We need to address the risk factors associated with these fractures and that is possible only after we are able to understand the epidemiology of these fractures, this study is a small step to make a

difference by identifying the high risk groups, common fracture patterns and the factors associated.

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