Epidemiology of Paediatrics Fractures Admitted at Ghurki Trust Teaching Hospital

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ABSTRACT

Objective: To identify the epidemiology of pediatric fractures and frame preventive measures to diminish Orthopaedics trauma.

Methods: This retrospective study included 476 children of age between 0-15 years of either sex admitted through emergency or OPD between 1st Jan 2015 to 31st Dec 2015 having different type of fractures. The data were taken from hospital database and variables were included like age, sex, date of admission, date of discharge, type of fracture, mechanism of injury, and location of bones . The results were analyzed using SPSS 17.0.

Results: Total 476 patient's data was collected; out of which 387 (81.3%) were male and remaining 92 (19.3%) were females. Male to female ratio was (M:F, 4.21:1) with mean age of 8.3 ± 1.3. 212 (44.5%) patients had fractures due to fall, 96 (20.2%) had sports injury whereas 168 (35.3%) were injured in road traffic accident. Age ranged from 0 -15 years. One hundred and forty two (29.8%) patients had humerus fracture, (21.72%), 78(16.4%) patients had radius and ulna isolated or both bones fractured, 12(2.50%) patients had carpals and metacarpals fractures, 134(28.2%) patients had femur fracture and 85(17.9%) patients had tibia fracture.

Conclusion: This study concludes that humeral fractures are a main concern in pediatric age group because it having a common public, cost-effective and emotional effect on community. It is important to provide injury prevention education and resources to families in the community. There is need to promote programs and policies at the local, provincial and national level that protect children.

Key Words: Pediatrics, Fractures, Epidemiology

INTRODUCTION

Trauma is a well-known cause of mortality and disability worldwide [1] Fractures occur more frequently in children as compared to the elders. Before celebrating their 17th birthday, around 33.33%. In Sweden before celebrating the 17th birthday, around 33.33% of all children suffer at least one fracture and fractures are the cause of 9% of all injuries in children that come to the attention of health services [2]. It is also globally estimated that the risk of having a fracture in childhood among boys are greater i-e 42%-64% as compared to girls i-e 27%-40% [3]. Alexander in his study estimated that every forth children in world suffer from some type of injury annually while among these injuries 10-25% of children having associated bone fracture [4].

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In USA, 50% of the mortality in children after the first year of life is trauma with an injury occurring every 4 minutes and a death every 6 minutes [5]. Several factors play their role for higher occurrence of fractures in children. The configuration of fractures differs amongst different countries of the world and surprisingly different areas of same country, varying on weather, culture as well as extra activities [6]. Ramesh et al also focused on different social factors for higher incidence of fractures in children [7]. Almost all bones are exposed to fracture in children especially the radius /ulna is the mostly involved bone in children [8].

Our country has very limited statistics of the epidemiology of fractures regarding pediatric population. The main focus of our study was to identify the epidemiology of pediatric fractures and frame different safety measures to diminish such traumas.

METHODS

This retrospective study was carried out at Orthopaedics and Spine Centre of Ghurki Trust

Teaching Hospital; Lahore. It is a tertiary care hospital and consists of 1000 beds. The data had been collected from hospital database after hospital ethical committee approval and permission from concerned department. Four hundred and seventy six patients of paediatrics aged i-e 0-15 years of either sex admitted either through OPD or emergency department were included excluding those managed as an OPD case. The variables include patient's age, sex, mechanism of injury, bones involved, date of admission and types of injury. A total of 476 patients were included in our study. Patients were grouped into 3 categories according to age distribution i-e ≤ 5, 6- 10 and 11-15years. The fractures were simply divided into 2 categories i-e open and closed fractures. All data were initially recorded on a printed proforma and then were entered into SPSS version 17.0. Frequencies and percentages were calculated. Data was presented in tables and graphs where necessary.

RESULTS

Total 476 patient's data was analyzed retrospectively. 384 (80.7%) were male and 92 (19.3%) were females. Male to females ratio were 4.21:1 with mean age of 8.3 ± 1.3. Age ranges from 0 -15 years. Between age ≤ 5 years 114 (23.9%) of patients were admitted, 154 (32.4%) of patients were between 6-10 years and 208 (43.7%) were between 11-15 years. (table 1)

Table 1: Distribution by Age and Sex

		Frequency	Percent
Sex	Male	384	80.7
	Female	92	19.3
Age	≤ 5	114	23.9
	6-10	154	32.4
	11-15	208	43.7

According to fracture classification, 443 (93.1%) of the patients had close fractures while 34 (6.9%) had open fractures. The presentation of patients and admission vary in different months. July, August and September having maximum number of admissions i-e 10.08%, 11.97% and 10.9% while Jan and October having least i-e 6.51% and 6.3% .

The mechanism of injury was different in different age groups. In a nutshell, 212(44.5%) of the patients having fractures due to fall, 96(20.2%) having sports injury while 168(35.3%) having road traffic accident. (FIG 1)

Bones involvements were different in different patients, 142 (29.8%) patients had humerus fracture, 78 (16.4%) patients had isolated radius and ulna or both fracture, 12 (2.50%) patients had carpals and metacarpals fractures, 134 (28.2%) patients had Femur fracture, 16 (3.4%) patients had tarsals and metatarsals fracture, 85 (17.9%) patients had Tibia fracture, 2 (0.40%) patients had patella fracture, 4 (0.8%) patients had any joint dislocation, 2 (0.4%) patients had spine fracture, 1 (0.20%) patients had pelvic fracture (table 4).

Figure 1: Frequency of different modes of injury

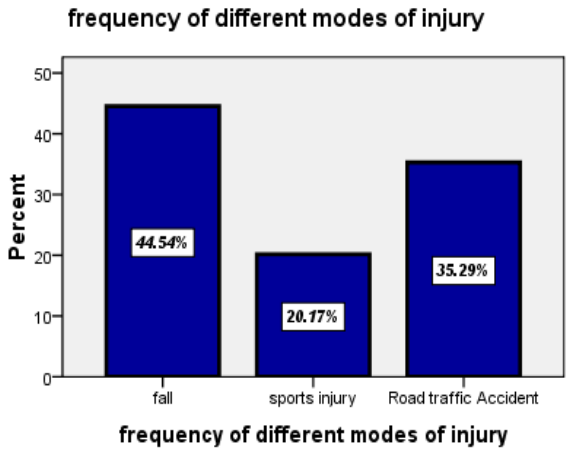

Table 4: Frequency Of Different Bones Fracture;

Bone	Frequency	Percent
Humerus	142	29.8
Radius And Ulna	78	16.4
Carpals And Metacarpals	12	2.5
Femur	134	28.2
Tibia	85	17.9
Tarsal And Metatarsals	16	3.4
Patella	2	.4
Dislocations	4	.8
Spine Injury	2	.4
Pelvic Injury	1	.2
Total	476	100.0

Table 5 shows different bone fractures in different groups. Humerus fractures were most common in ≤ 5 and 6-10 years in our population while in 11-15 years old child the femur followed by tibia were the most commonly fractured bone.

Table 5: Cross tabulation of distribution of fractures by different age groups;

	Distribution by age(%)			Total (%)
Bone	≤ 5	6-10	11-15	
Humerus	11.56	11.97	6.30	29.83
Radius And Ulna	1.47	6.30	8.62	16.39
Carpals And Metacarpals	0.42	0.84	1.26	2.52
Femur	6.72	7.56	13.87	28.15
Tibia	2.731	4.62	10.50	17.85
Tarsal And Metatarsals	0.84	0.84	1.68	3.36
Patella	0	0	0.42	0.42
Dislocations	0.21	0.21	0.42	0.63
Spine Injury	0	0	0.42	0.42
Pelvic Injury	0	0	0.21	0.21
Total	23.95	32.35	43.70	100

DISCUSSION

Fractures are very common in childhood. The mechanism and pattern of paediatrics fractures vary in different countries and even with in the same country. Different studies are available on the epidemiology of childhood fractures [8, 9, 10, 11] In our study a total of 476 patients were included. Males were most commonly affected as compared to females. However in most studies the males are maximally affected three times more to female while in our study the male to female ration were 4.1:1. The reason behind the higher proportion of males to females is social cultural and religious factor as most of the females get restricted to home as they enter adolescence and hence there is less exposure to outdoor activities. Male predominence was also seen in other studies [11,12,13].

The finding in our study was the higher percentage of fractures in children between 11-15 years. Two hundred eight (43.7%) of children having fractures between 11-15 years followed by children between 6-10 years and the children between 0-5 were least affected. The reason behind it is the increase outdoor activities by older children and least by the children up to 5 years. Tandon 2007 [5] all study having the children between 7-12 years were mostly affected [5] while in Gupta and Chichom study the children between 6-14 were mostly injured because of more outside door activities [9, 13]

A spectrum of causes and types of trauma affected our children. Our data indicated that fractures were mostly due to fall i-e 212 (44.5%) followed by road traffic accidents i-e 168 (35.3) while only 96 (20.2%) had fractures due to sports injury. Fall has been found as the leading cause of fractures in most of the studies [2,12,13]. Gupta HK in his study found that road traffic accidents were the leading cause of fractures in children while falls were the second cause [9]. The reason behind it was the same i-e more outside home activities. Its innapropriate trying to correlate outdoor activities of children to raod traffic accidents

Paediatrics patient's admission varies in different months. In our study the fractures were most common in the months of summer vacations i-e july, August and September while Jan and October having least. The higher percentages of fractures in these months are because of the high outdoor activities due to summer vacations. While in Jan the least fractures are due to winter season and most of the people get restricted to home because of cold. Myranp. A [6] study also concluded that most of the fractures occur during winter and summer vacations.

Regarding the bones involvements, the overall upper limbs fractures were 48.7% and lower limb fractures were 49.9%, which is slightly higher than upper limb fractures. Lower limb fractures most common as compared to upper limb in other studies also [9]. Some studies found the upper limb bones are most commonly involved [12,14].

The most common bone fracture were humerus i-e 142 (29.8%) followed by femur fracture i-e 134 (28.2%). Among the humeral fractures the supracondylar fractures were most common i-e 117 (82.39%) followed by humeral shaft 20 (14.08%) and least is

proximal humerus i-e 5 (3.52%). Brudvik C [10] in their study found that the long bones of forearm i-e radius and ulna especially their distal parts were the most commonly involved bones. Also in some other studies [2,11] while in our study the radius /ulna found to be the fourth common bone fractured. So as compared to all other studies [6.8,12,14], Our study findings is different in that the humeral fractures are most common in our population. The reason behind is the mechanism of injury i-e fall. During fall the first part of upper limb that encountered to the ground is the elbow joint and hence supracondylar fractures of the humerus is more common as compared to fractures of other bones.

A few suggesstions need to be addressed. First, the age wise group distribution were divided on the basis of administrative factors rather than for management purpose. Second, the data of this study included only those children who were admitted in ward while the patients who were managed as an OPD case were excluded as no data was available. Therefore future studies are required which will provide more valuable clinical information.

CONCLUSION

This study concludes that humeral fractures are most common in paediatrics age group. It is the first study to give an explanation of the epidemiology of pediatric fractures in a tertiary care teaching hospital Lahore. According to the present data collection system, unintentional injuries (especially falls), sports injuries and road traffic accidents were the most prominent mechanisms of injury in these age groups. It is important to provide injury prevention education and resources to families in the hospital as well as in the community. There is a need to promote programs and policies at the local, provincial and national level that protect children.

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