

VÝSKYT DETSKÝCH ZLOMENÍN A LUXÁCIÍ VO FAKULTNEJ NEMOCNICI NA SEVERE JORDÁNSKA

THE INCIDENCE OF FRACTURES AND DISLOCATIONS IN CHILDREN AT THE TEACHING HOSPITAL IN NORTHERN JORDAN

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Vol. 4, no. 2, 129–134

Summary

The study aims to determine predominance of fractures and dislocations in children diagnosed and treated at the Orthopaedic Clinic of the teaching hospital in the city Irbid in northern Jordan. Another goal of the research was to set up a database for further research. The database should help to improve efficiency of examinations and check-ups and reduce the prevalence of fractures and dislocations in children population.

The method of cross-sectional study was used for this research, based on records of fractures and dislocation cases in children, which have been treated according to the latest knowledge in orthopaedics and traumatology at the Department of Emergency Medicine in Teaching Hospital in Irbid during one year.

According to records there were 2888 patients suffering from fractures and dislocations. 912 of them suffered fractures and dislocations of elbow, 862 fractures and dislocations of forearm, 443 fractures and dislocations of ankle and leg, and 671 other fractures and dislocations. 1883 patients (65%) were men and 1005 patients (35%) were women. Most cases of fractures and dislocations occurred during summer.

Fractures and dislocations in children are well-known problems. Fractures of the distal end of the radius and subluxation of its head are the most frequent trauma injuries in children in the city Irbid in Jordan. Proper prevention program can effectively reduce the number of injuries and their severity. In summer, the number of injuries increases.

Key words: fractures in children – dislocations in children – gender – age

Súhrn

Cielom štúdie je zistiť prevahu zlomenín a vyklbení detského veku diagnostikované a ošetrené na ortopedickej klinike Fakultnej nemocnice v meste Irbid na severe Jordánska a urobiť databázu pre ďalší výskum, aby sa zvýšila efektívnosť vyšetrovania a kontroly a znížila prevalencia detských zlomenín a luxácií v našej populácii.

Metódou je prierezová štúdia, ktorá vychádza zo záznamov prípadov detí zo zlomeninami a luxáciami, ktoré boli ošetrené podľa najnovších vedomostí v ortopédii a traumatológii na oddelení urgentnej medicíny Fakultnej nemocnice v meste Irbid počas jedného roka.

Podľa záznamov bolo 2 888 pacientov zo zlomeninami a vyklbeninami, 912 boli zo zlomeninami a vyklbeninami okolo lakťa, 862 zo zlomeninami a vyklbeninami predlaktia, 443 zo zlomeninami a vyklbeninami členka a nohy, 671 iné zlomeniny a vyklbenia. Mužského pohlavia bolo 1 883 pacientov (65 %) a 1 005 pacientov (35 %) bolo ženského pohlavia. Väčšinu zlomenín a vyklbení sme zaznamenali v letnej sezóne.

Zlomeniny a luxácie v detskom veku sú známe problémy. Zlomeniny distálneho konca rádia a sublúxiacie hlavy rádia sú najfrekvencovanejšie traumy detského veku v meste Irbid v Jordánsku. Správna prevencia môže efektívne redukovať počet a závažnosť úrazov. V lete sa počet úrazov zväčšuje.

Kľúčové slova: detské zlomeniny – detské vyklbeniny – pohlavie – vek

Introduction

The bones of children and adults share many of the same risks for injury. However, child's bones are also subject to unique forms of injury due to their soft, developing bone (18, 23). Various types of fractures include:

Displaced fracture: A complete break in the bone, in other words, it is a fracture in which the two pieces of bone are completely disconnected. A considerable amount of force is required to cause this fracture. Because the bones are disconnected, the healing time is usually longer than in other fractures. Also, frequent follow-up is necessary to make sure the bones stay lined up properly (14, 16, 18).

Plastic deformity: In this fracture, the bone bends without any visible break or fracture and does not return to its original shape. Usually the bone must be "repent" back to a normal position. A cast is always required (8, 19, 22).

Torus (buckle) fracture: This is perhaps the most common fracture in young children. It occurs only in children because of their soft bones. When such a fracture occurs, it is as if the bone was driven together from end to end and simply buckled under the pressure. Very often, children with this type of fracture will complain of pain for a day or two before they are seen by a doctor, because children fall or injure themselves so frequently, parents often wait to see if the problem resolves itself. With a Torus fracture, the bone does not have to be put back in place and the limb is fixed in a cast for comfort. The healing time is brief and usually lasts no more than three weeks (18).

Greenstick fracture: This fracture is unique to children and involves one side of the bone breaking while the other side bends exactly like bending a green stick. Often, the bone must be bent back into place before it is put into a cast. Healing of these fractures can take longer, because they usually occur in the

middle, slower-healing portion of the bone (19, 22).

Growth plate fractures: occur at or near the bone's growth region, and due to this anatomical importance, require immediate attention because the long-term consequences resulting in limbs that are crooked or of unequal length (4, 19, 21).

Elbow dislocation is the most common dislocation in children's age groups after radial head subluxation (pulled elbow) (11), which shows a high incidence between age group 2–6 years (17).

Children's elbow fractures are different from many other children's injuries. They are associated with a relatively high rate of complications, and the results of non-operative management are not always good (2, 9, 14, 16). The child's elbow is well vascularised, and therefore fracture healing takes place very quickly. Such a narrow window of opportunity makes it imperative that the fracture be properly managed very quickly (9, 14, 16).

Purpose

To determine the prevalence of children's fractures and dislocations in North province in Jordan and to make a data base for further researches, to be effective in investigating, controlling, and preventing children's fractures and dislocations in our population.

Methodology

This is a cross sectional study the case records of children with fractures and dislocations that were seen at the orthopaedic emergency department of Teaching Hospital during the year 2004. The case records of 2888 patients at children's age groups (<16 yrs.) who were attending to the orthopaedic emergency department in Princess Basma teaching Hospital who had undergone management for fractures and dislocations by orthopaedists according

the last knowledge in orthopaedic trauma during the year 2004. These records were studied and analyzed by Microsoft office excel program.

Results

There were 2888 patients with fractures and dislocations. 912 (32%) patients were treated for around elbow fractures and dislocations (including pulled elbow). 862 (30%) were forearm fractures (including distal radius). 443

(15%) were ankle & foot fractures and dislocations. 338 (12%) hand fractures and dislocations. 333 (12%) other fractures and dislocations (see Table 1).

Distal radius fracture was the most common fracture. 666 cases (23.1%) in children's age group followed by pulled elbow (529 cases (18.3%)), foot & ankle fractures, supracondylar fractures of humerus and hand fractures (see Table 2).

Table 1 Relative frequency of specific fractures and dislocations by anatomic site

Anatomic site	Number of patients	%
Around elbow	912	32
Forearm	862	30
Ankle & foot	443	15
Hand	338	12
Leg	125	4
Around shoulder	85	3
Pelvic & hip	92	3
Around knee	31	1
Total	2888	100

Table 2 Specific fractures distribution

Anatomic site	Number of patients	%
Distal radius	666	23.1
Pulled elbow	529	18.3
Ankle & foot	272	9.4
Supracondylar elbow	257	8.8
Hand	251	8.7
Others	913	31.7
Total	2888	100

Figure 1 shows two peaks for the incidence of fractures and dislocations according to the age groups. The first peak at the age group (1–4 yr.)

and the second peak at the age group (7–10 yr.). The lowest incidence was among age group (<1 yr.).

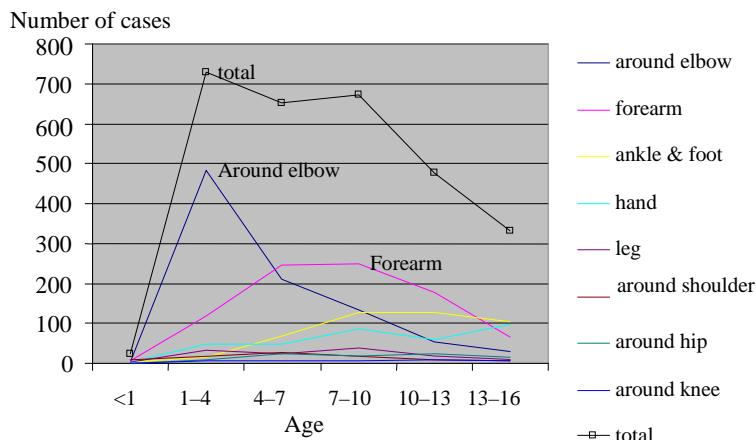


Figure 1 Age distribution of children's fractures and dislocations

Gender distribution of 2888 children with fractures and dislocations, 1883 (65%) were males,

1005 (35%) were females (see Figure 2).

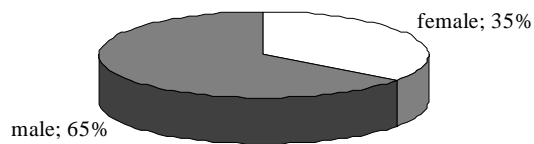


Figure 2 Gender distribution of children's fractures and dislocations

Total male to female ratio of children's fractures & dislocations is 1.87:1. For patients with pulled elbow (529)–311 (59%) were females, 218 (41%) were males, given a female to male

ratio 1:1.43. The male to female ratio for all fractures and dislocations excluding pulled elbow was 2.4:1 (see Table 3).

Table 3 Male to female ratio of children's fractures & dislocations

	Female (F)	Male (M)	Ratio M:F
Total	1 005	1 883	1.87:1
Pulled elbow	311	218	1:1.43
Total except pulled elbow	694	1 665	2.4:1

Discussion

The literature shows that the prevention of children's trauma is the best way to solve the problem. The study in Australia shows that the trauma of upper limbs is 77.7% and males accounted for 69.7% of all childhood limb fractures (12). The study in India shows in children aged 0 to 6 years, the most common injured site was the elbow, whereas in children aged 7 to 16 years it was the distal radius, and males accounted for 54.8% of all childhood limb fractures (20). The study in Norway shows males accounted for 62.4% of all childhood limb fractures and the trauma of upper limbs is 77.7% of all children's fractures and the forearm diaphysis is the most common (10). The study in U.K. in Edinburgh, Scotland shows that the incidence of fractures was 20.2/1000/year and that 61% of children's fractures occurred in males. The incidence of fractures increases with age; the majority of fractures in children involve the upper limb (15). The study in U.K. shows the annual incidence rate of fractures in children less than or equal to 12 years of age living in Nottingham is 16/1.000 individuals. Fractures are rare in those less than 18 months of age and incidence increases with age. Fractures of the distal radius and ulna accounted for 35.8% of all fractures seen, with hand fractures the second largest group (14.7%) (24). In the retrospective study that underwent in Ontario, Canada between 1996 and 2000 they found that 62% were male, 29 % were between the ages of 10 and 14 years, 27% between 5 and 9 years, 16% between 15 and 17 years, 15% between 1 and 4 years, and 13% less than 1 year old (13). In the screening all population in England 2004 showed that prevalence of trauma in age 0–14 years was 4.9% in white population and 2.9% in non-white population (7). The study

in Britain on 52,624 boys and 31,505 girls shows the incidence rate of fractures in children 1.3% per year and fractures were more common in boys 63.7%. The most common fracture in both sexes was that of the radius/ulna (30%), peak incidence at 14 years of age among boys and 11 years of age among girls (5). The study in South African in 2008 shows that (22%) children had sustained a fracture one or more times during their lifetime (males 27.5% and females 16.3%). The percentage of children fracturing differed between the ethnic groups (White 41.5%, Black 19%, mixed ancestry 21%) (21).

The study analyzed 2888 patients with fractures and dislocations in children's age group. The most common site of fractures was at distal radius (23.1%), which agreed with studies, which shows that distal radius fracture is the most common among children in U.K. 30–35.8% (5, 7, 15, 23, 24).

The incidence of fractures and dislocations among children showed two peaks, first one at the age group (1–4 yr.), this is due to the high incidence of pulled elbow during this age group (4). This result is similar to the result published by Roger Dee, Lawrence (6). The second peak of incidence was among the age group (7–10 yr.) which disagreed with the result published by Mark Brinker (1, 3, 22) which showed that the peak incidence of fractures and dislocations in children was at the age of 12 years.

The female to male ratio of pulled elbow 1.43:1 which goes with the result (17) published by Mark Brinker (3), but against the result published by Roger Dee (6) which showed more frequency in males.

The high incidence of all fractures is among males with a male to female odds ratio 2.4:1, goes with the result published by Mark

Brinker which showed a male to female odds ratio of 2.7:1, but in Australia the incidence in males is 54.8% and in Norway 62.4% similar in U.K. and Canada (3, 12, 15, 10). Summer had the most common seasonal distribution of children's fractures and dislocations which agree with the result published by Mark Brinker (3). This may be due to the length of sunshine hours during summer or due to school holiday.

Conclusion

Fractures and dislocations in children's age is common problem. Distal radius fracture and pulled elbow are the most common fractures and dislocations among children's age groups in Irbid city. Correct prevention may effectively reduce number and severity of the trauma in children's age. Most fractures and dislocations occurred during summer time. The importance of accident prevention programmes in the home is also highlighted to prevent severe children's trauma in our region should focus on road safety, avoidance of falls and prevention of child abuse (protection is right of child upon UNICEF).

Acknowledgement

We thank the staff of Emergency room department and our colleagues in Princess Basma Hospital who help us in this study.

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