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Epidemiology of Fractures Among Patients Attending Azadi Teaching Hospital in Kirkuk City

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Abstract:

Background: Fractures are a common type of injury that result in admission to a hospital. P**atients and Methods:** The study was held in Kirkuk city - Iraq, Azadi Teaching Hospital from the beginning of November 2012 to the end of April 2013. A descriptive case series study with a total of 4156 patients with 5248 confirmed fractures formed the basis of this study. The term type of fracture used in this study signifies either simple (closed) fracture or compound (open) fracture. Associated injury comprised head injury, chest injury, abdominal injury, vascular and nerve injuries. The term multiple fractures were used if more than one fracture has occurred. Hospitalization of a patient meant those who were required to stay in the hospital for more than 24 hours, and others were taken as outpatients. The diagnosis was mainly based on an X-ray. **Results:** The study revealed that multiple fractures are more seen in age group (20 - 40) years, followed by age group less than 20 years was (31.3%), The commonest three fractures encountered in this study were those of radius (21.8%), tibia (18.3%) and ulna (12.5%).so current study determined that highly frequent fractures among age group (20 – 40) year's old patients were tibia fractures (18%), radius fractures (17.4%), and ulna fractures (13.5%). , so frequencies of fractures among males (75%) more than females (25%). As well as fractures were more frequent in an urban area (89.2%). **Conclusion**: the second age group (20-40) years were the more frequent in fracture cases, also Fractures were predominant in males more than females, Persons who lived in urban area had a high frequency of fractures, as well as workers and those with a free job, are more prevalent with fractures, also upper limb fractures were more common than lower limb fractures and axial skeleton fractures. so radius and tibia were the most frequently fractured bones. And the higher frequency of fractures was associated with falls, followed by road traffic accidents. city.

Keywords: Epidemiology; fractures; Azadi Teaching Hospital; Kirkuk

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Introduction

The traditional view of injuries as "accidents" has resulted in historical neglect of this area of public health, despite the fact that injuries affect all populations, regardless of age, sex, income, or geographic region [1]. In 2001, injuries in developing countries accounted for 11% of the world's disease burden, and ranked 11th of all causes of both mortality and morbidity [2]. The understanding of the epidemiology of a disease is one of the methods that help to find out etiology of disease and the factors that may lead to its control. Apart from mortality, an accidental fracture is probably one of the most reliable parameters of danger factors in the lives of children and adults. [3]In the same way, the epidemiology of fractures is of no less importance as accidents in general and road traffic accidents (RTA) in particular remain a major public health problem all over the world. [4]it believed that the changing epidemiology of fractures has not generally been fully appreciated[5]. The studies that have been taken suggest a world incidence of 9.0 – 22.8 / 1000 / year. [6] Most studies are retrospective type and not population based, which makes a comparison between regions is a difficult job. [7]Further, most studies are either age-restricted, focus only on the location of the fracture, or consider specific risk factors such as osteoporosis. [8]Depending on these facts we need to study this problem in detail in our community. There was no research at least in Kirkuk, which consider this problem and its causes may help us to find the measures, which decrease its occurrence. therfore the aim of the current study has been suggested to establish an attempt to analyze the factors contributing to fractures among patients who attending Azadi Teaching Hospital in Kirkuk city.

Patients and Methods:

The study was held in Kirkuk city – Iraq, Azadi Teaching Hospital from the beginning of November 2012 to the end of April 2013.

A descriptive case series study with a total of 4156 patients with 5248 confirmed fractures formed the basis of this study.

Data collection depended on a questionnaire, data were collected age, gender, cause of fracture, type of fracture, its site (upper third, middle third, lower third), side (right, left), associated injuries. The cause of fracture was divided into road traffic accidents which included those caused by two wheelers, four wheelers and those caused to pedestrians. Falls which included slips and falls from height. The assault included sharp blunt weapons, blast weapons, also those caused by sports and industrial machines or agricultural implements. The term type of fracture used in this study signifies either simple (closed) fracture or compound (open) fracture. Associated injury comprised head injury, chest injury, abdominal injury, vascular and nerve injuries. The term multiple fractures were used if more than one fracture has occurred. Hospitalization of a patient meant those who were required to stay in the hospital for more than 24 hours, and others were taken as outpatients. The diagnosis was mainly based on X-ray.

Statistical Analysis: The collected data from the questionnaire and X-ray were primarily tabulated on an EXCEL Microsoft office package on worksheet table according to variables of the questionnaire form then analyzed by SPSS statistical software version 18., by using chi-square test of significance of variation, chi-square was $P \leq 0.05$ as the level of significant(P. a value less than 0.05 was accepted as significance.

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Results:

The study revealed a total number of (4156) patients with (5248) confirmed fractures formed the basis of the study. All patients were grouped into three major groups, less than 20 years, (20 – 40) years and more than 40 years. Of these patients (2944) (70.8%) were males and (1212) (29.2%) were females. As shown in table (1).

Table (1) Distribution of the total number of patients in relation to age and gender

Age	Male		Female		Total	%
	No.	%	No.	%		
< 20	1016	34.5	468	38.6	1484	35.7
20 – 40	1296	44.0	323	26.7	1619	39.0
> 40	632	21.5	421	34.7	1053	25.3
Total	2944	70.8	1212	29.2	4156	100
DF. 2, P. value = 0.0002 , Chi-Sq. = 130.212					H. S.	

The study revealed that multiple fractures are more seen in age group (20 – 40) years, followed by age group less than 20 years was (1642) (31.3%), and least among age group more than 40 years. Table (2)

Table (2) Distribution of the total number of fractures in relation to *age and* gender

Age groups	Male		Female		Total	%
	No.	%	No.	%		
< 20	1257	31.9	385	29.4	1642	31.3
20 – 40	1820	46.2	431	32.9	2251	42.9
> 40	860	21.9	495	37.7	1355	25.8
Total	3937	75	1311	25	5248	100
DF = 2, P. value = 0.0006, Chi Sq. = 139.403					H. S.	

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The commonest three fractures encountered in this study were those of radius 1145 (21.8%), tibia 960 (18.3%) and ulna 654 (12.5%). The study determined that highly frequent fractures among age group (20 – 40) year's old patients were tibia fractures 406 (18%), radius fractures 392 (17.4%), and ulna fractures 305 (13.5%). Highly frequent fractures among age group (less than 20 years) were radius fractures 350 (21.3%), tibia fractures 302 (18.4%), and femur fractures 247 (15%). About highly frequent fractures among age group (above 40 years) were radius fractures 403 (29.7%), tibia fractures 252 (18.6%) and Humerus fractures 130 (9.6%). Table (3)

Table (3) Distribution of fracture site in relation to age of patients

Fracture	< 20		20 – 40		> 40		Total	%
	No.	%	No.	%	No.	%		
Humerus	111	6.8	153	6.8	130	9.6	394	7.5
Radius	350	21.3	392	17.4	403	29.7	1145	21.8
Ulna	245	14.9	305	13.5	104	7.7	654	12.5
Hand bones	53	3.2	230	10.2	63	4.6	346	6.6
Clavicle	43	2.6	65	2.9	55	4.1	163	3.1
Femur	247	15.0	268	11.9	124	9.2	639	12.2
Tibia	302	18.4	406	18.0	252	18.6	960	18.3
Fibula	206	12.5	217	9.6	120	8.9	543	10.3
Foot bones	55	3.3	102	4.5	68	5.0	225	4.3
Patella	21	1.3	42	1.9	12	0.9	75	1.4
Spine	3	0.2	51	2.3	14	1.0	68	1.3
Pelvis	6	0.4	20	0.9	10	0.7	36	0.7
Total	1642	31.3	2251	42.9	1355	25.8	5248	100
DF = 22,		*P. value = 0.00007,*		*Chi Sq. = 272.469*		H. S.		

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The study demonstrated that the frequencies of fractures among males were (3937) (75%), and females were (1311) (25%). This table revealed that tibia fracture was the more frequent fractures among males 790 (20.1%), while fracture of radius was more frequent fractures among females 431 (32.9%).

Table (4) Distribution of fractured bone in relation to gender

Fracture	Male		Female		Total	%
	No.	%	No.	%		
Humerus	288	7.3	106	8.1	394	7.5
Radius	714	18.1	431	32.9	1145	21.8
Ulna	458	11.6	196	15.0	654	12.5
Hand bones	249	6.3	97	7.4	346	6.6
Clavicle	95	2.4	68	5.2	163	3.1
Femur	516	13.1	123	9.4	639	12.2
Tibia	790	20.1	170	13.0	960	18.3
Fibula	476	12.1	67	5.1	543	10.3
Foot bones	203	5.2	22	17	225	4.3
Patella	63	1.6	12	0.9	75	1.4
Spine	54	1.4	14	1.1	68	1.3
Pelvis	31	0.8	5	0.4	36	0.7
Total	3937	75	1311	25	5248	100
DF = 11,	*P. value = 0.00021,*		*Chi Sq. = 252.135*		H. S.	

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This table demonstrated the frequency that fractures were more frequent in urban area 4680 (89.2%). Regarding more frequent fracture was of a radius in both urban area and rural area; (1034) (22.1%) and (111) (19.5%) respectively.

Table (5) Distribution of fractured bone in *relation to the residence*.

Fracture	Rural		Urban		Total	%
	No.	%	No.	%		
Humerus	61	10.7	333	7.1	394	7.5
Radius	111	19.5	1034	22.1	1145	21.8
Ulna	76	13.4	578	12.4	654	12.5
Hand bones	39	6.9	307	6.6	346	6.6
Clavicle	22	3.9	141	3.0	163	3.1
Femur	85	15.0	554	11.8	639	12.2
Tibia	87	15.3	873	18.7	960	18.3
Fibula	42	7.4	501	10.7	543	10.3
Foot bones	17	3.0	208	4.4	225	4.3
Patella	15	2.6	60	1.3	75	1.4
Spine	10	1.8	58	1.2	68	1.3
Pelvis	3	0.5	33	0.7	36	0.7
Total	568	10.8	4680	89.2	5248	100
DF = 11,	*P. value = 0.0002,*		*Chi Sq. = 34.927*		H. S.	

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This table demonstrated that associated injuries encountered in 347 (6.6%) of the cases of fractures.

Table (6) Frequency of associated injuries in relation *to fractures*

Fracture	Total	Associated injuries	%
Humerus	394	44	0.83
Radius	1145	46	0.87
Ulna	654	53	1.009
Hand bones	346	14	0.26
Clavicle	163	2	0.03
Femur	639	32	0.006
Tibia	960	68	1.29
Fibula	543	71	1.35
Foot bones	225	3	0.05
Patella	75	4	0.07
Spine	68	4	0.07
Pelvis	36	6	0.11
Total	5248	347	6.6

Discussion:

For more than half a century, the occurrence of fractures with specific age- and gender-patterns have been recognized. [2]

Unfortunately, traditional sources of information about the descriptive epidemiology of diseases, injuries and risk factors are generally incomplete, fragmented and of uncertain reliability and comparability. However, the epidemiology of any fracture is bound to change with societal and regional differences that may occur over time [9,10,11]

The comparative analyses of the true public health importance of various conditions and risk factors have impeded due to lack of a standardized measurement framework to permit comparisons across diseases and injuries, as well as risk factors, and failure to systematically evaluate data quality [9,10]

Poor appreciation for the impact of major conditions and hazards on population health, and as a result of it, often lead to a lack of public health investment [9], For musculoskeletal injuries, and this also recognized, in both high- income and low-income countries, while the latter experience a far greater disease burden from musculoskeletal injuries [10]

This study revealed that the most frequent fractures were among age group (20 – 40) years old patient (42.9%), this agreed with Jha N. et al. in their study in South India who found that more than 53% of patients were among the age group between (20 – 40) years. [12]

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There are another studies agreed with the result of the current study, in Owerri (Nigeria) the fractures were more frequent in male than females, also agreed with study in Britain on fractures in childhood, in which fractures were more common in boys than girls [13,14]

The current study –regarding gender, determined that males (75%) were more frequently fractured than females (25%), this result disagreed with a study in Norway which determined that (46%) of fractures in males and (59%) in females, also disagreed with another study which should about (30%) of fractures in men, (66%) of fractures in women. [4]

Regarding age and gender; the study determined that a young adult male (34.5%) was the person most at risk of a fracture, this agreed with Shaheen MAE et al. in Saudi Arabia and Rakesh Sharma in India. This shows that the people of the most active and productive age group are involving in the trauma, which adds a serious economic loss to the community. [5]

Regarding residency; the current study demonstrated that fractures were more frequent in the urban area (89.2%), this disagreed with a study in India that showed that the frequency of fractures was almost equal in Urban and Rural areas. [15]

Regarding mode of injury; Our study revealed that falls were the major cause of fracture of the total, this disagreed with Swarnker M. et al. and Okare I.O. et al. who reported that RTA was the major cause of fractures, while the result agreed with E. bong who carried out a study in west Nigeria, he reported that most of the fractures have resulted from falls. [12,15]

This study revealed that the higher rate of fractures caused by road traffic accidents was the second cause of fractures (31.1%), and the most involved bones were tibia (37.8%) and fibula (22.2%), this agreed with a study in Nigeria. This may be due to a tremendous increase in the number of vehicles plying the roads, poorly maintained cars and roads and the introduction of commercial motorcycle transport. [13]

Conclusions: The present study concluded the followings:

1. In the second age group (20-40) years were the more frequent in fracture cases, also Fractures were predominant in males (75%), while in females (25%).
2. Persons who lived in urban areas had a high frequency of fractures, while less frequency was among persons who lived in a rural area. as well as workers and those with a free job are more prevalent with fractures, so upper limb fractures were more common than lower limb fractures and axial skeleton fractures.so radius and tibia were the most frequently fractured bones. And the higher frequency of fractures was associated with falls, followed by road traffic accidents.

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وبائيات الكسور بين مرضى مستشفى آزادي التعليمي في مدينة كركوك

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الخلاصة :

الكسور هي نوع شائع من الإصابات التي تؤدي إلى دخول المستشفى. المرضى وطرق العمل: الدراسة التي أجريت في مدينة كركوك - العراق ، مستشفى آزادي التعليمي من بداية تشرين الثاني (نوفمبر) 2012 إلى نهاية نيسان (أبريل) 2013. حيث مثلت الدراسة الوصفية لـ 4156 مريضًا مع 5248 حالة لديهم كسور مؤكدًة والتي هي أساس هذه الدراسة . حيث يشير مصطلح نوع الكسر المستخدم في هذه الدراسة إلى الكسر البسيط (المغلق) أو الكسر المركب (المفتوح). الإصابات المصاحبة شملت إصابة في الرأس ,إصابة في الصدر , إصابة بالبطن وإصابات في الأوعية الدموية والأعصاب. تم استخدام مصطلح الكسور المتعددة في حالة حدوث أكثر من كسر واحد. وبشير مصطلح مكوث المريض في المستشفى أولئك الذين احتاجوا إلى البقاء في المستشفى لأكثر من 24 ساعة ، والآخرين هم الذين تم أخذهم في العيادات الخارجية. وقد اعتمد التشخيص بشكل أساسي على الأشعة السينية. النتائج: أوضحت الدراسة أن الكسور المتعددة كانت الاكثر في الفئة العمرية (20-40) سنة، تليها الفئة العمرية (الأقل من 20) سنة وبنسبة (31.3٪) ،وقد كانت كثر ثلاثة كسور شيوعًا في هذه الدراسة هي كسور الكعبرة وبنسبة (21.8٪) ثم الساق (18.3٪) يليها عظم الزند (12.5٪) ، وقد بينت الدراسة الحالية أن الكسور الأكثر شيوعًا بين المرضى من الفئة العمرية (20-40) سنة كانت في الساق (18٪) ، كسور نصف القطر وكسور الزند (17.4٪) ، كذلك فإن نسبة الكسور بين الذكور (75٪) أكثر مما هو في الإناث (25٪).

الاستنتاج: كانت الفئة العمرية الثانية (20-40) سنة هي الأكثر تكرارا في حالات الكسور، كما كانت الكسور عند الذكور أكثر من الإناث، وكانت الكسور اكثر انتشارا لدى الأشخاص الذين يعيشون في المدينة والعاملين، الحضرية لديهم نسبة عالية من الكسور ، وكذلك العمال وذويهم , كما كانت كسور الأطراف العلوية أكثر شيوعًا من كسور الأطراف السفلية وكسور الهيكل العظمي المحوري, لذلك كانت كسور نصف القطر والساق هما أكثر انواع العظام المكسورة. كما ارتبط ارتفاع معدل الكسور بالسقوط، تليها حوادث المرور.

الكلمات المفتاحية: علم الأوبئة؛ كسور مستشفى آزادي التعليمي؛ كركوك