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# TRAUMATIC PELVIC FRACTURES HOSPITALIZED IN KASR AL-AINY HOSPITAL IN 2018: A RETROSPECTIVE STUDY

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## ABSTRACT

Major pelvic fractures are predominantly observed when there is a high-energy transfer to the patient such as following road traffic collision, pedestrian accident, fall from height, or crush injury. Less serious pelvic fractures may occur with low-energy transfer events, particularly in the elderly. **Objectives:** The aim of the current study is to statistically assess the prevalence, common causes, management and outcome of pelvic fracture cases admitted to Kasr Al-Ainy hospital through the year 2018. **Subjects and methods:** The data presented in this study were obtained from the bureau of statistics at Kasr Al-Ainy hospital. One hundred ninety six cases with traumatic pelvic fractures were admitted to Kasr Al-Ainy hospital during the one year period study from January 2018 to December 2018. **Results:** the incidence of traumatic pelvic fractures in the present study was higher in males, urban areas and day time. The age group 21-40 was associated with a higher percentage of traumatic pelvic fractures was recorded and a mean age was 35 years. Road traffic accidents were the commonest cause followed by fall from height. A higher incidence of multiple pelvic fractures and the higher percentage of cases was treated surgically. Improvement was the major outcome while death was associated with the old age group above 61 years. **Conclusion and recommendations:** there is a need to decrease the number of road traffic accidents and greater precautions should be taken against the risks of fall from height. Old age group should be managed with special care.

**KEYWORDS:** Pelvic fractures, Kasr Al-Ainy hospital, Road traffic accidents, Fall from height.

## INTRODUCTION

Pelvic ring fractures are considered uncommon fractures since the incidence is ranging from 3% to 8% of all patients subjected to trauma. Furthermore, fracture pelvis accounts for 1 – 3% of all

skeletal fractures and constitutes 2% of orthopedic cases admitted to hospitals (Pohlemann et al., 1996; and Gustavo Parreira et al., 2000).

However, pelvic ring fractures are associated with a high mortality rate that

varies between 4% up to 28%. The associated injuries with traumatic pelvic fractures mainly and not the fracture itself account for most of the deaths in these patients (**Demetriades et al., 2012; Hauschild et al., 2008; and Holstein et al., 2012**). Fracture pelvis can result in excessive hemorrhage or shock due to associated punctured wound of the internal viscera such as the bladder or the bowel (**Walker, 2011**).

Pelvic fractures are usually the result of a high energy trauma and are associated with other injuries in about 90% of cases (**Dalal et al., 1989; and Gustavo Parreira et al., 2000**). Road traffic accidents are responsible for about 80% of cases of pelvic fractures and pedestrians are more commonly involved than car occupants (**Cordts Filho Rde et al., 2011; and Ganssen et al., 2012**).

Fall from height is the next common cause and is responsible for about 16% of all pelvic fractures (**Petaros et al., 2013; and Nasef et al., 2018**). Less commonly fracture pelvis is due to machinery compression or direct hit to the pelvis (**Bottlang et al., 2002; and Stover et al., 2017**).

Pelvic fractures are classified according to either Tile classification or Young-Burgess classification. Tile classification is based on the integrity of the posterior sacroiliac complex, pelvic fractures range in severity from low energy injuries to life threatening unstable fractures. On the other hand, Young-Burgess classification is based on the mechanism of injury (**Koo et al., 2008**).

According to the site of a pelvic bone fracture, pelvic fractures are divided into: single fractures i.e.

individual pelvic bone fracture and complex fracture i.e. multiple pelvic bone fractures. Diagnosis of pelvic fracture is usually made on the basis of history, clinical features and special investigations usually including X-ray and CT (**Hirvensalo et al., 2007**).

As in many cases of skeletal fractures, traumatic pelvic fractures have been associated with several medico-legal implications such as pursuit for compensations, potential risk of sustained disabilities and claims for malpractice (**Harris et al., 2008**).

**AIM OF THE STUDY** is to statistically assess the prevalence, common causes, management and outcome of pelvic fracture cases admitted to Kasr Al-Ainy hospital through the year 2018.

## **SUBJECTS & METHODS**

The current work is a retrospective study of cases admitted to Kasr Al-Ainy hospital during the period from 1st of January to 31st of December 2018 with a history of traumatic pelvic fractures. After obtaining an official approval from the bureau of statistic at Kasr Al-Ainy hospital, data were collected through the electronic filing system. The data collected did not include the name of the patient to ensure and prevent violation of privacy.

One hundred ninety six cases of traumatic pelvic fractures were recorded during the period of the study and the following parameters were studied:

### 1. Demographic criteria:

- Age: was categorized into 4 groups: <20 years, 21-40 years, 41-60, and >61 years.
  - Sex: male or female.
  - Residence: urban or rural areas.
2. Time of injury: day (a.m.) or night (p.m.).
  3. Type of fracture: single pelvic fracture or multiple pelvic fractures.
  4. Cause of fracture: car accident, motor cycle accident, fall from height, hit by solid object, or unknown.
  5. Management: whether conservative or surgical.
  6. Outcome: improvement, discharge by request, escape, and death.

Inclusion criteria included all traumatic pelvic fractures with or without other injuries in the body, all age groups, and both sexes. While exclusion criteria included pelvic fractures due to pathologic causes; and pelvic fractures received at emergency department and referred to other hospitals without admission.

#### Statistical analysis:

The collected data were tabulated and analyzed using SPSS version 16 soft ware (SPSS Inc, Chicago, ILL Company). Categorical data were presented as number and percentages while quantitative data were expressed as mean  $\pm$  standard deviation. Chi square ( $X^2$ ) test, Fisher's exact test were used as tests of significance. The accepted level of significance in this work was stated at

0.05 (P <0.05 was considered significant).

## RESULTS

As regards the demographic results, the incidence of pelvic fractures was highest in the age group 21-40 years accounting for 36.2% of the cases followed by both the age groups <20 year and 41-60 years being 27.6% and 26% respectively. On the other hand, the incidence was lowest in the age group >61 years which accounted for only 10.2% of cases. The mean age  $\pm$  SD for all cases was  $35.67 \pm 17.875$  (table 1). While the distribution of the hospitalized cases of fracture pelvis showed a greater prevalence among males (61.2%) than females (38.8%) as shown in table 2. Furthermore, pelvic fractures in the current study were higher in urban (58.2%) than in rural areas (table 3).

Table 4 showed that the incidence of pelvic fractures in the present study was higher during the day (55.1%) than in the night (44.9%). Regarding the cause of pelvic fractures, car accidents accounted for more than half of the cases (54.6%) followed by motorcycle accidents (19.4%). Fall from height represented the third common cause of pelvic fractures (17.3%) while hit by solid object was the least recorded cause (3.6%). It should be noted that it was unknown (not registered) in 5.1% of cases (table 5).

In the current study, multiple pelvic fractures were more common than single pelvic fractures and represented 55.1% of cases studied, while single pelvic fractures on the other hand represented 44.9% of cases (table 6). Regarding the management of the studied cases, surgical procedures accounted for 54.1% while conservative treatment accounted for the lesser portion being 45.9% (table 7). As for the outcome, improvement constituted the most common outcome and represented 87.8%, while escape from the hospital accounted for 5.6%. Discharge on the request of the patient was recorded in 4.6% of the hospitalized cases, while death was recorded only in 2% of cases (table 8).

Correlation between the sex and different age groups in the current study showed that the highest percentage of males with fracture pelvis was within the age group 21-40 year (38.3%) followed by the age group 41-60 years (33.3%) and <20 years (20%). While males within the age group >61 years accounted only for 8.3%. On the other hand, females within the age group <20 years formed the higher portion of fracture pelvis (39.5%). The age groups 21-40 years and 41-60 years accounted for 32.9% and 14.5% respectively for pelvic fractures in females. Similar to males, age group >61 years accounted for the least percentage being 13.2%. The probability value was significant ( $P=0.003$ ) (table 9).

As for the correlation between the sex and the type of pelvic fracture in the current study, it was shown that in males both single pelvic fracture (49.2%) and multiple pelvic fractures (50.8%) were almost equally distributed. While in females, multiple pelvic fractures were higher (61.8%) than single pelvic fracture (38.2%). However, the probability value was insignificant ( $P>0.05$ ) (table 10).

The correlation between the different age groups and the fracture type showed that the distribution of single pelvic fractures and multiple pelvic fractures were higher in the age group 21-40 years being 42% and 31.5% respectively. While the lowest distribution was in the age group >61 years and both types of fractures were equally distributed within this age group (10.2%). The probability value was not significant ( $P>0.05$ ) (table 11).

On the other hand, the correlation between the cause of pelvic fracture and the different age groups showed that car accidents and motor cycle accidents represented the commonest causes of pelvic fracture in the age group 21-40 years being 37.4% & 55.3%. While both car accidents and motor cycle accidents were uncommon causes of fracture pelvis in the age group >61 years being only 10% and 0% respectively. On the other hand, fall from height as a cause of fracture pelvis was most common in the age group <20 years (58.8%) followed by the age group 21-40 years (17.6%). Moreover, fall

from height accounted for the smallest percentage in the age group >61 years being only 8.8%. Hit by solid object was considered only in both the age groups <20 years and 21-40 years (57.1% and 42.9% respectively). The probability value was highly significant ( $P=0.000$ ) (table 12).

As for the correlation between the cause of pelvic fracture and the sex, both car accidents and motor cycle accidents were significantly higher in males and the percentage was 56.1% and 89.5% respectively. Fall from height as a cause of fracture pelvis was equally distributed between both sexes, while hit by a solid object was a commoner cause of fracture pelvis in females (60%) than males (40%). The probability value was found significant ( $P=0.002$ ) (table 13).

Regarding the correlation between the fracture type and the cause of pelvic fracture, car accidents were more common associated with multiple pelvic fractures (67.3%) while on the opposite side motor cycle accidents were mainly associated with single pelvic fractures (68.4%). Fall from height was associated with a higher incidence of multiple pelvic fractures (52.9%) than single pelvic fractures (47.1%). Lastly, hit by a solid object was mainly associated with single pelvic fracture (85.7%). The probability value was found highly significant ( $P=0.001$ ) (table 14).

Correlation between the management and the fracture type

showed that single pelvic fractures were managed mainly conservatively (93.3%) while multiple pelvic fractures were managed mainly surgically (96.2%). The probability values were found highly significant ( $P=0.000$ ) as shown in table 15.

On the other hand, the correlation between the outcome and the different age groups showed that improvement was the most common outcome in the age groups 21-40 years, <20 years and 41-60 years being 37.2%, 27.3% and 26.7% respectively. On the other hand, death was associated only (100%) with the age group >61 years. Discharge on request as an outcome was common with the both the age groups 21-40 years and 41-60 years and the percentage was 55.6% and 33.3% respectively. Escape from hospitalization was recorded mainly with the age group <20 years (54.5%) and it was equally recorded in both age groups 21-40 years and 41-60 years (18.2%). The probability value was highly significant ( $P=0.000$ ) (table 16).

Correlation between the fracture type and the outcome showed no significant difference ( $P>0.05$ ) since the improvement in cases of single pelvic fracture and cases of multiple pelvic fractures was 86.4% and 88.9% respectively. On the other hand, death percentage was 1.1% in cases of single pelvic fracture and 2.8% in cases of multiple pelvic fractures. Discharge on request was 3.4% in single pelvic fracture and 5.6% in multiple pelvic fractures.

Lastly, escape from the hospital was higher in single pelvic fracture being

9.1% compared to 2.8% for multiple pelvic fractures (table 17).

**Table 1:** Distribution of cases of traumatic pelvic fractures among different age groups

Pelvic F Age groups in years	Number of cases	Percentage	Mean $\pm$ SD (years)
<20	54	27.6%	35.67 $\pm$ 17.875
21-40	71	36.2%	
41-60	51	26.0%	
>61	20	10.2%	
Total	196	100.0%	

**Table 2:** Distribution of cases of traumatic pelvic fractures according to the sex

Pelvic F Sex	Number of cases	Percentage
Male	120	61.2%
Female	76	38.8%
Total	196	100.0%

**Table 3:** Distribution of cases of traumatic pelvic fractures according to the residence

Pelvic F Residence	Number of cases	Percentage
Rural	82	41.8%
Urban	114	58.2%
Total	196	100.0%

**Table 4:** Distribution of cases of traumatic pelvic fractures according to time of incidence

Pelvic F Time	Number of cases	Percentage
am	108	55.1%
pm	88	44.9%
Total	196	100.0%

**Table 5:** Distribution of cases of traumatic pelvic fractures according to the cause

Pelvic F Cause	Number of cases	Percentage
Unknown	10	5.1%
Solid object	7	3.6%
Fall	34	17.3%
Motor cycle	38	19.4%
Car accident	107	54.6%
Total	196	100.0%

**Table 6:** Distribution of cases of traumatic pelvic fractures according to the fracture type

Pelvic F Fracture type	Number of cases	Percentage
Single pelvic fracture	88	44.9%
Multiple pelvic fractures	108	55.1%
Total	196	100.0%

**Table 7:** Distribution of cases of traumatic pelvic fractures according to the management

Pelvic F Management	Number of cases	Percentage
Conservative	90	45.9%
Surgical	106	54.1%
Total	196	100.0%

**Table 8:** Distribution of cases of traumatic pelvic fractures according to the outcome

Pelvic F Outcome	Number of cases	Percentage
Death	4	2.0%
Improvement	172	87.8%
Discharge on request	9	4.6%
Escape	11	5.6%
Total	196	100.0%

**Table 9:** Correlation between the sex and different age groups among cases of traumatic pelvic fractures

		Sex				Total	
		Male		Female			
		no	%	no	%	no	%
Age groups (years)	<20	24	20.0%	30	39.5%	54	27.6%
	21-40	46	38.3%	25	32.9%	71	36.2%
	41-60	40	33.3%	11	14.5%	51	26.0%
	>61	10	8.3%	10	13.2%	20	10.2%
Total		120	100.0%	76	100.0%	196	100.0%
X <sup>2</sup>		14.2					
P value		.003*					

**Table 10:** Correlation between the sex and the fracture type among cases of traumatic pelvic fractures

		Sex				Total	
		Male		Female			
		no	%	no	%	no	%
Fracture type	Single fracture	59	49.2%	29	38.2%	88	44.9%
	Multiple fractures	61	50.8%	47	61.8%	108	55.1%
Total		120	100.0%	76	100.0%	196	100.0%
X <sup>2</sup>		2.2					
P value		>0.05					

**Table 11:** Correlation between the different age groups and the fracture type among cases of traumatic pelvic fractures

		Fracture type				Total	
		Single pelvic fracture		Multiple pelvic fractures			
		no	%	no	%	no	%
Age groups (years)	<20	22	25.0%	32	29.6%	54	27.6%
	21-40	37	42.0%	34	31.5%	71	36.2%
	41-60	20	22.7%	31	28.7%	51	26.0%
	>61	9	10.2%	11	10.2%	20	10.2%
Total		88	100.0%	108	100.0%	196	100.0%
X <sup>2</sup>		2.5					
P value		>0.05					



**Table 12:** Correlation between the cause and the different age groups type among cases of traumatic pelvic fractures

		Cause										Total	
		Unknown		Solid object		Fall		Motor cycle		Car accident			
		no	%	no	%	no	%	no	%	no	%	no	%
Age groups (years)	<20	0	0.0%	4	57.1%	20	58.8%	9	23.7%	21	19.6%	54	27.6%
	21-40	1	10.0%	3	42.9%	6	17.6%	21	55.3%	40	37.4%	71	36.2%
	41-60	2	20.0%	0	0.0%	5	14.7%	8	21.1%	36	33.6%	51	26.0%
	>61	7	70.0%	0	0.0%	3	8.8%	0	0.0%	10	9.3%	20	10.2%
Total		10	100.0%	7	100.0%	34	100.0%	38	100.0%	107	100.0%	196	100.0%
Fisher exact		74.9											
P value		.000*											

**Table 13:** Correlation between the cause and the sex among cases of traumatic pelvic fractures

		Cause										Total	
		Unknown		Solid object		Fall		Motor cycle		Car accident			
		no	%	no	%	no	%	no	%	no	%	no	%
Sex	M	6	60.0%	3	42.9%	17	50.0%	34	89.5%	60	56.1%	120	61.2%
	F	4	40.0%	4	57.1%	17	50.0%	4	10.5%	47	43.9%	76	38.8%
Total		10	100.0%	7	100.0%	34	100.0%	38	100.0%	107	100.0%	196	100.0%
Fisher exact		16.8											
P value		.002*											

**Table 14:** Correlation between the fracture type and the cause among cases of traumatic pelvic fractures

		Fracture type				Total	
		Single pelvic fracture		Multiple pelvic fractures			
		no	%	no	%	no	%
Cause	Unknown	5	50.0%	5	50.0%	10	100.0%
	solid object	6	85.7%	1	14.3%	7	100.0%
	Fall	16	47.1%	18	52.9%	34	100.0%
	Motor cycle	26	68.4%	12	31.6%	38	100.0%
	Car accident	35	32.7%	72	67.3%	107	100.0%
Total		88	44.9%	108	55.1%	196	100.0%
X <sup>2</sup>		19.8					
P value		.001*					

**Table 15:** Correlation between the management and the fracture type among cases of traumatic pelvic fractures

		Management				Total	
		Conservative		Surgical			
		no	%	no	%	no	%
Fracture type	Single pelvic fracture	84	93.3%	4	3.8%	88	44.9%
	Multiple pelvic fractures	6	6.7%	102	96.2%	108	55.1%
Total		90	100.0%	106	100.0%	196	100.0%
X <sup>2</sup>		157.8					
P value		.000*					

**Table 16:** Correlation between the outcome and the different age groups among cases of traumatic pelvic fractures

		Outcome								Total	
		Death		Improvement		Discharge on request		Escape			
		no	%	no	%	no	%	no	%	no	%
Age groups (years)	<20	0	0.0%	47	27.3%	1	11.1%	6	54.5%	54	27.6%
	21-40	0	0.0%	64	37.2%	5	55.6%	2	18.2%	71	36.2%
	41-60	0	0.0%	46	26.7%	3	33.3%	2	18.2%	51	26.0%
	>61	4	100.0%	15	8.7%	0	0.0%	1	9.1%	20	10.2%
Total		4	100.0%	172	100.0%	9	100.0%	11	100.0%	196	100.0%
Fisher exact		42.7									
P value		.000*									

**Table 17:** Correlation between the fracture type and the outcome among cases of traumatic pelvic fractures

		Fracture type				Total	
		Single pelvic fracture		Multiple pelvic fractures			
		no	%	no	%	no	%
outcome	Death	1	1.1%	3	2.8%	4	2.0%
	Improvement	76	86.4%	96	88.9%	172	87.8%
	Discharge on request	3	3.4%	6	5.6%	9	4.6%
	Escape	8	9.1%	3	2.8%	11	5.6%
Total		88	100.0%	108	100.0%	196	100.0%
X <sup>2</sup>		4.6					
P value		>0.05					

## DISCUSSION

Fractures of the pelvic ring have been reported to account for about 8% of all skeletal injuries and they are commonly associated with high energy trauma, most commonly car accidents, motor cycle accidents and

falls from a height (Dalal et al., 1989, Gänslen et al., 1996; and Gustavo Parreira et al., 2000).

The incidence of pelvic fracture in the few last decades seems to be increasing which can be attributed to the increases in the number of high-speed motor vehicle accidents. It was

observed that among multiply injured patients with blunt trauma the incidence of pelvic injury was approximately 20% (**Amjad et al., 2014; and Bakhshayesh et al., 2018**).

In the current study, the middle age group (21-40 years and 41-60 years) accounted for about 60% of traumatic pelvic fractures and the incidence in the old age group (> 60 years) was the lowest. The mean age  $\pm$  SD of the studied cases was  $35.67 \pm 17.875$  years. This can be explained by the fact that the middle age group is exposed to increased risk of road traffic accidents and also child supervision is documented as an important factor of injury prevention (**Valerio et al., 2010; and Pressley et al., 2011**). The current results are in concordance with the study conducted by **Bharti, et al. (2014)** which showed that the most affected age group was those between 20 and 59 years. Similar results were recorded by **Durkee et al. (2006)** who found that the middle age group was associated with the highest incidence of traumatic pelvic fractures and the mean age was 45.9 years. On the other hand, **Korovessis et al. (2000)** stated that pelvic fractures occur in bimodal pattern and the peak was in the age group 20-40 and old age group over 65 years.

The incidence of traumatic pelvic fractures in the present study was higher in males to females and the ratio was approximately 3:2. This can be attributed to car and motor cycle

accidents being more common in males due to higher speed, substance abuse and being more commonly the driver especially of motor cycles (**WHO, 2013**). Similar results were recorded by **Gruen et al. (2009)** and the ratio of pelvic fracture between males and females was 2.1: 1. Furthermore, **Furey et al. (2009)** stated in their study that the percentage of pelvic fractures was 70% in males against 30% in females. **Harvie et al. (2008)** recorded that traumatic pelvic fractures were more prevalent in males but the incidence was 88.3% compared to 11.7% for females. This incidence is much greater than that in the present study.

Similarly, the hospitalized cases of traumatic pelvic fractures in the current study were more in urban than in rural areas and the ratio was approximately 3:2. This can be explained on the basis of the higher speed, high volume of traffic and the high prevalence of public transportation vehicles, pedestrian & cyclist persons. In addition, the Kasr El-Ainy hospital is located in an urban area. **Gustavo Parreira et al., 2000** also concluded that pelvic fractures were more common in urban than rural areas. Similar result was recorded by a study carried by **Dente et al. (2005)** which showed that urban areas were associated with a higher incidence of pelvic fractures than rural areas. On the opposite side, **O'Sullivan et al. (2005)** showed that the incidence of traumatic pelvic fractures was more common in rural

area compared to urban areas and the ratio was 3:2. In addition, **Brown et al. (2000)** reported that motor vehicle crashes in rural areas were still significantly more fatal than in urban areas.

The time of occurrence the traumatic pelvic fracture in this study showed that the higher incidence of pelvic fractures was during the day time i.e. 55.1%. This can be explained by the fact that rush hours are mainly in the morning with a higher incidence of motor vehicle and motor cycle crashes. This was in agreement with **Blackmore et al. (2003)** who found that most of pelvic fractures occurred during day time (71.6%). In addition, **Osterhoff et al. (2014)** in their study stated that majority of pelvic fracture cases occurred during the morning.

In the present study, the most common cause of traumatic pelvic fractures was road traffic accidents (car and motor cycle accidents) and accounted for 74% of cases while fall from height came next (17.3%) and lastly hit by solid object (3.6%). This can be attributed to the high energy impact associated with road traffic accidents (**Walker et al., 2011; and Hao et al., 2016**). In agreement with the current results, **Walker et al., 2011** stated that traffic accidents due to both car and motor cycle accidents accounted for 63% of cases of traumatic pelvic fractures while fall from height accounted for 20% of cases. Furthermore, **Hao et al., 2016**

showed that car and motor cycle accidents were primary causes of fracture pelvis and the rate was 53.3% & 13.3% respectively, while fall from height accounted for 13.3%.

In the current study, the incidence of multiple pelvic fractures was more common than single pelvic fracture. The present result can be attributed to the fact that multiple pelvic fractures are associated more commonly with the high energy impact which is mainly associated with road traffic accidents (**Walker et al., 2011**). This was in agreement with **Pennal et al., 2012** who stated that pelvic fracture was a part of multiple trauma and in 58 % of cases there was a sacroiliac widening while 15 % presented as a single fracture site. On the other hand, **Lee & Porter, 2007** showed that multiple pelvic fractures accounted only for 33.8% of cases of fracture pelvis in their study. In addition, **Abulfotooh, 1983** stated that single fracture of the pelvis with or without disruption of pelvic ring constituted the majority of traumatic pelvic fractures while multiple fractures of the pelvis constituted 10.8%.

The management of traumatic pelvic fractures in the present study showed that surgical interference was more (54.1%) than conservative treatment (44.9%) since car accidents was a major cause of unstable multiple pelvic fractures. This is in agreement with **Keykhosro & Mahtab (2013)** who described

surgical treatment by open reduction and internal fixation an efficient management for unstable pelvic fractures. On the other hand, **Eberbach et al., 2017** stated in their study that conservative treatment showed a higher success rate over surgical treatment in cases of traumatic pelvic fractures.

Improvement was the most common outcome (87.8%) while death accounted for only 2% of cases with traumatic pelvic fractures. In agreement with the present study, **Hak et al. (2009)** showed that improvement and excellent clinical outcomes were achieved in 83%, 11.3% showed no improvement and in 5.7% death was the result. Similarly, **Papadopoulos et al. (2006)** stated that the outcome was excellent in 62.4%, good in 28.5% and death in 9.1%. On the other hand, the rate of death from traumatic pelvic fracture was very high in the study carried by **Vigdorchik et al. (2012)** and it was 32%.

In the present study, significant correlation was found between the sex and different age groups. Traumatic pelvic fractures in males were highest in the age group 21-40 years (38.3%) followed by the age group 41-60 year (33.3%), while in females it was highest in the age group <20 year (39.5%) followed by the age group 21-40 years (32.9%). In agreement with the present results, **Papadopoulos et al., 2006** found that male patients with pelvic fractures

were 56.3% between 20-40 years, and 28.4% were >40 years, while in females it was 68% in age group >40 years and 22.7% between age group 20-40 years. However, the study conducted by **Tyson et al. (2014)** found that 50% of cases with pelvic fractures were males between 20-40 years compared to females 61.1% in the same age group.

On the other hand, the correlation between the sex and the type of pelvic fracture in the current study was insignificant, and both types of traumatic fracture pelvis were almost equally distributed in males while multiple pelvic fractures were higher than single pelvic fracture in females. Similarly, **Sharma et al. (2008)** in their study showed that 50% of male cases had multiple pelvic fractures.

Likewise, the correlation between the different age groups and the fracture type was insignificant. The distribution of single pelvic fracture and multiple pelvic fractures were higher in the age group 21-40 years and minimum in the age group > 60 years. In concordance with the present study, **Morozumi et al. (2010)** described similar results and the peak of multiple pelvic fractures was in the age group 25-45 years. In contrast, **Sathy et al. (2009)** showed that 38.4% of cases <20 years had multiple pelvic fractures and 30% of cases were between 20-40 years. In addition, **Korovessis et al. (2000)** stated that the peak of pelvic fractures

occurred in the age group 20-40 years and age group over 65 years.

In the current study, there was a highly significant correlation between the cause of pelvic fracture and the different age groups. The age group 21-40 years was associated with higher incidence of traumatic pelvic fractures (36.2%) and road traffic accidents (car and motor cycle accidents) were the most common cause followed by fall from height then hit by solid object. This was in agreement with the studies carried by **Suzuki et al. (2007)** and **Hao et al. (2016)** that described that traffic accidents accounted for about two thirds of cases of pelvic fractures followed by fall from height. In addition, **Kreig et al. (2005)** showed that the most frequent cause of pelvic injury was a road traffic accident.

A significant correlation was found between the cause of pelvic fracture and the sex. Both car accidents and motor cycle accidents were significantly higher in males while fall from height was equally distributed between both sexes. In agreement with the present study, **Mauffrey (2014)** showed that 44% of cases of pelvic fracture in males were due to car accident and 30% were due to fall from height. On the other hand, car accidents accounted for 40% in females followed by fall from height (38%).

In the current study, the correlation between the fracture type

and the cause of pelvic fracture was highly significant. Car accidents and fall from height were associated more commonly with multiple pelvic fractures. On the other hand, motor cycle accidents were associated mainly with single pelvic fracture. In concordance with the present results, **Martin & Tomas (2011)** in their study showed that multiple pelvic ring fractures were the result of high-energy mechanisms as car accidents and fall from height.

In the present study, the correlation between the management and the fracture type was highly significant and showed that the management was mainly conservative in single pelvic fracture and surgical in multiple pelvic fractures. This was in agreement with **Keykhosro & Mahtab (2013)** who preferred surgical treatment in management of unstable multiple pelvic fractures.

The correlation between the outcome and the different age groups was highly significant. Improvement was the most common outcome in all the age groups being 37.2%, 27.3% and 26.7% in the age groups 21-40 years, <20 years and 41-60 years. On the other hand, death was associated only with the age group >61 years. Similarly, **Papadopoulos et al. (2006)** showed that improvement of traumatic pelvic fractures constituted the major outcome in most of the age groups in their study. In addition, **Bakhshavesh et al. (2018)** in a

recent study found that the rate of mortality was higher mainly in old age group (above 60 years) in cases of pelvic fracture associated with high energy trauma. In contrast, the study conducted by **Brandes & Borrelli (2011)** showed no significant difference in the outcome of traumatic pelvic fractures between different age groups included in their study.

### RECOMMENDATIONS

- Increasing the efforts and raising the awareness against road traffic accidents and fall from height since both are the main causes of traumatic pelvic fracture especially in the middle age group.

- Special care should be provided to old persons above 60 years with fracture pelvis since all the deaths in the current study were in this age group.

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## الملخص العربي

دراسه رجعيه لكسور الحوض الاصابيه بمستشفى القصر العيني خلال عام ٢٠١٨

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الكسر هو انحلال لاستمرارية العظام مع او بدون تشريد عظمي ويرافقه فى كثير من الاحيان تلف فى الأنسجة الناعمة بدرجات متفاوتة. ووفقا لموقع كسور عظم الحوض فانها تنقسم إلى كسور الحوض الفردية (كسور فدي لعظم الحوض)، وكسور الحوض المعقدة (كسر متعدد لعظم الحوض). و من الاسباب الشائعة لكسور الحوض الإصابية الاصابات عالية الطاقة مثل حوادث السيارات، حوادث الدراجات النارية أو السقوط من إرتفاع كبير. يتم التشخيص علي اساس من التاريخ الطبي، الفحوصات الخاصة عادة ما تشمل الأشعة السينية والأشعة المقطعية. الهدف من هذا العمل هو دراسة كسور الحوض الإصابية التي تم دخولها إلى مستشفى القصر العيني خلال الفترة من ١ يناير إلى ٣١ ديسمبر ٢٠١٨. العمل الحالي هو دراسة وصفية من ١٩٦ حالة تشمل كلا الجنسين من جميع الفئات العمرية. وقد تم جمع البيانات من خلال نظام الإيداع الإلكتروني للمستشفى و تحليل البيانات فيما يتعلق بالبيانات الديموغرافية، وقت حدوث الكسر، سبب الكسر، نوع الكسر، نوعية العلاج، النتيجة النهائية. وقد تم استبعاد حالات كسور الحوض الناتجة عن اسباب مرضية. وأسفرت النتائج لهذه الدراسة عن أن اصابات كسور الحوض اعلى فى الفئة العمرية من ٢١ إلى ٤٠ سنة، فى الذكور اعلى من الاناث، فى مناطق الحضر اعلى من المناطق الريفية و فى وقت النهار اعلى من المساء. وقد جاءت حوادث الطرق (السيارات والدراجات البخارية) فى المرتبة الاولى لاسباب كسور الحوض الاصابية. كما أن نسبة كسور الحوض المعقدة كانت اعلى من كسور الحوض الفردية وكذلك كانت نسبة التدخل الجراحي اعلى من العلاج التحفظي فى حالات كسور الحوض بالمستشفى. وقد كان التحسن هو الغالب بنسبة كبيرة تقارب ٨٨% فى حين ان نسبة الوفاة كانت ٢% فقط وكانت مرتبطة فقط بالفئة العمرية اكثر من ٦١ سنة.