



Original Research Article

Pelvic Fracture - A Retrospective Autopsy Study

A. G. Vijay Kumar¹, S. Shiva Prakash²

¹Assistant Professor, Dept of Forensic Medicine & Toxicology, Adhichunchanagiri Institute of Medical Sciences, Mandya, Karnataka, India.

²Lecturer, Dept of Anatomy, JSS Medical College, Mysore.

Corresponding Author: A. G. Vijay Kumar

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ABSTRACT

Introduction: The pelvis is a ring-like structure of bones at the lower end of the trunk. The two sides of the pelvis are actually three bones (ilium, ischium, and pubis) that grow together as people age. Strong connective tissues (ligaments) join the pelvis to the large triangular bone (sacrum) at the base of the spine.

Material and methods: In this retrospective study, fatal cases of pelvic trauma autopsied during the period 1st January 2011 to 31st December 2013 were analyzed at the Department of Forensic Medicine & Toxicology, AIMS, B G Nagar, Karnataka. During this study several epidemiological observations and their results were considered.

Results and Discussion: In our study total numbers of autopsied cases during 2011 to 2013 are 323. In that 50 (15%) cases had pelvic fracture. Maximum number of victims belongs to 21-30 years (19 cases; 38%) decade followed by 41-50 years (12 cases; 24%). The victims in most of the cases sustained road traffic accidental injuries (43 cases; 86%) followed by fall from height (07 cases; 14%).

Conclusion: Pelvic fractures can be dangerous to one's physical health. As the human body ages, the bones become more weak and brittle and are therefore more susceptible to fractures. Certain precautions are crucial in order to lower the risk of getting pelvic fractures. This can be very dangerous because the pelvis supports many internal organs and can damage these organs.

Key words: Pelvic fracture, Road traffic accident, Falls from height.

INTRODUCTION

The pelvis is a ring-like structure of bones at the lower end of the trunk. The two sides of the pelvis are actually three bones (ilium, ischium, and pubis) that grow together as people age. Strong connective tissues (ligaments) join the pelvis to the large triangular bone (sacrum) at the base of the spine. This creates a bowl-like cavity below the rib cage. On each side, there is a

hollow cup (acetabulum) that serves as the socket for the hip joint.

The incidence of pelvic fractures in the United States has been estimated to be 37 cases per 100,000 person-years. The incidence of pelvic fractures is greatest in people aged 15-28 years. In persons younger than 35 years, males sustain more pelvic fractures than females; in persons older than 35 years, women sustain more pelvic fractures than men. Most pelvic fractures

that occur in younger patients result from high-energy mechanisms, whereas pelvic fractures sustained in the elderly population occur from minimal trauma, such as a low fall. [1]

Pelvic fractures represent 3% to 6% of all fractures in adults and occur in up to 20% of all polytrauma cases. They display a bimodal distribution of age with most injuries occurring in the age ranges 15 to 30 and over 60 years; up to 75% of all pelvic injuries occur in men. [2]

Unstable pelvic fracture is estimated to occur in up to 20% of pelvic fractures; a further 22% of pelvic fractures will remain stable despite significant damage to the pelvic ring. The remaining 58% of pelvic fractures are less serious retaining both haemo-dynamic and structural stability. [3]

The incidence of pelvic fracture resulting from blunt trauma ranges from 5 - 11.9%; with obese patients more likely to sustain a pelvic fracture from blunt trauma than non-obese patients. [4]

Pelvic fracture associated with penetrating trauma is far less frequent. Open pelvic fractures are rare and account for only 2.7 - 4% of all pelvic fractures.

The mortality from pelvic fractures in patients who reach hospital is reported to be between 7.6% and 19%. [5] Although exsanguinating haemorrhage from pelvic fracture is of appreciable concern, studies also suggest that the associated abdominal and pelvic injuries caused by the pelvic fracture or from other system injuries from the considerable energy transfer account for the cause of death in these patients. The mortality from open pelvic fractures is much higher and approaches 50%. [6]

Hemorrhage is the cause of death in 40% of all pelvic trauma victims and the leading cause of death (60% of fatal cases) in unstable pelvic fracture. Bleeding is usually retroperitoneal, the volume of blood

loss correlates with the degree and type of pelvic disruption.

Reported mortality rates range from 6.4% to 30% depending on the type of pelvic fracture, haemodynamic status, and the nature of concomitant injuries and their complications.

The mortality rate among haemodynamically stable patients is around 10%, whereas the mortality rate amongst haemodynamically unstable patients approaches 20-30% but has been reported to be as high as 50% in cases of unstable open fracture; combined mortality approaches 16%. [7]

MATERIALS AND METHODS

In this retrospective study, fatal cases of pelvic trauma autopsied during the period 1st January 2011 to 31st December 2013 were analyzed at the Department of Forensic Medicine & Toxicology, AIMS, B G Nagar, Karnataka. During this study several epidemiological observations and their results were considered.

RESULTS

Table no-1: Incidence of pelvic fracture cases.

| TOTAL NO. OF AUTOPSIED CASES | TOTAL NO. OF PELVIC FRACTURE CASES |
|------------------------------|------------------------------------|
| 323 | 50 |

Table no-2: Age and Sex wise distribution of cases.

| Sr.no. | Age group | No.Of cases | Male | Female | Total |
|--------|-------------|-------------|------|--------|-------|
| 1 | < 20 YRS | 03 | 03 | 00 | 03 |
| 2 | 21 - 30 YRS | 19 | 16 | 03 | 19 |
| 3 | 31- 40 YRS | 09 | 08 | 01 | 09 |
| 4 | 41- 50 YRS | 12 | 08 | 04 | 12 |
| 5 | >50 YRS | 07 | 04 | 03 | 07 |
| Total | | 50 | | | 50 |

Table no-3: Manner of Injury.

| MANNER OF INJURY | NO. OF CASES | PERCENTAGE |
|-----------------------|--------------|------------|
| ROAD TRAFFIC ACCIDENT | 43 | 86% |
| RIDER | 16 | 32% |
| DRIVER | 12 | 24% |
| PASSANGER | 08 | 16% |
| PEDESTRIAN | 07 | 14% |
| FALL FROM HEIGHT | 07 | 14% |

DISCUSSION

In our study total numbers of autopsied cases during 2011 to 2013 are 323. In that 50 (15%) cases had pelvic fracture. Maximum number of victims belongs to 21-30 years (19 cases; 38%) decade followed by 41-50 years (12 cases; 24%). The victims in most of the cases sustained road traffic accidental injuries (43 cases; 86%) followed by fall from height (07 cases; 14%).

Pelvic fracture is a disruption of the bony structure of the pelvis, including the hip bone, sacrum and coccyx. The most common cause in elderly is a fall, but the most significant fractures involve high-energy forces such as a motor vehicle accident, cycling accidents, or a fall from significant height. Because of the forces involved, pelvic fractures frequently involve injury to organs contained within the bony pelvis. In addition, trauma to extra-pelvic organs is common. Pelvic fractures are often associated with severe hemorrhage due to the extensive blood supply to the region.

One specific kind of pelvic fracture is known as an 'open book' fracture. This is often the result from a heavy impact to the groin (pubis), a common motorcycling accident injury. In this kind of injury, the left and right halves of the pelvis are separated at front and rear, the front opening more than the rear, i.e. like opening a book. Depending on the severity, this may require surgical reconstruction before rehabilitation. Forces from an anterior or posterior direction, like head-on car accidents, usually cause external rotation of the hemipelvis, an "open-book" injury. Open fractures have increased risk of infection and hemorrhaging from vessel injury, leading to higher mortality.^[8]

According to study done by Poole GV, Pelvic hemorrhage has been implicated as the cause of death in 50% of patients who die following pelvic fractures. To establish

correlates of morbidity and mortality from pelvic fractures due to blunt trauma, we reviewed 236 patients treated during 4 years. The average age of the 144 men and 92 women was 31.5 years, the average Injury Severity Score was 21.3, the average blood requirement was 5 units, and the average hospital stay was 16 days.^[9]

According to study done by Poole GV, almost two thirds of patients were injured in motor vehicle accidents, and about one eighth were pedestrians struck by a vehicle. Smaller numbers were injured in crushing accidents, motorcycle accidents, falls, and miscellaneous injuries. Only 32 patients (9%) had an isolated pelvic fracture. Associated injuries to the head, chest, abdomen, and upper and lower extremities were frequent, and these injuries often had a greater impact on outcome than the pelvic fracture. Twenty-eight patients died an overall mortality rate of 8%. Only four deaths (14.3%) were a direct result of the pelvic fracture, and bleeding from a transected femoral artery contributed to one of these deaths. Most deaths were caused by severe head injury, non pelvic hemorrhage, and multiple organ failure.^[10]

CONCLUSION

Pelvic fractures can be dangerous to one's physical health. As the human body ages, the bones become more weak and brittle and are therefore more susceptible to fractures. Certain precautions are crucial in order to lower the risk of getting pelvic fractures. This can be very dangerous because the pelvis supports many internal organs and can damage these organs.

Early suspicion, identification and management of a pelvic fracture at the pre-hospital stage are essential for reducing blood loss. Pelvic fracture is also a marker for considerable energy transfer and severity

of injury, and therefore allows appropriate triage of the patient.

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