

# Frequency of Delayed Onset of Traumatic Extradural Hematoma in Patients Presenting with Head Injuries

FAIZYAB AHMED<sup>1</sup>, IRUM BUKHARI<sup>2</sup>, SALEEM SHAH<sup>3</sup>, SAJJAD MEHMOOD<sup>4</sup>, NADIA BANARAS<sup>5</sup>, SHAHJAHAN<sup>6</sup>

<sup>1</sup>Consultant Neurosurgeon Jinnah Postgraduate Medical Centre, Karachi

<sup>2</sup>FCPS Neurosurgery, Associate Professor Neurosurgery Jinnah Postgraduate Medical Centre, Karachi

<sup>3</sup>Consultant Neurosurgery, Bolan Medical Complex Hospital Quetta

<sup>4</sup>Demonstrator Mekran Medical College Turbat

<sup>5</sup>Consultant Neurosurgery, Bolan Medical Complex Hospital Quetta

<sup>6</sup>Medical officer, Taluka hospital Pano Akil

Correspondence to: Faizyab Ahmed, Email: [faizyab35@gmail.com](mailto:faizyab35@gmail.com)

## ABSTRACT

**Objective:** To assess the frequency of delayed traumatic extradural hematoma in patients presenting with head injuries in emergency of a tertiary care hospital.

**Materials and Methods:** In this case series a total 125 patients who presented with head injury were included. All patients underwent assessment on Glasgow Coma Scale (GCS) and score was noted at baseline. Then patients were managed according to hospital protocol. After procedure, patients were shifted to post-surgical ward and were followed-up for 5 days. After 3 and 5 days, CT scan was done to assess presence or absence of extradural hematoma.

**Results:** Mean age of patients in this study was  $34.53 \pm 10.82$  years. In this study 86 (68.8%) patients were male and 39 (31.2%) patients were female. In this study, 20 (16%) patients had delayed onset of Traumatic extradural hematoma in patients presenting with head injuries. DEDH was diagnosed in 45% patients having age 20-30 years, in 35% patients having age 31-40 years and in 20% patients having age >40 years. DEDH was diagnosed in 13 (65%) patients having baseline GCS 11-12, in 20% patients having GCS 8-10, in 15% patients having GCS 13-14.

**Conclusion:** In this study frequency of delayed onset of Traumatic extradural hematoma in patients presenting with head injuries was 16%. Highest frequency (45%) was seen in the younger age group; 20-30 years, among male (65%) patients and those having baseline GCS in the range 11-12 (65%).

**Keywords:** Traumatic extradural hematoma, delayed onset, head injury.

## INTRODUCTION

The incidence of death and disability resulting from traumatic brain injury is at an all-time high worldwide. Every year, approximately one and a half million people die as a result of the condition, and several millions more require emergency treatment.<sup>1</sup> An epidural hematoma, also known as epidural bleeding, is a type of traumatic brain injury that occurs when there is a buildup of blood between the dura mater (the tough outer membrane of the central nervous system) and the skull. This can also be referred to as an epidural hematoma. Epidural hematomas can be fatal. Due to the fact that the spinal cord is also protected by a layer of dura mater, epidural bleeding can also take place anywhere along the spinal column.<sup>2,3</sup>

Delayed extra-dural hematoma (DEDH) is a type of extradural hematoma that does not develop immediately after injury and therefore is diagnosed days after injury on follow-up CT scans.<sup>4</sup> There are some cases in which the EDH is visible on the initial CT scan; however, its size is typically quite negligible. Consequently, a better definition would be "epidural bleeding that is not visible on the initial computerized tomography (CT) scan made after trauma but is visible on a subsequent CT scan."<sup>5</sup>

According to published studies, DEDH accounts for 9-10% of all EDHs. Some authors claim that there is no distinction between the clinical presentation of EDH and DEDH, but it is important to take into account certain risk factors to prevent any unnecessary delay in providing the correct treatment.<sup>6</sup>

One of the risk factors for developing DEDH is a rapid drop in intracranial pressure (ICP), which can be accomplished medically with drugs like mannitol<sup>4</sup> or surgically with the removal of a contralateral hematoma, which can release the tamponade effect and encourage additional bleeding as well as an increase in hematoma size of 4 to 8—especially when there is a corresponding skull fracture contralateral to the site of the hematoma.<sup>7,8</sup>

Although mild head injuries are the most common type of DEDH reported in the literature, it can also happen with moderate or severe head injuries, and almost all DEDH patients are reported to have skull fractures as a common symptom.<sup>4,9</sup> The aim of this study was to assess the frequency of delayed traumatic extradural hematoma in patients presenting with head injuries in emergency of a tertiary care hospital.

## METHODS

A total of 125 patients who presented with head injury were included. The study was conducted from 5-12-2020 to 5-6-2021 in the department of Neurosurgery, Jinnah Postgraduate Medical Centre, Karachi. Inclusion criteria was age 16-70 years of either gender, GCS scores >7, and time of presentation to hospital within 24 hours after road traffic accident. Exclusion criteria was non-traumatic head injury due to hemorrhagic stroke, Post craniotomy hematoma and Cases presenting after 24 hours of road traffic accident.

Informed consent was taken. In addition, demographic information such as age, gender, the cause of injuries such as a car accident, falling from a height, or getting into a fight, and the length of injuries were gathered. Then all patients underwent assessment on GCS and score was noted at baseline. Then patients were managed according to the hospital protocol by a single surgical team with assistance of researcher. After procedure, patients were shifted to post-surgical ward and were followed-up for 5 days. After 3 and 5 days, CT scan was done to assess presence or absence of extradural hematoma. A delayed traumatic extradural hematoma is defined as a collection of blood that forms between the inner surface of the skull and the outer layer of the dura.

Data was entered and analyzed by SPSS V21. Frequency and percentage were calculated for DEDH.

## RESULTS

Mean age of patients was  $34.53 \pm 10.82$  years. In this study 86 (68.8%) patients were male and 39(31.2%) patients were female. Mean duration of injury in this study was  $2.33 \pm 0.58$  hours. Mean GCS score at baseline was  $11.24 \pm 1.39$ . Minimum and maximum GCS score at baseline was 8 and 14 respectively.

In this study, 20 (16%) patients had delayed onset of DEDH (Figure 1).

DEDH was diagnosed in 45% patients having age 20-30 years, in 35% patients having age 31-40 years and in 20% patients having age >40 years (Table 2).

DEDH was diagnosed in 13 (65%) patients having baseline GCS 11-12, in 20% patients having GCS 8-10, in 15% patients having GCS 13-14 with p-value of 0.53 (Table 3).

Table 1: Baseline Characteristics.

Age	34.53±10.82
Gender	
Male	86 (68.8%)
Female	39 (31.2%)
Injury Duration	2.33±0.58
GCS Score	11.24±1.39

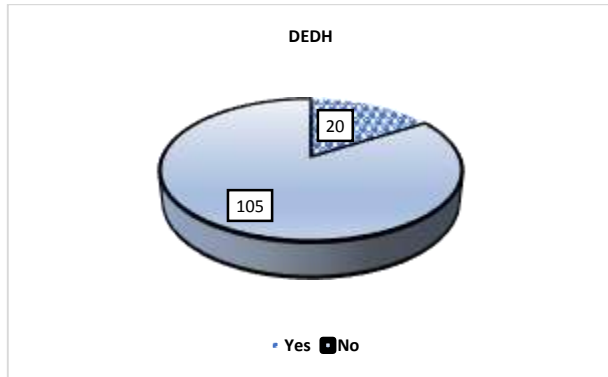


Figure 1: Frequency of DEDH.

Table 2: Association of Age with DEDH.

Age (Years)	DEDH		P-value
	Yes	No	
20-30	9 (45%)	59 (56.2%)	0.64
31-40	7 (35%)	20 (19.0%)	
>40	4 (20%)	26 (24.8%)	

Table 3: Association of Baseline GCS score with DEDH

Baseline GCS score	DEDH		P-value
	Yes	No	
8-10	4 (20%)	24 (22.9%)	0.53
11-12	13 (65%)	55 (52.4%)	
13-14	3 (15%)	26 (24.8%)	

## DISCUSSION

In adults, traumatic injuries to the head are one of the leading causes of unnatural death as well as the leading cause of disability. Patients who receive prompt treatment after traumatic extra-axial cerebral mass abrasions, such as extradural hematoma and subarachnoid hemorrhage, have a better chance of recovering from their injuries. This is because neurosurgical intervention can treat a variety of head injuries, including extradural hematoma and subarachnoid hemorrhage.<sup>10</sup> Because an intracranial hematoma is considered to be a very serious complication following a head injury, it is necessary to make a prompt diagnosis and initiate treatment or other forms of intervention as soon as possible. However, in developing countries like Pakistan, where the facility of CT scan is not widely available, the diagnosis is still able to be predicted by taking the patient's clinical history and determining whether or not there are any fractures in the patient's skull bone using plain x-ray films.<sup>11</sup>

EDH is a condition that primarily affects young adult males, who are the foundation of society's economy.<sup>12</sup> The average age of presentation in our series is 34 years, and men present about 2 times more frequently than women. The greater prevalence of men may be attributed to women's lower participation in outdoor activities. In their case series of DEDH, Gosh et al. reported a mean age of 28 years and an 85% male percentage.<sup>13</sup>

The reported incidence of delayed extradural hematoma varies from 5.6% to 13.3%.<sup>14, 15</sup> In a study, among 80 consecutively treated cases, delayed traumatic extradural hematoma was observed in 8.75%.<sup>16</sup> Another study showed that delayed traumatic

extradural hematoma occurred in 5% cases.<sup>17</sup> In this study the incidence of DEDH was 16%.

In our study, majority of the patients who developed DEDH were of age 20 to 40 years, 45% of age group 20-30 years and 35% of age group 31-40 years. Ullah et al. reported ECH incidence of 35.42% among patients of age 21-40 years and 11.45% among patients of age <40 years.<sup>10</sup>

DEDH is a condition that affects very few people but is linked to extremely high mortality and morbidity rates. Before transferring any patients who have EDH to the ward, they should first be monitored in the intensive care unit (ICU) for at least twenty-four hours and have a follow-up CT brain performed. When treatment begins sooner rather than later, patients typically have better outcomes. Patients diagnosed with DEDH who also have other brain injuries may have a more serious outcome than those diagnosed with DEDH who do not have associated brain injuries. As of right now, there is no consistent set of symptoms that points to the development of DEDH, and additional research is required to establish standard management guidelines for the early detection of patients who have the potential to develop DEDH.

## CONCLUSION

In this study frequency of delayed onset of Traumatic extradural hematoma in patients presenting with head injuries was 16%. Highest frequency (45%) was seen in the younger age group; 20-30 years, among male (65%) patients and those having baseline GCS in the range 11-12 (65%).

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