Bir Hospital receives many trauma patients of which high proportion are head injuries. Over the last 30 years there have been improvements in the provision of care and facilities available at Bir Hospital. It is a high time to evaluate the current trend of head injury and their outcomes. This is a retrospective study to find the frequency and aetiology of head injury and their final outcome at a tertiary level referral hospital.

An Audit of Head Injury at Bir Hospital

Bir Hospital receives many trauma patients of which high proportion are head injuries. Over the last 30 years there have been improvements in the provision of care and facilities available at Bir Hospital. It is a high time to evaluate the current trend of head injury and their outcomes. This is a retrospective study to find the frequency and aetiology of head injury and their final outcome at a tertiary level referral hospital. This study intends to find the changing trends of head injury over time, too. Data on all patients with head injury attending Bir Hospital were collected retrospectively for a period of six months (April 2008-October 2008). Conscious level was assessed in terms of Glasgow Coma Scale.

There were 342 admissions out of the total patients who attended Bir Hospital Casualty. Only a minority of patients with head injury who attended Bir Hospital casualty were admitted. Male and female ratio was 3:1. Surgery including evacuation of intracranial haematomas was required in 95 (28%) cases. Majority (74%) of the patients had favourable outcome at discharge. The number of patients who died during hospital admission was 24, the head injury mortality being 7%.

The mortality of head injury at Bir Hospital is low in this study and seems to be on the decreasing trend over the last 30 years.

**Key Words:** head injury, intracranial haematoma, trauma

This is a retrospective study to find the frequency and etiology of head injury and their final outcome at a tertiary level referral hospital. Moreover, this study aims to find the changing trends of head injury over time. Data on all patients with head injury attending Bir Hospital were collected retrospectively for a period of six months. Conscious level was assessed in terms of Glasgow Coma Scale.

**Materials and Methods**

This is a retrospective study to find the frequency and aetiology of head injury and their final outcome at a tertiary level referral hospital. Data on all patients with head injury attending Bir Hospital were collected retrospectively for a
Results

During the one year period encompassing the study period, there were a total of 8274 trauma patients attending the Emergency Department of Bir Hospital. Out of these, the victims of road traffic accidents, fall and physical assaults were 3278, 2882 and 2114 respectively. During the study period of six months, 674 (63.7%) patients with head injury due to the physical assault attended ER of Bir Hospital while 632 (38.5%) did so for the RTA resulting in head injury. The total number of patients of head injury due to fall who attended ER of Bir Hospital could not be retrieved. However, the patients who were admitted with head injury due to fall were 81 (Figure 1). The following findings were revealed after analysis of the causes of head injury for the 184 patients from the total admitted patients: 81 (44%) patients had a fall, 37 (20%) met an RTA and 11 (6%) were physically assaulted. It is very unusual that the cause of injury in 55 (30%) patients were unknown (Figure 2). The total number of patients who needed admission for head injury during this six month study period was 342.

Out of the admitted patients, 264 (77%) were male and only 78 (23%) were female, the male and female ratio being about 3:1 (Figure 3). Majority (53%) of the patients were in the productive age group while only 29 (8%) patients were...
above 60 years old (Figure 4). Non-surgical (conservative) treatment was carried in 247 (72%) patients while surgical treatment was carried in 95 (28%) (Figure 5).

The cranial procedures that were performed on the patients in the descending order were craniotomy (37), burr hole evacuation of haematoma (25), elevation of compound depressed skull fracture (16), debridement of lacerated scalp wounds (14) and craniectomy in three patients. The burr hole surgery group included subacute and chronic subdural haematomas. The total number of patients requiring cranial surgery was 95 (27.8%) (Figure 6). Due to improper documentation, the outcome of 181 patients could not be retrieved. The following outcome was achieved in the remaining 161 patients at the time of discharge: good recovery in 97 (60%), moderate disability in 23 (14%), severe disability in 13 (8%) and vegetative state in 4 (2.5%). There were 24 (7%) deaths among the total admitted patients of 342. (Figure 7).

Discussion

Although Rowbotham (1949) published data about head injured patients many years ago, the first accurate epidemiological data were provided by Jennett and Macmillan. The latter’s study based on the survey of all Scottish hospitals for 1974 showed an annual attendance rate of patients with head injury of 1780 per 100,000 populations, with variations according to age and sex and the cause of injury. Head injuries accounted for about 10% of new attendees at accident and emergency departments in Scotland, and for 15% of those attending after recent trauma; about one attendee in five was admitted.3

Every year approximately 2 million Americans suffer a traumatic brain injury: one injury occurs every 15 second.1 In India, every minute there is an accident and every eighth minute there is a death.5

Nepal has dearth of data regarding trauma. About a decade ago, Paudel did a hospital based study and he extrapolated the data to get the National Incidence of Trauma and it was 0.79%. Head injury constituted 35% of the total trauma victims and the present study shows similar result especially in head injury due to RTA (Figure 1). Fall from height and RTA numerically outnumbered other modes of injury. Paediatric (0-15 years) and elderly (>61 years) constituted one fourth (24.8%) of the victims, majority of them were pedestrians. The mortality rate for trauma victims was 6%.7

The national survey (2007) based on ‘verbal autopsy methodology’ found that 3% of under-five deaths (1,300 in number) were due to injury. For children aged 12-59 months, injury was the fourth common cause of deaths accounting to as high as 11% of all deaths.6

Unfortunately, Nepal does not have annual incidence rate of head injury. The present study over the period of six months found that 674 (63.7%) patients due to the physical assault and 632 (38.5%) patients of RTA both resulting in head injury attended Bir Hospital Casualty. This data clearly shows that more physically assaulted patients had head injury than RTA patients. However, the head injury due to the former cause is less likely to lead to admission than other causes; e.g. RTA (Figure 2). The head injuries due to the physical assault seems to be on the increasing trend from zero in the study of Gongal and Devkota (1979) to 6% in the present series.2 The total number of patients of head injury due to fall who attended ER of Bir Hospital

Figure 6: Types of surgery

Figure 7: Outcome based on GOS.

Figure 8: Head injury mortality trend over time at Bir Hospital.
could not be retrieved. However, fall (44%) topped the list of causes of head injury among other causes of head injury in admitted patients, RTA (20%) being the second and the physical assault (6%) the third common cause of head injury. Due to the improper documentation the cause of head injury in 158 patients could not be identified. The causes of head injury in the present study are similar with other previous studies at Bir Hospital.\textsuperscript{2,4,8}

This study as other previous studies showed male preponderance in head injury (Figure 3).\textsuperscript{2,4,8}

The present study showed that the children/young adults below 20 years were 39% (Figure 4). Gonal et al showed that children below 14 years constituted 52.2% of the total patients with head injury.\textsuperscript{2} This finding was supported by a prospective study of head injury at Bir Hospital\textsuperscript{2} and it showed that 58.1% of head injured patients were children below 15 years.\textsuperscript{8}

Out of the total 342 admitted patients, 95 (28%) required cranial surgeries (Figure 5). This is in contrast with other previous studies of head injury at Bir Hospital.\textsuperscript{2,4,8} The more number of surgeries in the present series might be due to the low threshold for craniotomy for intracranial haematoma evacuation and other reasons might be that this study includes burr hole evacuation for chronic subdural haematomas and 14 cases of debridement of lacerated scalp wounds, too (Figure 6).

Due to improper documentation, the outcome of 181 patients could not be retrieved. The following outcome was achieved in the remaining 161 patients at the time of discharge: good recovery in 97 (60%), moderate disability in 23 (14%), severe disability in 13 (8%), vegetative state in 4 (2.5%) and 24 (7%) patients died (Figure 7). These findings are very similar with the findings of the previous study.\textsuperscript{2,4,8} Compared to the study of Shrestha, this study has higher percentage of patients in vegetative state and with severe disability and lower percentage of patients with good recovery.\textsuperscript{8} This might be due to selection bias of the patients as this study analyzed the outcome of only admitted patients at the time of discharge and naturally those patients who need admission are supposed to maintain more severe forms of head injury. However, the overall mortality in this series is only 7% and this is among the admitted patients only. Although this data of mortality is comparable with earlier studies,\textsuperscript{2,4,8} other studies included all the head injuries including the mild head injuries who could be discharged directly from the ER except Gonal et al study that included only admitted patients.

The mortality of head injury at Bir Hospital has decreased over the last 30 years (Figure 8). The possible reasons for this might be various: the improved resuscitation in ER thus reducing secondary brain damage, increased personnel in neurosurgical team, and improved Neuro-ICU facilities at Bir Hospital, for example, increased ventilators and monitoring capacity and nursing staff experienced in neurosurgical care. The other reason might be the availability of CT Scans and prompt referral of resuscitated patients from peripheral hospitals.

**Conclusion**

Head injury is common in children and adolescents. Physical assault is the commonest cause for head injury presenting to Bir Hospital. However, the head injury due to the physical assault is less likely to lead to admission than other causes, for example, RTA. Head injury mortality is reducing at Bir Hospital.

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