An Autopsy Study of Liver Injuries in a Tertiary Referral Centre of Eastern Nepal

ABSTRACT

Background: Liver is the largest gland in the body and it frequently gets wounded. The objective of this study was to determine the patterns, types and severities of liver injuries which were caused by mechanical trauma and to study the organs associated with liver injuries.

Material and Methods: This was a hospital based, cross sectional study which was conducted on the autopsies showing the evidence of liver injuries in the mortuary of a tertiary hospital in eastern Nepal. All consecutive autopsy cases which were handled within one year’s time (n=46) were included in our study. The cases were studied in detail for liver injuries, which included age, sex, severity, associated injuries, site of the injury, description of the injury, etc.

Results: The mean age of the victims was 33.87 years and there was a male: female ratio of 3.6:1. The injuries had resulted from blunt trauma in 41 (89.1%) cases, the most common of which was road traffic accidents, constituting 37 (80.4%) cases. Grade III injuries were seen in 14 (30.4%) cases. Laceration of the liver was the most frequent finding that was evident in 34 (73.9%) cases. Right lobe of the liver was injured in 30 (74%) cases. The sole presence of liver injuries among abdomino-pelvic organs was seen in 14 (30.4%) cases. In 40 (87%) cases, liver injuries were associated with other regional injuries.

Conclusion: Laceration is the most common liver injury among autopsy cases. Right lobe is mostly affected and grade III injuries are the most common ones. Liver injuries are frequently associated with other abdomino-pelvic organs and multiple regional injuries.

Key words: Liver injury, Autopsy, Abdominal injuries

BACKGROUND

Injuries and violence related fatalities are subjected to medico-legal examinations in Nepal [1]. Autopsy still remains the “gold standard” by which the physician’s clinical diagnosis is confirmed, amended or refuted. It is the most reliable and accurate instrument for investigation of injuries [2]. Early recognition of the injuries and providing an immediate treatment are mandatory for saving the lives of many of these patients [3]. If they are overlooked and neglected, their situations would eventually have medico-legal implications [4].

Liver is the largest gland in the body [5]. In patients with abdominal trauma, the liver is the most frequently injured organ. Owing to its size, fixed position and friable consistency, the liver gets frequently wounded. It may also be lacerated by the fractured ends of the ribs, which perforate the diaphragm. Ruptures usually involve the right lobe, and they occur in the anterior surface and the inferior border. It is more easily lacerated if it is enlarged and fatty. Rupture of the liver causes immediate death due to shock and haemorrhage, especially if the portal vein or the inferior vena cava is injured [6]. A liver injury is the second leading cause of death, which results from blunt trauma and the liver is commonest organ to get injured acquiring penetrating injuries [7].

A blunt impact on the upper abdomen can compress and injure the liver and spleen before a significant whole-body motion occurs. In the liver, compression increases intra-hepatic pressure and it generates tensile or shear strains. If the tissue is sufficiently deformed, laceration of the major hepatic vessels, which occurs, can result in a haemoperitoneum. Abdominal deformation also causes lobes of the liver to move relative to each other, stretching and shearing the vascular attachment at the hilar region [7]. An accurate and a detailed understanding of the frequency and types of injuries leads to more accurately targeted measures of prevention, diagnostic algorithms, education and capital investment management.

OBJECTIVES OF THE STUDY

• To study the patterns, types and severities of liver injuries which were caused by mechanical trauma.
• To study the associated organs with liver injuries.

MATERIAL AND METHODS

This was a hospital based, cross sectional study which was conducted on the autopsies showing the evidence of liver injury conducted in the mortuary of a tertiary hospital in eastern Nepal. All the cases which were handled within one year time (14.04.2010 to 13.04.2011) were included in our study. The number of cases was 46. In each case, a routine medico-legal autopsy was performed and all injuries were noted. The cases were studied in detail for liver injuries, which included age, sex, associated injuries, site of the injury, description of the injury, etc.

The liver injuries were described according to the Organ Injury Scale and Abbreviated Injury Scale (AIS) 2005 update 2008. The AIS is an anatomically based, global severity scoring system that classifies each injury into nine distinct anatomic regions on a six-point ordinal scale (1 is a minor injury and 6 is a maximum injury which is currently untreatable) [8]. The AIS grading can be equilibrated to the Organ Injury scale. The Organ Injury Scales were developed by the Organ Injury Scaling Committee of the American Association for the Surgery of Trauma (AAST). Each organ injury can be graded from 1 to 6. Grade 1 is assigned to the category of a least severe injury, while grade 6 is assigned to the most severe injury in which the patients have chances for survival. Grade 6 injuries are, by definition, not salvageable and they are severe enough to claim the patients’ lives [9, 10] [Table/Fig-1].

Inclusion and exclusion criteria: All the autopsies which showed liver injuries which were caused by mechanical trauma were included in our study. The bodies that were decomposed and those whose cause of trauma was unknown, were excluded from the study.
Liver Injuries were graded by using Organ Injury scale and AIS 2005 and the results have been shown in [Table/Fig-2].

Laceration of the liver was the most frequent finding that was evident in 34 (73.9%) cases, followed by haematoma, which was seen in 3 (6.5%) cases, while haematoma, as a sole manifestation, was evident in only one case.

Right lobe of the liver was mostly injured. The involvement of right lobe was seen in 34 (73.9%) cases, that of left lobe was seen in 5 (10.9%) cases and a bilobar involvement was seen in 7 (15.2%) cases. The convex surface was the most common site which was affected by all the types of injuries. Its involvement was seen in 27 (58.7%) cases. Injuries on the inferior surface were detected in 12 (26%) cases and on those on the diaphragmatic surface were detected in 7 (15.2%) cases.

The predominant injury site was the right hepatic lobe in our study. This result was similar to that of many studies which had been conducted earlier [3, 12, 15-17]. The greater preponderance of right sided liver injuries could be explained on the basis of the bulkier size of the right sided liver, which could have led to a greater vulnerability of it bearing more impact. The right lobe of liver is not bulkier size of the right sided liver, which could have led to a greater vulnerability of it bearing more impact. The right lobe of liver is not

The most vulnerable age group in our study was 16-30 years. This age group leads a more active life and is at the peak of its activity, having the tendencies of taking risks, alcoholic intoxication, etc., thereby subjecting itself to the dangers of accidents and injuries. Males were predominantly involved in our study and the male: female ratio was 3.6:1. The fact that males are usually the earning members of the families makes them more mobile and thus, vulnerable to accidents and construction and industrial mishaps, as compared to females who mostly indulge in household chores. A similar pattern was shown by other studies also [3, 11-16].

Blunt trauma was the predominating trauma mechanism in the study population. The overwhelming bulk of liver injuries were caused by road traffic accidents. Non-penetrating injuries, as the common cause of liver trauma, has also been mentioned in other similar studies [3, 11, 14-16].

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was in contrast to our study findings, as our study included only the fatal group. Our results were similar to those of P Tavling et al., [12] They had studied autopsies with liver injuries. Assessment of the degrees of hepatic injuries may be helpful in determining the outcome and treatment quality at different centres. The medicolegal expert who conducts the autopsy, when he/she is called upon to present his/her autopsy findings in court and to express an opinion regarding the amount of force that may have been applied in order to produce the traumatic lesions which were noted, has to rely on a subjective interpretation of the findings and this may vary from pathologist to pathologist. The scientific grading of injuries provides uniformity among the pathologists.

Liver injuries occur in combination with other abdomino-pelvic injuries, commonly with mesenteric, diaphragmatic and splenic injuries. They can also be associated with multiple regional injuries. P Tavling et al., [12] also reported similar findings. As liver injuries increase in severity, other organ systems may become involved and so, total mortality may result from the cumulation of all damaged organs. This also emphasizes the need of a proper monitoring of the victims of trauma.

CONCLUSION
Laceration is the most common liver injury among autopsy cases. Right lobe is mostly affected, convex surface is the most vulnerable site and grade III injuries are the most common ones. Liver injuries are frequently associated with other abdomino-pelvic organs and multiple regional injuries. Proper identification of hepatic injuries, with a timely response to victims of such trauma and improvement of emergency services in the hospital, may help in saving human lives in a better manner.

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REFERENCES