ABSTRACT

Aims and Objectives: To determine the major injury patterns, outcomes and management options of liver trauma in a tertiary care setup in Karachi, Pakistan. Materials and Methods: A prospective clinical study that was carried out consisted of 61 patients with liver trauma, 58 males and 3 female, with the mean age 31.46 years. Data regarding age, sex, mode and type of injuries were taken and analyzed. Inclusion criteria included age group equals or more than 13 years of age with diagnosis of liver trauma, patients penetrating and non-penetrating traumatic injury to liver, patients with blunt and sharp injury to liver. Exclusion criteria included all the patients’ less than 13 years of age, patients with pre-existing liver disease i.e. cirrhosis, tumors, hepatitis etc, Patients who have previously undergone hepatic surgery. This study was conducted during the time period of 1st January 2010 till 31st December 2011. The data was analyzed using SPSS 17. Results: The incidence of liver trauma due to non-penetrating injuries was 47(77%) while due to penetrating injuries 14 (23.0%), with a value of $p=0.001$. In all cases of blunt injuries, 67.2% patients were presented due to road trauma accidents, and 9.8% patients were due to assaults. In all cases of liver trauma, 08 patients (13%) sustained Grade I liver injury, 27 patients (44.3%) had Grade II liver injury, 20 patients (32.8%) of Grade III liver injuries, 04 (6.6%) patients of Grade IV and 02(3.3%) of Grade V liver injury. 17(27.9%) patients were hemodynamically stable, and managed Medically with strict vital monitoring, input/output charting and repeated examinations. 44(72%) patients were hemodynamically unstable despite aggressive resuscitation and were managed surgically. Conclusion: Non-penetrating liver injuries are most common (77.0%) in our population especially due to road traffic accidents (67.0%). Surgical management has a provital role in saving life where the patient is hemodynamically unstable.

Keywords: Blunt Injury; Hemodynamically Stable; Liver Trauma; Sharp Injury

Introduction

Trauma is one of the leading causes of mortality worldwide for all age groups.¹ The liver is the largest solid abdominal organ and involves majority of metabolic functions of the body.² Despite the relative protection by overlying ribs, it is susceptible to compressive forces by means of blunt trauma that can injure the soft parenchyma.³⁴ Motor vehicle accidents are one of the most frequent causes of traumatic hepatic injury.⁴ There could be a greater propensity for blunt liver injuries to occur in countries where the driver occupies the right side of the vehicle than those where the drivers sits on the left side. Major liver trauma is frequently associated with coagulopathy.⁵ The developments in diagnosis, resuscitation and advent of new surgical technique have opened a new chapter in the management of liver injuries. In the past decades the use of CT SCAN has changed the diagnostic and therapeutic approach to such injuries completely,⁶ decreasing the options for surgical intervention. The purpose of this study was to document different modes of presentation and treatment of liver trauma of the patients and to document morbidity and mortality of cases included in the study in a tertiary care setting in Karachi from 1st January 2000 to 31st December 2001.

Materials and Method

This is a prospective clinical study that was carried out in Jinnah Postgraduate Medical Centre, Karachi, Pakistan from 1st January 2010 to 31st December 2011. It included 61 cases of liver trauma, due to both penetrating and non-penetrating injuries, on the basis of clinical features and fulfilling inclusion criteria, admitted though accident and emergency department.

This study included adult patients both male and female. Clinical data regarding age, sex, mode and type of injuries were taken and recorded. After initial resuscitation, clinical evaluation and thorough examination, those patients who were hemodynamically stable, were admitted to the ward and managed conservatively. Ultrasound or CT SCAN was done in all cases managed conservatively. Patients, who were hemodynamically unstable, managed surgically according to grading of liver injury. Resuscitation, treatment options and outcome were recorded on a performa, which was specifically generated for the purpose.

A database was developed on SPSS for window version 17.0 on the basis of questionnaire. For the quantitative variables mean standard deviation (S.D) was calculated and for their comparison t-test was applied. For the qualitative data chi-square test was used where applicable, other wise yates corrected chi square was mentioned. Inclusion criteria included age group equals or more than 13 years of age with diagnosis of liver trauma, all the patients with penetrating and non-penetrating injury to liver, all the patients with blunt and sharp injury to liver. Exclusion criteria included all patients’ less than 13 years of age, patients with pre-existing liver disease i.e. cirrhosis, tumors, hepatitis etc and patients who have previously undergone hepatic surgery.

Results

The present study consists of 61 patients with hepatic trauma. Thirty patients (49.18%) out of sixty-one, were of liver trauma alone and thirty-one patients (50.81%) of liver trauma with associated injuries. Three patients were female and 58 were male patients with a male to female ratio of 19.3:1.
The mean age of the patients for female was 28.33 ± 4.04 years (mean± S.D) ranging from 24-32 years with median age of 29, and for males it was 31.62 ± 5.28 years (mean± S.D) ranging from 18-42 years with a median age of 32. (Table 1)

In this study, the incidence of liver trauma due to non-penetrating injuries was 47(77%) while due to penetrating injuries 14 (23.0%), with a value of p= 0.001 and Chi-Square=47.66. Out of 47 cases of blunt injuries, 41 patients (67.2%) were injured due to road traffic accidents with a 95% C.I of 19.11-31.16, 06 patients (9.8%) were due to assaults with a 95% C.I of 5.35-43.53. Out of 14(23%) patients of penetrating injuries, 12 patients (19.7%) involve to firearm injuries with a 95% C.I of 5.35-43.52, and 02 patients (3.3%) due to stab injuries with a 95% C.I of 0.02-20.89. the statistical value were p=0.001 and Chi-Square= 94.21. (Table 2)

Out of a total of 61 patients 08 patients (13%) were of Grade I liver injury, 27 patients (44.3%) of Grade II liver, 20 patients (32.8%) of Grade III liver injuries. There were 20 (6.6%) patients of Grade IV and 02(3.3%) of Grade V liver injury. We have not found Grade VI liver injury in our setup. (Table 3). The mortality and morbidity rate in liver trauma varied significantly depending upon the mechanism of injury and impact of injury. Both the patients (3.3%) with liver injury of Grade V and 3 out of 4 patients (9.4%) with Grade IV were expired. The 95% C.I was 0.7-27.8. Both patients of Grade V liver injury expired during surgery because of complex hepatic injuries. Other two were expired on 3rd and 5th postoperative day due to multi organ failure.

In this study out of a total of 61 patients 17(27.9%) patients were haemodynamically stable, and managed medically with strict vital monitoring, input/output charting and repeated examination to assess the conditions. 44(72%) patients were haemodynamically unstable despite aggressive resuscitation and were managed surgically. (Table 4)

The choice of different surgical options for securing homeostasis in liver trauma depends upon type and mode of injury, grade of liver injury, and clinical assessment. Most of liver injuries required simple suture ligation. The incidences of simple suture ligation was done in 18 patients(40%) with a 95% C.I of 16.1-69.5, hepatotomy done in 13 patients(29.8%) with a 95% C.I of 8.9-58.9, absorbable mesh was placed in 03 patients(6.8%) with a 95% C.I of 0.2-31.5, omental patch done in 08 patients(18.2%) with a 95% C.I of 3.4-46.5 and resectional debulking was done in 02 patients(4.5%) with a 95% C.I of 0.0-8.99.

There were 45.9% patients in shock at the time of presentation with increase respiratory rate, pulse rate and decrease in blood pressure. There were 31.9% patients who were haemodynamically unstable and their mean S.O.S was 29.42 ± 30.4, ranging 20.0-340 with a median of 31.0. Pulse Rate with a mean ± S.D of 119.91-10.1, ranging 75.0-135.0 with a median of 122. Systolic blood pressure in this study was of mean ± S.D of 87.87, ranging 75.0-110.0 with a median of 85.0. Shock was defined as systolic blood pressure of 80 mmHg or less. These patients were aggressively resuscitated with crystalloids, colloids and blood products, and shifted to emergency operation theatre for surgery. (Table 5)

Complications developed in patients treated Medically and Surgically. Out of 61 patients, 27 (44.26%) developed chest complications i.e. atelectasis, dry cough, productive cough and pneumonia. 07 patients (11.5%) developed temporary jaundice due to liver injury. Wound infection developed in 06 patients (9.8%) and exploratory biliary fistula developed in 09 patients (14.75%). (Table 6)
developed chest complication i.e. atelectactesis, dry cough, productive cough and pneumonia. Seven patients (11.5%) developed jaundice, wound infection developed in six patients (9.8%) and external biliary fistula developed in nine patients (14.7%).

Conclusion
In conclusion, non-penetrating liver injuries are most common (77.0%) in this study population especially due to road traffic accidents (67.0%). Hemorrhage is the leading cause of death in liver trauma. In hemodynamically stable patients, non-operative management is safe and rewarding. Surgical intervention was found to be live saving in hemodynamically unstable patients.

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References

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