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EVALUATION OF LIVER INJURIES IN VICTORIA HOSPITAL BAHAWALPUR

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Abstract:

Objective: *To determine the major injury patterns, outcomes and management options of liver trauma in a tertiary care setup in Victoria Hospital Bahawalpur .*

Study Design: *Retrospective / clinical study*

Place and Duration of Study: *This study was conducted at the Department of surgery in Victoria Hospital Bahawalpur from 1st Jan 2017 to 31st December 2017*

Materials and Methods: *It consisted of 60 patients with liver trauma, 57 males and 3 females, with the mean age 31.46 years. Data regarding sex, mode, age and type of injuries was analyzed. The inclusion criteria was 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. The exclusion criteria includes all the patients' who are less than 13 years of age, also patients with pre-existing liver disease i.e. tumors, cirrhosis, hepatitis and patients who have previously undergone hepatic surgery.*

Results: *The incidence of liver trauma due to non-penetrating injuries was 46(76.6%), due to penetrating injuries 14 (23.3%), In all cases of blunt injuries,40 patients (86.9%) were due to road traffic accidents, and 6 patients (13.0%) were due to assaults. There were 16 patients who were hemodynamically stable, who were managed medically with strict vital monitoring, input/output charting and repeated examinations.44 patients who were hemodynamically unstable despite aggressive resuscitation and were managed surgically. 9 patients (20%) were treated by simple suture, 15 patients (34%) were treated by suture and perihepatic packing, and20 patients (45%) were treated by perihepatic packing. The patients who underwent perihepatic packing were re-explored after 48 hours. Their abdomen was washed, drains were put in and abdomen was closed permanently.*

Conclusion: *The most common, non-penetrating liver injuries (77.0%) in our population especially due to road traffic accidents (67.0%). The provital role of surgical management has been saving life where the patient is hemodynamically unstable.*

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INTRODUCTION:

Liver trauma has the potential for extensive injuries which must be carefully visualized and investigated to ensure proper management. There have been significant developments as well as changes in the management of liver trauma since last 30 years[1]. Although it is certain that most penetrating injuries require intervention, there is no absolute decision regarding the management of blunt injuries. Earlier as two decades back most blunt injuries were treated surgically to ensure homeostasis and prevent the risk of biliary leaks and sepsis. In majority of cases, the injured liver cease to hemorrhage without any intervention and a conservative approach is relatively safe in hemodynamically stable patients.

Severe hepatic injuries in unstable patients require intervention and several techniques have been designed to stop hemorrhage and repair extensive parenchymal damage.

One of the leading causes of mortality, trauma, is worldwide for all age groups [1]. The liver being the largest solid abdominal organ involves majority of metabolic functions of the body [2]. Even having the relative protection by overlying ribs, it is known to be susceptible to compressive forces by means of blunt trauma that can injure the soft parenchyma [3,4] Motor vehicle accidents are one of the most frequent causes of traumatic hepatic injury [4]. Coagulopathy is frequently associated with major liver trauma [5]. The developments in diagnosis, resuscitation and advent of new surgical technique have opened a new chapter in the management of liver injuries. The use of CT SCAN in the past decades has changed the diagnostic and therapeutic approach to such injuries completely [6], decreasing the options for surgical intervention.

MATERIALS AND METHODS:

This is a retrospective clinical study that was carried out in the Department of Surgery Victoria Hospital Bahawalpur from 1st January 2017 to 31st December 2017. It included 60 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. Both the male and female patients were included in the study. Clinical data regarding sex, mode, age and type of injuries were taken and recorded. After initial resuscitation, thorough examination and clinical evaluation, those patients who were hemodynamically stable, were admitted to the ward and managed conservatively. CT SCAN or ultrasound was done in all cases managed conservatively. The patients who were hemodynamically unstable, managed surgically according to grading of liver injury. The Performa, which was specifically generated for the purpose, has the recorded outcome, options, treatment and resuscitation.

Inclusion criteria included people with more than 13 years of age, and age equals with diagnosis of liver trauma, all the patients with penetrating and non-penetrating injury to liver, all the patients with sharp and blunt injury to liver. Exclusion criteria included all patients' who were less than 13 years of age, patients with pre-existing liver disease i.e. hepatitis, cirrhosis, tumors, etc and patients who have previously undergone hepatic surgery

RESULTS:

Table No.1: Mode of Injury

Number of cases	Penetrating Injury	Blunt Trama
Total 60	14 (23%)	46 (76%)

Table No.2: Type of Treatment

Number of cases	Conservative treatment	Surgical Treatment
60	16 (26.6%)	44 (73%)

Table No.3: Type of Surgical Management

Number of cases	**Primary suturing + perihepatic packing** with topical hemostatic agents	**Primary Suturing**	**Perihepatic Packing**
44	15(34%)	9 (20%)	20 (45%)

The incidence of liver trauma due to non-penetrating injuries was 46(76.6%) while due to penetrating injuries 14 (23.3%), In all cases of blunt injuries,40 patients (86.9%) were due to road traffic accidents, and 6 patients (13.0%) were due to assaults. 16 patients who were hemodynamically stable, were managed Medically with strict vital monitoring, input/output charting and repeated examinations .44 patients who were hemodynamically unstable despite aggressive resuscitation and were managed surgically. 9 patients (20%) were treated by simple suture, 15 patients (34%) were treated by suture and perihepatic packing, and20 patients (45%) were treated by perihepatic packing. T h e patients who underwent perihepatic packing were re- explored after 48 hours. abdomen was washed, drains were put in and abdomen was closed permanently.

Table No.4: Post Opp Complication

No. of cases	**Chest Complication (pneumonia, dry cough, productive cough,)**	**Jaundice**	**Wound infection**	**Burst abdomen**	**Biliary Fistula**
	30 (50%)	4 (6.6%)	9 (15%)	2 (3.3%)	3 (5%)

Table No.5: Types of injuries

Mode of injure	**No of patient**	**Percentage**
Solitary liver injury	20	45%
Associated extra hepatic injury	24	55%

DISCUSSION:

One of the largest solid organs in the body is liver. Although it lies in a safe area of the body, but because of its large size, it makes it an inescapable victim of injury when the abdomen encounters like some traumatic assault. The exact incidence of liver injury is difficult to estimate due to lack of trauma registry in our country, but surely, it is high among our population. The same has been reported not only in our study, but other published studies from different parts of the country. In the current study we observed predominant involvement of males. More frequent involvement of males has also been reported in some other studies in the context of trauma in general as well as liver injuries [7,8-10] The males are more prone to injury because they are more involved in driving, traveling and other outdoor and high-risk activities and because of that they are more frequent victims of assaults such as that firearm injuries and stabs resulting from brawls and fights.

In our study, out of 60 patients, 57 patients were male and 03 were female with a male to female ratio of 19:1, this shows high male to female ratio as compared to other studies because females are most often non-Ambulant. A study conducted in Qatar by Faramawy et al, demonstrated male to female ratio of 11.6:1. The reason for this high percentage of male preponderance is that males are more exposed and projected to trauma than females mainly due to male dominated society and outdoor activities. Similarly, in another study conducted in Saudi Arabia by Barrimahet et al, showed almost twice the number of males to female having road traffic accidents (major cause of traumatic liver injury) in that year.

Our study found more frequent involvement of the youngsters. The same has been found in other studies as well [12-14]. It is also reported that involvement of younger males Predominantly, reflects the socio- economic implications in such injuries. In our study the mechanism of liver injury that is also predominant was blunt, particularly RTAs. Firearm injuries as the predominant mechanism of injury is also reported in Russia and Peshawar [14,15]. As Hemodynamic compromise ended with resuscitation and emergency exploratory laparotomy, because unacceptable delay in transportation, patients with life-threatening injuries of higher grade mostly die on the spot or on route to hospital [16]. In our study, in majority of patients we did perihepatic packing and suture hepatorrhaphy procedures. This is an agreement to other reported studies [13-19]. In fact, perihepatic packing has been great efficacy particularly in patients having liver trauma, and in conditions where blood is not available or in the cases where there are those massive transfusion requirements.

In our study, we strictly followed the policy of putting no more than six abdominal sponges around the liver, so as to avoid the complications of iatrogenic abdominal compartment syndrome. besides this, a variety of other procedures have been employed for liver injury by various researchers with reasonably good success rates. For instance, application of topical hemostatic agents, hepato-omentorrhaphy, tractotomy with finger fracture, extensive hepatorrhaphy, resectional debridement with selective vascular ligation, intra hepatic balloon, angio embolization, veno-venous bypass, and hepatic transplant etc [20-23]. Grade of liver injury, expertise of the surgeon, preference of individual surgeon and institutional practices are the different factors which effect the hemostatic measure. Hence, standardization as well as comparison of the surgical procedures reported by various researchers is difficult to made.

In our study 47 patients (78%) presented with blunt trauma and 13 patients (21.6%) presented as penetrating while in other study 87 patients with hepatic injuries from January 1995 to December 1999. In that, 76% of them had sustained blunt trauma while, 24% had penetrating trauma [24]. In the present study 60 patients were included, out of which 20(45%) patients were with hepatic trauma alone and 24 (55%) patients were of liver trauma with associated injuries while in another study the associated complication was 62 (54.86%) patients had associated injuries [5]. in another study from LRH Peshawar the isolated liver injury was 32.5% while associated liver injuries were 67.5%. In our study 28% patients were found to be hemodynamically stable, and managed medically with strict vital monitoring, input/output charting and repeated examination to assess the conditions. In that 73% of patients were hemodynamically unstable despite aggressive resuscitation and therefore were managed surgically. The choice of different surgical options for securing homeostasis in liver trauma depended on type and mode of injury, grade of liver injury and surgeon own discretion. Most of liver injuries required simple suture ligation. Simple suture ligation was done in 9 patients (20%), 20 patients were managed by perihepatic packing and 15 patients were

managed by perihepatic packing and suturing. while in another study the primary suturing was in done 23% patient while perihepatic packing was done in 45% patient [25].

There were 40% patients in shock at the time of presentation with increase respiratory rate, pulse rate and decrease blood pressure. These patients were aggressively resuscitated with crystalloids, colloids and blood products, and shifted to emergency operation theatre for surgery.

The medical management has been time tested for hemodynamically stable patients of blunt injuries of liver. However, in penetrating injuries, especially in firearm injuries, but still exploratory laparotomy has the choice of management for many years [17]. Objection on this method has been in the current studies that support selective medical treatment in hemodynamically stable cases without associated abdominal injuries. hemodynamically stable Penetrating injured patients having no signs of peritonitis, are recommended to undergo a contrast enhanced CT scan of the abdomen. If any signs show on ultrasonography like hollow viscous perforation or evolving hemodynamic instability, exploratory laparotomy is option for treatment. The grade of the hepatic injury is not contraindicated for conservative management [17,18].

Using the evidence as base, we should evolve regulations and measures to prevent RTAs, thereby reducing the frequency of liver trauma. As majority of our patients have hemodynamic compromise and present late, morbidity and mortality rate can be decreased in our set ups due to good Advance life care trauma support. Public awareness on the issue is imperative.
in our study the chest complication is 49%, while in the study of Imran Ahmad was 44.26%,[26] burst abdomen in our study was 3.3% while it was reported as 1.76% in the study, in our study biliary fistula was reported in 5% patients while in study of LRH Peshawar it has been reported 5% of bile leak. wound infection was reported in our study is 3.3% while reported 10% in LRH Peshawar study. It shows that the results of our study are almost similar to the other reported findings in a periphery teaching Hospital.

CONCLUSION:

In conclusion, non-penetrating liver injuries are most common (78.1%) due to road traffic accident and assault. The leading cause of death in liver trauma is hemorrhage. In hemodynamically stable patients, non- operative management is safe and rewarding. Surgical intervention was found to be lifesaving in thermodynamically unstable patients. The common surgical procedure offered is perihepatic packing and mattress suturing.

Conflict of Interest: There is no conflict of interest to declare by any author about this study.

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