RESEARCH ARTICLE

A PROSPECTIVE STUDY OF CONSERVATIVE MANAGEMENT IN CASES OF HEMOPERITONEUM IN SOLID ORGAN INJURIES AT TERTIARY CARE HOSPITAL IN WESTERN INDIA

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ABSTRACT

Background: Blunt abdominal trauma is one of the most common causes among solid organ injuries. Morbidity and mortality in blunt abdominal injuries is major cause of concern for surgeons.

Aims & Objective: This study was carried out to analyse patient profile, investigations and management of such patients.

Material and Methods: 50 patients, who admitted to civil hospital Surat were studied prospectively. Age and gender distribution, Mode of injury, clinical presentation, solid organs injured, and investigations carried out, length of hospital stay, management – conservative or operative and their outcome were studied.

Results: Out of 50 patients 46 were male, and 4 female patients. 60% patients are from 20-40 year age group. Majority are due to road traffic accidents (54%), and abdominal pain is the most common mode of presentation. Spleen (46%) and liver (38%) are the 2 most common organs involved. 88% patients are managed conservatively, remaining have to undergo laparotomy. Length of hospital stay (1-10 days in 37 patients) is lower patients who are managed by conservative management in comparison to operative management (11-20 days in 4 patients). 54% patients required 1 or more units of blood during hospital stay.

Conclusion: Non penetrating abdominal injuries are major cause of concern. Ultrasonography and CT scan play major role in detecting solid organ injuries. Conservative management is safer and reliable mode of management in solid organ injuries due to blunt abdominal trauma.

KEY-WORDS: Blunt Abdominal Trauma; Hemoperitoneum; Solid Organ Injury; Conservative Management

Introduction

Hemoperitoneum is known as presence of blood in peritoneal cavity. Abdominal trauma is essential culprit for Hemoperitoneum. Abdominal trauma is one of the most common causes among solid organ injuries caused mainly due to road traffic accidents. Motor vehicle accidents account for 75 to 80 % of blunt abdominal trauma.[1] Blunt injury of abdomen is also a result of fall from height, assault with blunt objects, sport injuries, industrial mishaps, bomb blast and fall from riding bicycle.[1]

Several pathophysiological processes take place in a case of non-penetrating abdominal injury. Understanding the mechanisms of injury is crucial in the management of a patient with abdominal trauma. Apart from various abdominal organs, injury to other parts of body also plays part in ultimate outcome of patient.[2] Many a time minor injury can be serious solid organ damage from intra abdominally, such cases should be thoroughly evaluated and managed accordingly.[3]

In spite of the best techniques and advances in diagnostic and supportive care, the morbidity and mortality remains at large. The reason for this could be due to the interval between trauma and hospitalization, delay in diagnosis, inadequate and lack of appropriate surgical treatment, post-operative complications and associated trauma especially to head, thorax and extremities. Other factors which influence outcome in solid organ injuries due to blunt abdominal trauma include hemodynamic instability, associated injuries to other parts of body and Glasgow coma scale.[4]

In view of increasing number of vehicles and consequently road traffic accidents, this study has

been carried out to study the cases of blunt abdominal trauma resulting in Hemoperitoneum in solid organ injuries with reference to the patients presenting at new civil hospital, attached to Government Medical College, Surat with these aims and objectives. To study incidence rate amongst various age group and genders with clinical presentation, extent of involvement of various solid organs, various modes of management including investigations to detect intra-abdominal injuries and outcomes of conservative and operative management and to study various complications associated with solid organ injuries.

Materials and Methods

50 cases of non-penetrating abdominal injuries during the period from July 2008 to November 2010 in New Civil Hospital attached to Government Medical College, Surat were studied prospectively who were admitted in emergency room and then admitted to surgery ward after initial resuscitation.

Inclusion Criteria

1. Hemodynamically stable patient after initial resuscitation with systolic blood pressure of 90 mmofHg or more.
2. Patient with hemoperitoneum having solid organ injury in blunt trauma to abdomen.
3. Patients in age group of 2 to 60 years with no sex preference.

Exclusion Criteria

1. Hemodynamically unstable patient with systolic blood pressure of less than 90 mmofHg despite of resuscitation.
2. Patients with penetrating abdominal injuries.
3. X-ray abdomen standing showing free gas under diaphragm.
4. Four Quadrant Aspiration showing bilious aspirate

After initial resuscitation of the trauma victims, a careful history was taken to document any associated medical problem. Routine blood and urine tests were carried out in all the patients. Documentation of patients, which included, identification, history, clinical findings, diagnostic tests, operative findings, operative procedures, complications during the stay in the hospital and during subsequent follow-up period, were all recorded on a proforma specially prepared. Demographic data collected included the age, sex, occupation and nature and time of accident leading to the injury.

All patients were thoroughly examined after achieving haemodynamic stability. Depending on the clinical findings, decision was taken for further investigations such as four-quadrant aspiration, diagnostic peritoneal lavage, x-ray abdomen and ultrasound. The decision for operative or non-operative management depended on the outcome of the clinical examination and results of diagnostic tests. Patients selected for non-operative or conservative management were placed on strict bed rest, were subjected to serial clinical examination which included hourly pulse rate, blood pressure, respiratory rate and repeated examination of abdomen and other systems. Appropriate diagnostic tests especially ultrasound of abdomen was repeated as and when required.

Apart from routine investigations, abdomen x ray was done in all 50 patients. Ultrasound of abdomen was done in all 50 cases. CT scan was done in 14 patients in our study. As most of our patients were from low socio economic group, it was possible to get CT scan done for only few selected patients. All 50 patients under went four quadrant aspiration. An aspiration of blood, which did not clot, was taken as positive. When the aspirate clotted, the test was taken as negative.

Results

Out of 50 patients enrolled in study, 46 were male while 4 female patients were victims of blunt abdominal trauma. Age distribution is shown in figure 1.

Road traffic accidents are major culprit for solid organ injuries in these patients (54%) followed by fall from height (24%) and assault on victim (14%). Latent period:-more than half patients were brought for treatment within 5 hours of injury while 36% patients were brought for treatment within 24 hours. Most of the patients

included in this study have no associated injuries (62%).in case of associated injuries hemopneumothorax and orthopaedic injuries are associated in the range of 10-12% of patients. More than 95% of patient presented with one or more abdominal symptoms, like abdominal pain, vomiting and/or abdominal distension. Other presentations include haematuria, urine retention, deformity and altered consciousness. Four quadrant aspiration was positive in 22% while it was found to be negative in 78% of patients. Different organs injuries found during ultrasonography is shown in figure 2.

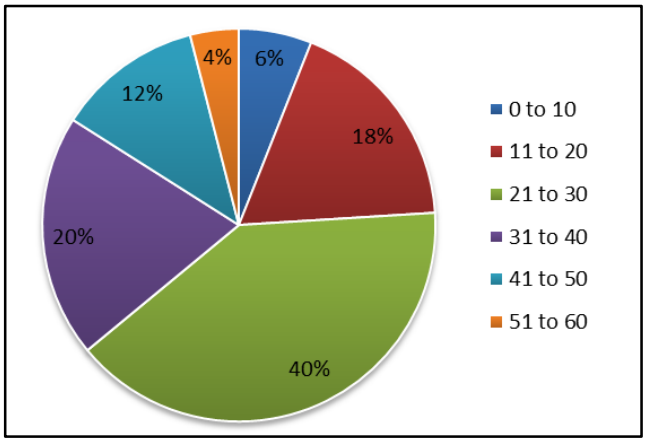

Figure-1: Age Distribution of Blunt Abdominal Trauma Victims

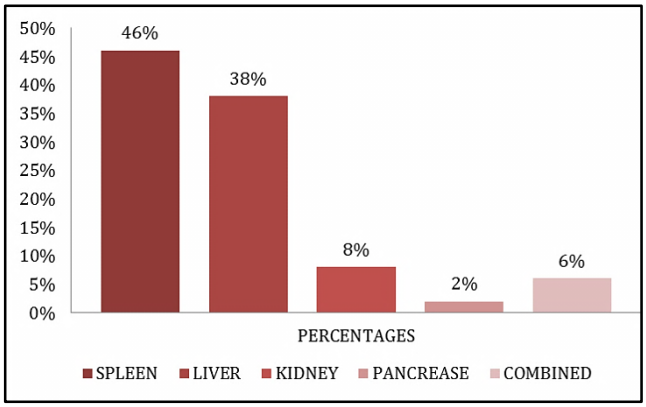

Figure-2: Distribution of Solid Organ Injuries

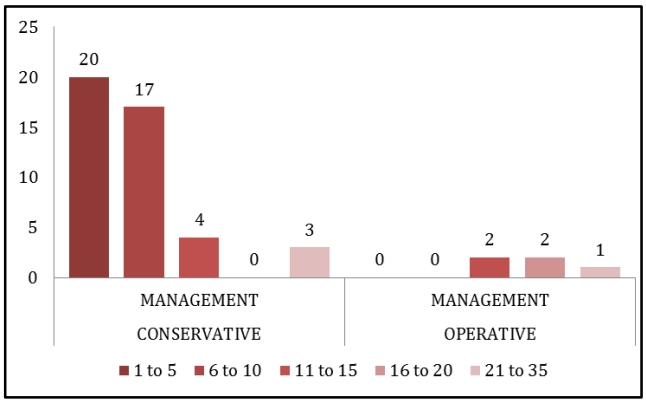

Figure-3: Hospital Stay in Days

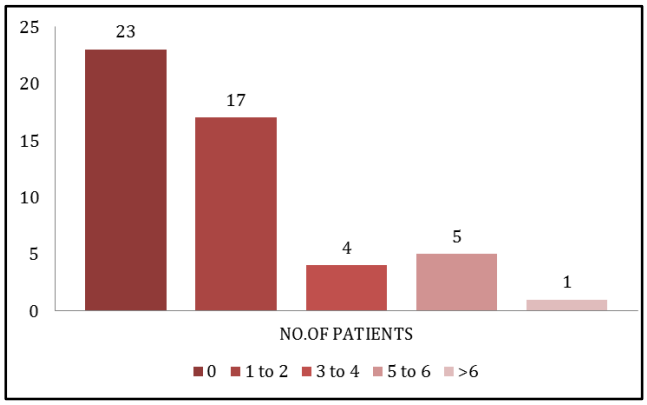

Figure-4: Blood Transfusion Units Required

All patients were managed conservatively, 88% patients were managed successfully by this management while 6 patients have to undergo operative management. Number of days spent in hospital doe to blunt abdominal injury is shown in figure 3.

Discussion

This study consist of 50 patients who have developed solid organ injury due to various causes and brought to New civil hospital, Surat. If we look at the age and sex distribution of patients, in India Male is the major bread winner in society, while females are involved with household duties. More than 90% patients are male and majority of patients belongs to third and fourth decade of life. Similar findings were found in study conducted by Davis et al.[5] Based on these findings it can be concluded that young and productive age group people are usual victims of non- penetrating abdominal trauma. Results of this study clearly show that the road traffic accident is the most common mode of injury. This is due to the rapid development in technology, in all fields including automobile industry where the first priority has been given to speed rather than safety. On comparison with national and international studies road traffic accident forms most common mode of injury, incidence of road traffic as a cause of solid organ injuries in this study matches with that which was found in Indian study conducted by Khanna et al.[6] While Davis et al have found that in western countries road traffic accidents are culprit in nearly 2/3 cases of solid organ injuries which is more that findings of Indian studies.[6] Latent period is time required for patient to transfer for clinical management from time of injury. This time lag is due to the site of accidents,

which are usually rural, and the time taken to transport them to the hospital and is very crucial in management. In our study most of the patients presented within 5 hours of injury, most probably due to improvement in transport and primary health care.

Associated injuries plays major role in management of blunt abdominal trauma as it adds more morbidity and mortality due to wide range of injuries. Majority of patients (62 %) were not having associated injuries while thoracic injuries was found to be involved most often (14%) followed by orthopaedic fracture (12%). Associated extra abdominal injuries were found in 19 cases. The common extra abdominal injuries were extremity fractures, pelvic fractures, head injuries and chest injuries including rib fractures. The above table shows the comparison of the present study incidences of associated injuries with other studies. In previous 2 studies it was found that thoracic injuries were most commonly involved.[5,6]

In the present study, abdominal pain was the most common presenting complaint accounting for 96%. But the signs and symptoms in abdominal injuries are notoriously unreliable and are often masked by concomitant head injuries, chest injuries and pelvic fractures. Significant injuries to the retroperitoneal structures may not manifest signs and symptoms immediately and be totally missed even on abdominal x-rays and DPL predisposing the patients to grave consequences of missed injuries. In Davis et al study, 43% of patients had no specific complaints and no signs or symptoms of intra-abdominal injury when they first presented to the emergency room. But 44% of those patients eventually required exploratory laparotomy and 34% of patients had an intra-abdominal injury. This emphasizes the importance of careful and continuing observation and repeated examination of individuals with non-penetrating abdominal trauma.

Four quadrant aspiration is an easy method of diagnosing hemoperitoneum in doubtful cases. However, negative result does not rule out hemoperitoneum. In the present study, all 50 patients were subjected for four quadrant aspiration as against 44% in Davis et al[5] study. 22 cases were found to be positive and 39 cases were negative.

All 50 patients were subjected for ultrasound examination, out of which only one had missed solid organ injury that required CT scan of abdomen. Therefore ultrasound is more reliable in detecting solid organ injuries and free fluid in the abdomen. Emergency ultrasonography was found to be highly accurate and reliable mode of detecting solid organ injuries and hemoperitoneum.[7] In this study, the in non - penetrating abdominal injuries detected by ultrasound is about 94.6 %. Spleen (46%) was the most common organ to be detected on ultrasonography of abdomen followed by liver (38%), kidney (8%). Isolated pancreatic injuries are very rare and accounted only for 2% of patients. Combined injuries were found in 6% of patients. Spleen (46%) was the most common organ to be detected on ultrasonography of abdomen followed by liver (38%), kidney (8%). Isolated pancreatic injuries are very rare and accounted only for 2% of patients. Combined injuries were found in 6% of patients. In previous studies it was found that spleen and liver are 2 most common organs injured during blunt abdominal trauma.[3,5.6,11,12]

In present study 88% of patients were successfully managed with conservative management and 12% of patients eventually require laparotomy. Laparoscopy was found to be more effective and safe in comparison to open surgeries in hemoperitoneum with solid organ injuries in patients of blunt abdominal trauma.[8] Increased trend towards conservative manage-ment is also reflected in other studies.[5,9,10] This was due to earlier trend of operative management due to unavailability of better imaging and risk of missed injuries. Non operative management is gaining increasing acceptance mainly because of the easy availability of better imaging modalities like Ultrasound and CT scan. With the aid of CT scan it is possible to accurately grade the extent of injury to solid organs like liver and spleen. Minor lacerations and capsular tears, difficult to diagnose clinically can be easily demonstrated by CT scan and selected for non-operative management.

Conservative management continues to have high success rate and with reduction in number of days for hospital stay in comparison to operative management.[6] Majority of patients who were treated conservatively had hospital stay of 1 – 5 days. The average duration of stay in conservative management was 6.5 days while in operative management it was 16.7 days. As seen above conservative management decreases the hospital stay hence morbidity. 19 out of 50 patients had associated injuries, which might have contributed to length of hospital stay.

Blood transfusions were given to 27 of the 50 patients during their hospital stay. No patient in our series was felt to have on-going haemorrhage from the injured organ requiring transfusions. The associated injuries that likely contributed to blood loss in transfusion group were mainly hemothorax, fracture pelvis, and extremity fractures.

Conclusion

Non-penetrating trauma abdomen is a major cause of morbidity and mortality in young and economically productive age-group. Road traffic accident is the major causative agent. Availability of emergency resuscitation and trauma care services, especially near highways helps in lowering the mortality. With investigations like ultrasonography and computed tomography scan, there is a paradigm shift in the management of non-penetrating trauma abdomen from operative to non-operative mode. Conservative line of management is safe and effective in a hemodynamically stable patient without any signs of peritonitis.

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