AN EXPERIENCE WITH MANAGEMENT OF HEMOPERITONEUM IN BLUNT INJURY OF ABDOMEN AT TERTIARY CARE CENTER OF WESTERN NEPAL

Santosh Mishra,[1] Kailash Chandra,[1] Kumar Paudel[1]

ABSTRACT

INTRODUCTION

Blunt abdominal trauma results in huge burden of morbidity and mortality among all age groups caused mainly by road traffic accident, fall from height and physical assault. This study was designed to evaluate the outcome of management of hemoperitoneum in blunt injury of abdomen.

MATERIAL AND METHODS

This is a prospective observational study involving 100 cases of blunt abdominal injury during the period from 1st December, 2014 to 13th March 2016 in UCMS-TH, Bhairahawa, Nepal. Documentation of the patients which included identification, history, clinical findings, diagnostic tests, operative findings, operative procedures, complications during hospital-stay was done. The decision regarding operative or non- operative management was made by specialist surgeon.

RESULTS

The majority of the patients belonged to 21- 30 years age group. 72 cases were male while 28 were female. 93 patients were managed conservatively while 7 patients were operated. Most common mode of injury was road traffic accident (RTA) (74%) followed by fall form height (20%). Most common organ to be injured was spleen (65%) followed by liver (26%). 93 % patients underwent non-operative management while 7 % were operated. Mortality rate was 0% among the non-operative and 14.29% in operative cases.

CONCLUSION

Non operative management in patient with hemoperitoneum with regular monitoring of vitals and repeated clinical assessment can reduce the operative need , morbidity and length of hospital stay. Non-operative Management (NOM) for blunt abdominal injuries was found to be highly successful in 93% of the patients in this study.

KEY WORDS Blunt abdominal tauma, hemoperitoneum, non operative management

1. Department of Surgery, Universal College of Medical Sciences, Bhairahawa, Nepal

DOI: https://doi.org/10.3126/jucms.v7i1.24689

For Correspondence
Dr. Santosh Mishra
Department of Surgery
Universal College of Medical Sciences
Bhairahawa, Nepal
Email: mishra.santoshucms@gmail.com

INTRODUCTION

Blunt abdominal trauma is a major cause of emergency hospital visit in developing countries and the leading cause of morbidity and mortality in under 45 years age group.[1] Splenic injury and liver injury accounts for 40% and 20% of abdominal organ injuries respectively causing hemo-peritoneum.[2-3] Abdominal injuries require surgery in about 25% of cases while the patients who are hemodynamically stable can be managed conservatively with close monitoring.[4] Patients with deteriorating clinical signs when they are being managed non-operatively should go operative management.[5]

There has been increasing trend towards non operative management (NOM) of blunt trauma amounting to 80% of the cases with failure rates of 7-8%. Pre-hospital transportation, initial assessment, thorough resuscitative measures and correct diagnosis are of utmost importance in trauma management.[6]

In Nepal, trauma- related injury contributes significantly to morbidity and mortality, and is the third leading cause of death.[7] The objective of this study was to assess the outcome of management of hemoperitoneum in blunt injury abdomen.

MATERIAL AND METHODS

Study design and participants

A prospective observational study spanning a year and half was performed and 100 patients with blunt abdominal trauma who presented to emergency department of Universal College of Medical Sciences-Teaching Hospital, Bhairahawa during Dec 1st 2014 to 13th March 2016 were studied. However, patient with penetrating injuries (stab or gunshot injuries) were excluded.

Method of collection of data

All patients were assessed in accordance with ATLS (Advance trauma life support) protocol. Detailed history including mechanism, mode and site of injury formed an important part of evaluation. Mechanism of injury was defined as a road traffic accident (RTA) or non - RTA. Patients were categorized to stable *vs* unstable. Patients with (Heart Rate) HR< 100/ min, systolic (blood pressure) BP> 90 mm Hg on arrival or following initial resuscitation, were considered stable. All patients underwent FAST (focussed assessment with sonography for trauma) scan, X ray chest. Unstable patients were further evaluated with chest abdomen and pelvis CT scan. Isolated organ injury (liver, spleen, kidney), multiple solid organ injury, extra- abdominal injuries were recorded. The severity of other associated injuries like orthopedic injury or multiple solid organ trauma were not considered as an exclusion criteria in hemodynamically stable patients.

Non operative management of unstable patients involved admission to ICU (intensive care unit), close monitoring with repeated clinical assessments. Pulse, BP, temperature, respiratory rate, urine output, hemoglobin, hematocrit, abdominal girth for the first 72 hours were assessed and recorded. Follow-up ultrasonography of abdomen or CT scan were done if hemoglobin dropped despite 3 units of blood transfusion, progressive distension of abdomen, tachycardia, signs of infection, vomiting, tachypnea.

Stable patients were admitted in surgical ward monitored with cardiac moniter device and pulse oximeter. In our study, there was not a cut- off hematocrit value and therefore, transfusion was rather empirical.

Patient who required transfusion in the first hour were kept under observation and the need for further transfusion was evaluated during the period of next 48 hours. The attending surgeon was in- charge concerning patient's management. No patient from this series was transferred to a higher level trauma centre. All data were analysed by Statistical Package for Social Sciences (SPSS), USA v20. Categorical data were represented by frequency (%), bar- diagrams and pie- charts. Continuous data were expressed in terms of mean ± S.D. The chi- square test was done to see the association. The p- value of 0.05 was set up as level of significance.

RESULTS

Demographic profile

We included 100 blunt trauma patients (72 male and 28 female) with median age of 28 years. The most common age group involved was 21-30 years (27%) (Figure 1).

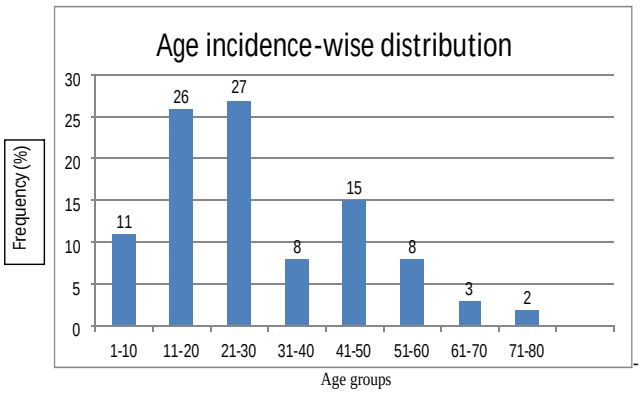

Figure 1. Bar diagram showing frequency (%) distribution of age groups in cases

The majority of the mode of injury was road traffic accident accounting 74% followed by fall from height with frequency of 20% (Figure 2).

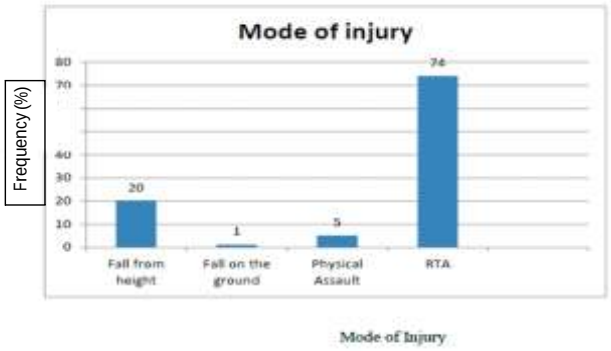

Figure 2. Bar diagram showing frequency (%) distribution of mode of injury

The associated extra abdominal injuries were found in 34 cases out of 100. The maximum associated extra abdominal injury was seen in thoracic with frequency of 16% followed by head injury in 9% (Figure 3).

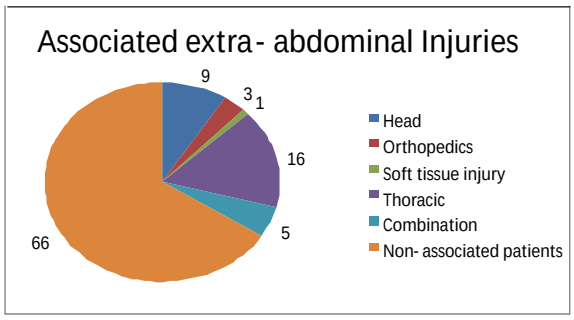

Figure 3. Pie chart showing frequency (%) of patients with associated injuries

The frequency (%) distribution of abdominal x-ray findings showed ground glass opacity in 89% cases, followed by gas under diaphragm in 8% cases. Enlarged soft tissue shadow was present in only 3 % cases.

Out of all patients subjected to ultrasound examination, 100% were with free fluid with solid injury followed by 65% with splenic injury and 30 % with liver injury respectively. (figure: 4)

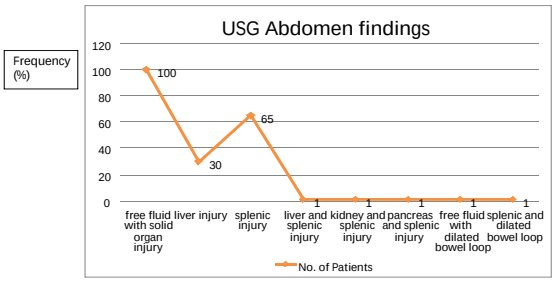

Figure 4. Line chart showing frequency (%) of patients with different types of USG findings

The most common abdominal CT finding was splenic injury with frequency 65% followed by liver injury in 26% cases (figure: 5)

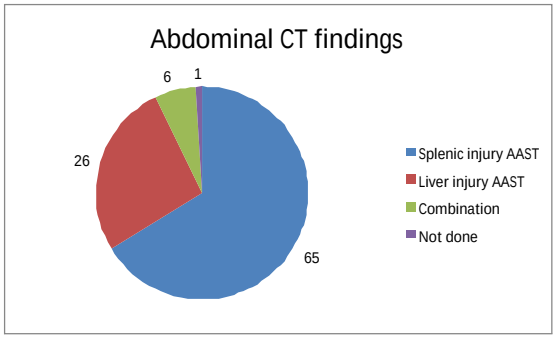

Figure 5. Pie chart showing abdominal CT findings

Multiples organ injuries which was present only in 5% cases with 1% case in each multiple organ injuries as shown in the pie chart (Figure 6).

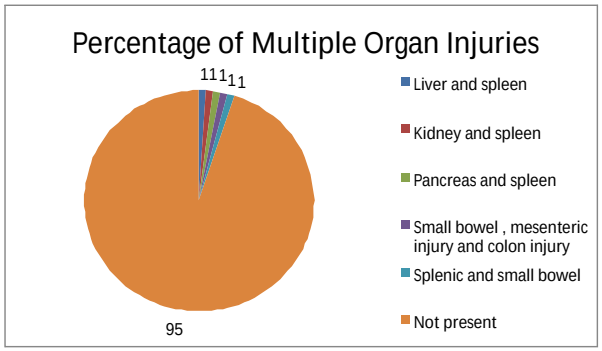

Figure 6. Pie chart showing frequency (%) of patients with multiple organ injuries.

Out of 100 cases, 93 were treated conservatively i.e, non-operative procedure while remaining 7 were underwent operative procedure.

The most common operative procedure was resection and anastomosis of ileum with frequency 71.43% followed by primary repair of jejunal perforation and MGPR of duodenal perforation with frequency of 14.29% each. The total mortality was only one found following operative procedure with frequency 14.29% while 6 cases i.e, 85.71% that underwent operative procedure shows improvement. On contrast conservative procedure shows 100% improvement.

DISCUSSION

Sir McCormack in 1900 was the first to advocate "A man wounded in war in the abdomen dies if he is operated upon and remains alive if he is left in peace".[8] This dictum was a surgical doctrine to manage abdominal trauma in the war-field during

early 20th century. This practice went into oblivion due to dogma of mandatory laparotomy in every case of hemoperitonium.[8] The advent of newer imaging techniques with high resolution CT scanners has enabled the clinicians to exactly diagnose the extent of intra-abdominal organ injury.[9] With the publication of many reports of success during the last 20 years, NOM has become an established and accepted management protocol for solid organ injuries in hemodynamically stable patients.

In our study, the mean age group was 29.59 years. Majority of them are in the age group 21- 30 years which constitutes 27% of the total cases followed by 11- 20 years which constitutes 26% of the total cases which is in accord to study by Allen RB et al.[10] The male to female ratio was 2.57:1 in our series while it was 7.5:1 in Dauterive et al.[11] Allen R.B. and Clury CJ (1957) had male, female ratio 3:1.[10] Mehta et al. found the male, female ratio to be 3.76:1.[6] Thus, above findings were suggestive of injuries being common in males around 20 to 30 years of age suggesting the active group.

The most common mode of injury was RTA (Road Traffic Accident) accounting for 74% of total cases which is similar to findings in other study.[6,10,11]

In this study, the maximum cases were having injury in left hypochondrium with frequency 42% followed by right hypochondrium with frequency 37% respectively. The commonest hollow organ injury was small bowel perforation and the most common bowel injured was jejunum.

Out of 100 patients, 66 cases were not associated with any extra abdominal injury. The most common associated injury was thoracic with frequency of 16% followed by head injury in 9%. The common associated extra-abdominal injuries included chest (35%), musculo skeletal (32%), and head injury (24%) in the study conducted by Arumugam S et al.[12] One hundred-twenty (27%) of the 437 patients had blunt chest trauma in case of JJ Davis series.[13]

In our study, x-ray abdomen was done in all 100 cases. Ground glass opacity was found in 89 cases followed by gas under diaphragm seen in 8 cases. All 100 patients underwent USG abdomen / pelvis. Ultrasound examination revealed 99% were with free fluid in abdomen without any solid organ injury followed by 65% with splenic injury and 30 % with liver injury respectively. CT abdomen revealed 65 cases to have splenic injury followed by 26 cases of liver injury. Most common organ to be injured was spleen. Commonest intra abdominal injury was splenic injury in 53% followed by liver injury in Mehta et al. series. [6] These results were consistent with findings from JJ Davis series.[13]

In this study, multiples organ injuries which was present only in 5% cases. 93 % patients were subjected to non-operative management while 7% under went different operative procedures. Among those who underwent operative procedures, the most common operative procedure was resection and anastomosis of ileum with frequency 71.43% followed by primary repair of jejunal perforation and MGPR of duodenal perforation with frequency of 14.29% each. The post-operative outcome included fever was seen in 10% cases followed by chest infection in 5% of cases. Wound infection (3.8%), pneumonia (3%), and urinary tract infection (1.4%) were the frequently observed complications in Arumugam S et al. series. [12] In case of non- operative management, the failure rate was 0 % ie. 93 patients who were managed conservatively, all survived. But, in cases in which operative procedures were undertaken, 1 out of 7 cases expired ie. with mortality rate of 14.29 % in operated cases. In the study conducted by JJ Davis et al.[13] 269 cases were operated among whom 40 deaths occurred resulting in mortality rate of 14.8% in operated case. In the same series, 3 out of 153 patients who were managed non- operatively died amounting to 2% mortality rate. NOM for blunt abdominal injuries was found to be highly successful in 89.98% of the patients in study conducted by Raza et al.[14]

CONCLUSION

Road traffic accidents form the most common mode of injury. Males are predominantly affected. Spleen is the most common solid organ to be injured in case of BAT followed by liver injury. The most common extra-abdominal injury was thoracic injury followed by head injury. Thorough clinical examination and investigations like X- Ray, ultrasonography and CT Scan play valuable role in the management of blunt injury of abdomen. Non-operative management of hemoperitoneum in case of blunt injury of abdomen was found to be highly successful and safe in our analysis.

CONFLICT OF INTERESTS

The authors declare there is no conflict of interests.

REFERENCES

1. Van der Vlies CH, Olthof DC, Gaakeer M, Ponsen KJ, van Delden OM, Goslings JC. Changing patterns in diagnostic strategies and the treatment of blunt injury to solid abdominal organs. International Journal of Emergency Medicine. 2011;4 :47. doi:10.1186/1865-1380-4-47.
2. Novelline RA, Rhea JT, Bell T. Helical CT of abdominal trauma. Radiol CLin North Am 1999;37:591-612
3. Shanmunganathan K. Mirvis SE. CT evaluation of liver with acute blunt trauma. Crit Rev Diagn Imaging 1995; 36:73-113
4. Ahmet K, Tongue Y. Blunt abdominal trauma: evaluation of diagnostic options and surgical outcomes. Turkish J Trauma Emerg Surg 2008;14:205-10.
5. Schroeppel TJ, Croce MA. Diagnosis and Management of blunt abdominal solid organ injury. Current Opinion in Critical Care. 2007;13(4):399-404.
6. Mehta N, Babu S, Venugopal K. An Experience with Blunt Abdominal Trauma: Evaluation, Management and Outcome. Clinics and Practice.2014;4(2):599. doi:10. 081/cp.2014.599.
7. A Bajracharya, A Agrawal , BR Yam, CS Agrawal, and Owen Lewis: Spectrum of surgical trauma and associated head injuries at a university hospital in eastern Nepal J Neurosci Rural Pract. 2010 Jan-Jun; 1(1): 2-8.
8. McCormack. J. Royal Soc. Medicine. 84. Derbyshire Royal Infirmary Derby DEI 2 QY:555 JDC Bennett FRCS DCH Department of ENT; 1991.
9. Deunk J, Brink M, Dekker H, et al: Predictors for the selection of patients for abdominal CT after blunt trauma: a proposal for a diagnostic algorithm. Ann Surg 2010,251(3):512-520.
10. Allen RB and Curry CJ : Abdominal trauma; A study of 297 conservative cases. Ann. Surg 1957; 93: 398-404
11. Dauterive AH, Flancbaum L, Cox EF. Blunt intestinal trauma, A modern day review. Ann Surg., 1985; 201: 198-203.
12. Arumugam S, Al-Hassani A, El-Menyar A, et al. Frequency, causes and pattern of abdominal trauma: A 4-year descriptive analysis. Journal of Emergencies, Trauma, and Shock. 2015; 8(4):193-198. doi:10.4103/09742700.166590.
13. Davis JJ, Cohn I, Nance FC. Diagnosis and management of blunt abdominal trauma. Annals of Surgery. 1976;183(6):672-678.
14. Raza M, Abbas Y, Devi V, Prasad KVS, Rizk KN, Nair PP. Non operative management of abdominal trauma a 10 years review. World Journal of Emergency Surgery: WJES. 2013;8:14. doi:10.1186/1749-7922-8-14.