



Prospective Study Of Safety And Outcome Of Non Operative Management In Cases Of Blunt Injury Abdomen In A Tertiary Care Hospital

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Abstract

Background : Blunt injury to abdomen is the commonest injury caused by road traffic accidents. Abdominal injuries occur in 31% patients of polytrauma with 13% of spleen , 16% of liver injuries and pelvic injuries in 28% of cases, making differential diagnosis between the abdominal injury or pelvic difficult. .The haemodynamically unstable patients with frank signs of shock should undergo laparotomy. Over the past two decades, major shift has happened from operative to selective Non operative management of traumatic injuries. The increased use of Non operative management of abdominal solid organ injuries is facilitated by highly accurate non invasive newer imaging techniques with high resolution CT scanners, trauma protocols and interventional radiology units. Accurate interpretation of these radiographic images, as well as the ancillary services gives us an excellent replacement to serial physical examination. The Non operative management of solid abdominal organ injuries is now well established for haemodynamically stable patients. The present study is a prospective one to evaluate the outcome of non-operative management of blunt trauma of abdominal solid organs in a Tertiary Care Centre- Coimbatore Medical College.

Materials And Method The prospective observational study was conducted in the Tamil Nadu Accident and Emergency care Initiative (TAEI) ward of Coimbatore medical college hospital. 100 patients who presented with blunt abdomen trauma (considering the inclusion and exclusion criteria) were included in the study. All patients who satisfy the inclusion criteria were made to undergo a Primary Survey and the patients was examined in the following manner. • General physical examination • Abdominal examination .Investigations

Results : Of the 100 patients taken up for study 91 were managed conservatively and 9 patients were taken up for surgery. Among those 9 patients 7 were operated on the day of surgery and 2 patients were observed conservatively and due to unstable vitals were converted to operative management on post trauma day 2. From our study it was observed that the patients with grade 1 and 2 injuries were managed conservatively with better clinical outcome and lesser morbidity. While the treatment option for grade 3 injuries mainly depends on the hemodynamic status of the patient, the patients with Grade 4 and 5 Injuries usually presented with hemodynamic instability in which case laparotomy is mandatory.

Conclusion :

Among the solid organs, spleen is the commonest organ involved followed by liver with good clinical outcome.. Serial clinical examination and blood investigation done in patient in non operative management. Patient in non operative management deteriorating clinically with developing hypotension ,tachycardia and significant abdominal findings should be resuscitated and Operated. Hence in a blunt injury of abdominal solid organs the

Non operative management has significantly reduced the morbidity following unnecessary laparotomy with advent of good imaging and clinical examination.

Keywords: Blunt Abdominal Injury, Non operative management, Liver and splenic injuries, resuscitation, intra-abdominal haemorrhage, trauma

Introduction

In 1900, Sir McCormack was the first to say, "A man wounded in war in the abdomen dies if he is operated on, but lives if he is left alone." This aphorism was a surgical theory used in the early twentieth century to treat abdominal wounds in the battlefield. Due to the dogma of necessary laparotomy in every case of hemoperitonium, this practise faded away. In the mid-1980s, patients who had sustained blunt trauma were evaluated as follows: All patients were evaluated at the outset, and those who were hemodynamically stable underwent diagnostic peritoneal lavage (DPL). The major diagnostic tool was a CT scan. • If a patient refuses Diagnostic Peritoneal Lavage, • Have had substantial abdominal surgery in the past, or • More than 12 hours have passed after the injury.

High resolution CT scans have now enabled clinicians to precisely diagnose the extent of intra-abdominal organ injury identification, classification, and treatment based on the findings has improved over the last 20 years due to the advent of newer imaging techniques. The accurate interpretation of these radiographic images, along with the ancillary services, provides us with an excellent substitute for serial physical examination. For haemodynamically stable patients, the Non operative management of solid abdominal organ injuries is now well established unlike the olden era.

Aims And Objectives:

Aim Of The Study: 1. To evaluate the outcome of non-operative management in blunt abdominal

trauma, 2. To analyze the criteria for conversion to operative management, and 3. To identify the organ with best outcome in non-operative management.

Objectives: Primary Objectives: • To determine the outcome of non-operative management in a patient presenting with blunt abdominal trauma.

Secondary Obejectives: • To determine the relationship between the organ injured and the outcome of non operative management in a patient with blunt abdominal trauma.

Materials And Methods:

Study design: Prospective observational study

Study population: The study population comprises of adult patients of either sex aged above 18 yrs presenting to the trauma care unit with history of blunt abdominal injury in Coimbatore medical college hospital, for a period of 1 year. Sample size: Total study sample size – 100

Inclusion criteria: a. All Patients above 18 years with non – penetrating blunt abdominal trauma b. Patients with blunt injury abdomen who are haemodynamically stable

Exclusion criteria: 1. Patient refusal 2. Age.

Results:

The collected data were analysed with IBM.SPSS statistics software 23.0 Version. Data are presented as percentages and the number of cases. Categorical data were analyzed with Pearson chi-square tests. Significance was defined by P values less than 0.05 using a two-tailed test.

AGE DISTRIBUTION

Age distribution		
	Frequency	Percentage
Upto 20 years	2	2.0
21 - 30 years	15	15.0
31 - 40 years	28	28.0
41 - 50 years	33	33.0
51 - 60 years	15	15.0
Above 60 years	7	7.0
Total	100	100.0

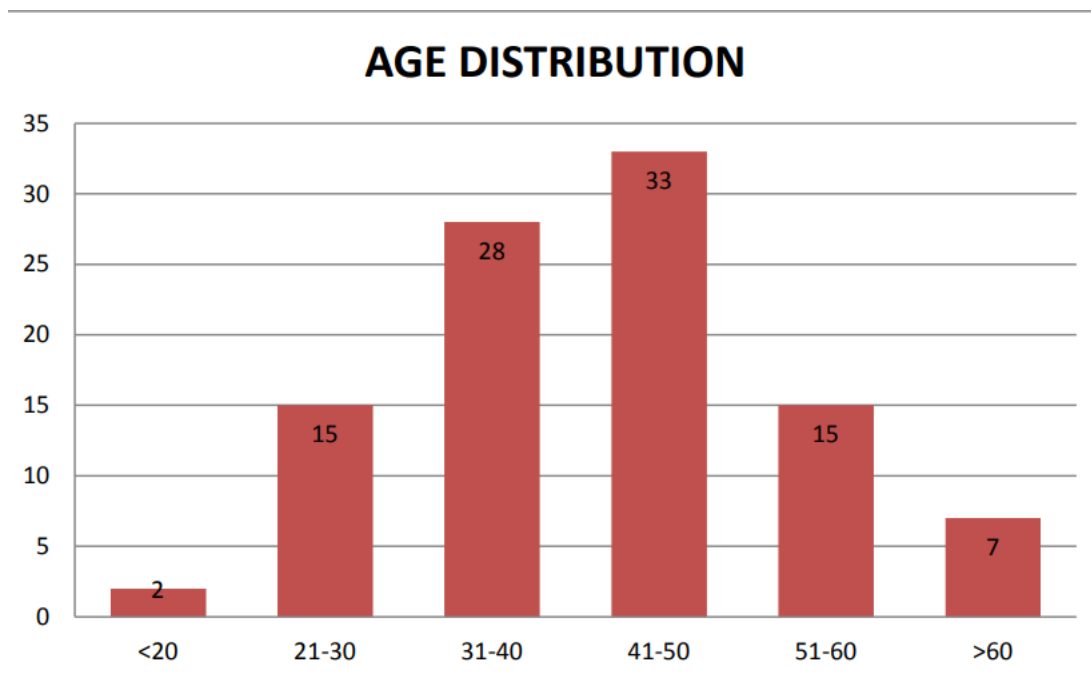
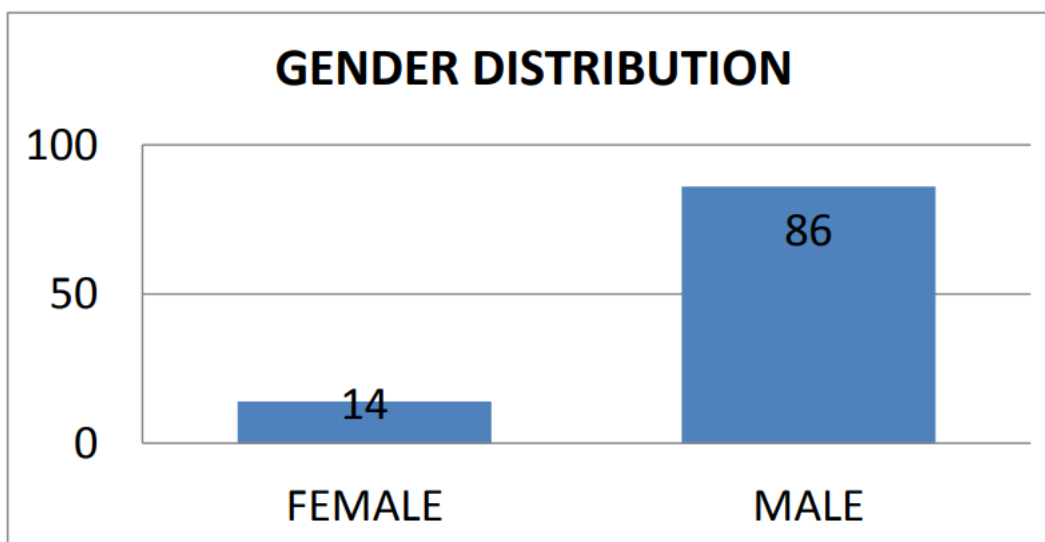


Chart 1 AGE DISTRIBUTION The above table shows Age distribution were 2 people below 20 years of age, 15 in 21-30 years age group, 28 in is 31-40 years, 33 in 41-50 years, 15 in 51-60 years, and 7 members were above 60 years of age. The most common age group involved id between 41-50 years of age contributing 33%.

GENDER DISTRIBUTION

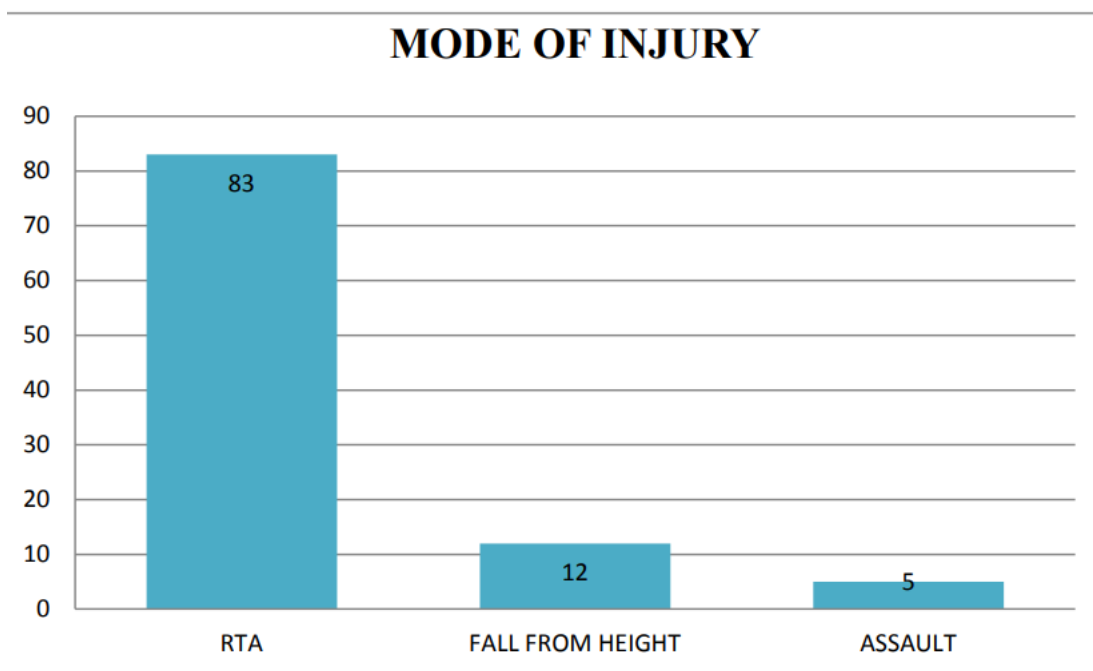
Gender distribution		
	Frequency	Percent
Female	14	14
Male	86	86
Total	100	100.0



The above table shows Gender distribution were 14% are Females, 86% are Males

Table 6: MODE OF INJURY DISTRIBUTION

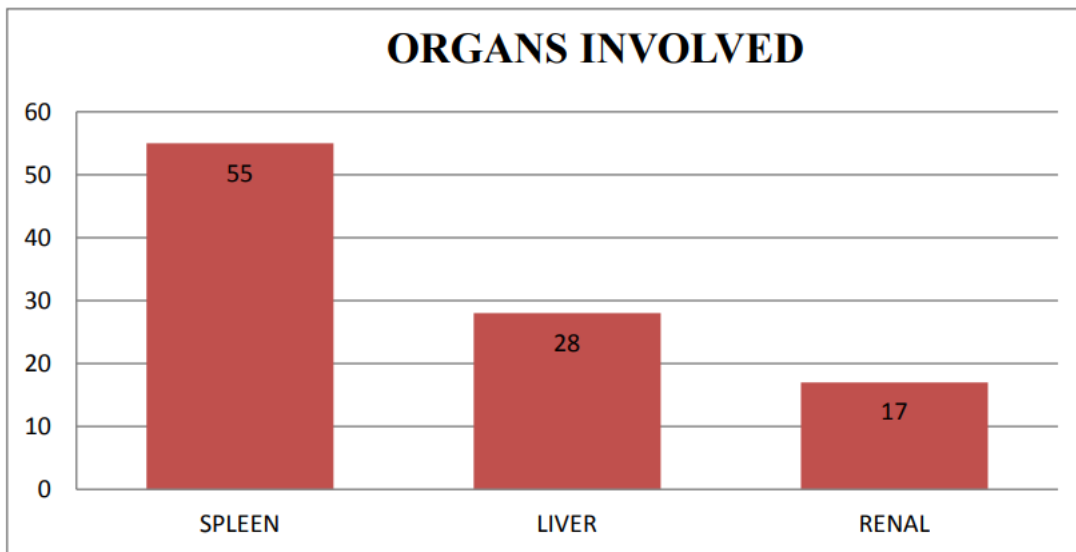
Mode of injury		
	Frequency	Percent
RTA	83	83.0
FALL FROM HEIGHT	12	12.0
ASSAULT	5	5.0
Total	100	100.0



The above table shows Mode of injury distribution were 83.0% is RTA, 12.0% is Self fall and 5% is from assault

TABLE 7: ORGAN INVOLVEMENT DISTRIBUTION

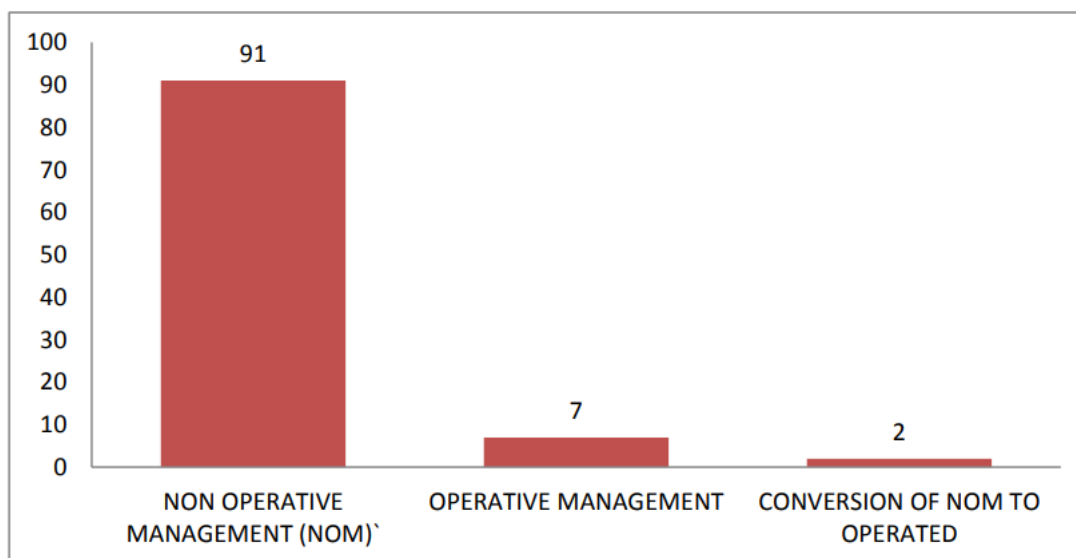
Organ Involvement Distribution		
Organs	Frequency	Percentage
Spleen	55	55.0
Liver	28	28.0
Kidney	17	17.0



Among the 100 patients with blunt abdominal injury, 55% and 28% of them had splenic and liver involvement respectively. whereas 17 % of the patients had renal involvement. The most common organ involved being spleen with the highest percentage of 55%.

Table 14: DISTRIBUTION OF LINE OF MANAGEMENT

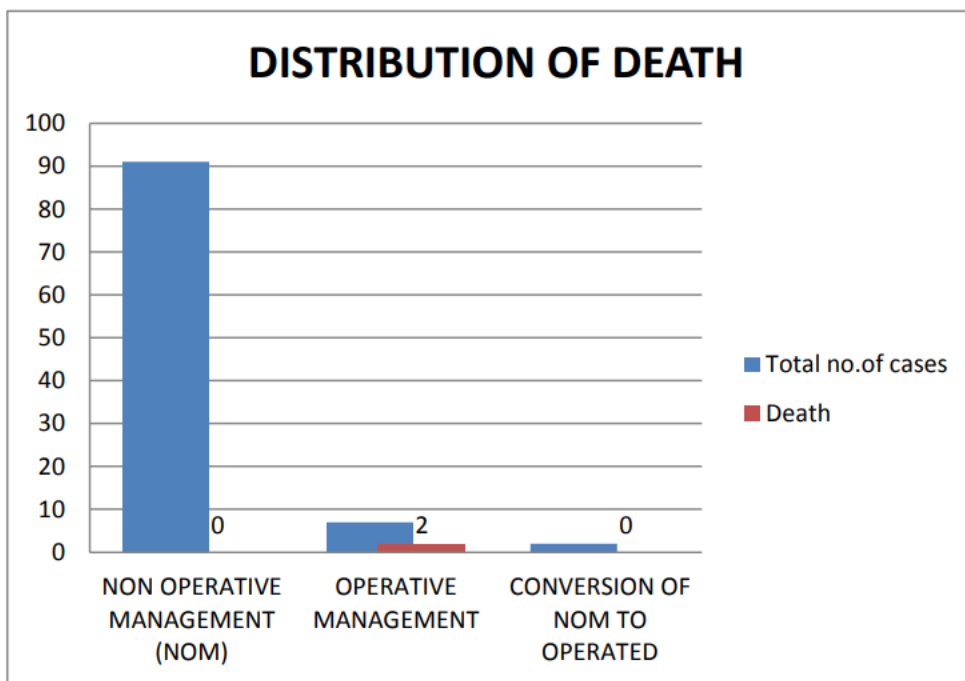
Distribution of line of management		
	Frequency	Percent
NON OPERATIVE MANAGEMENT (NOM)	91	91%
OPERATIVE MANAGEMENT	7	7%
CONVERSION OF NOM TO OPERATED	2	2%
TOTAL	100	100%



The above table shows distribution of line of management where 91% of the patients were treated non operatively, whereas 7% were operated 2% were initially managed conservatively but later converted to operative management.

Table 15: DISTRIBUTION OF DEATH

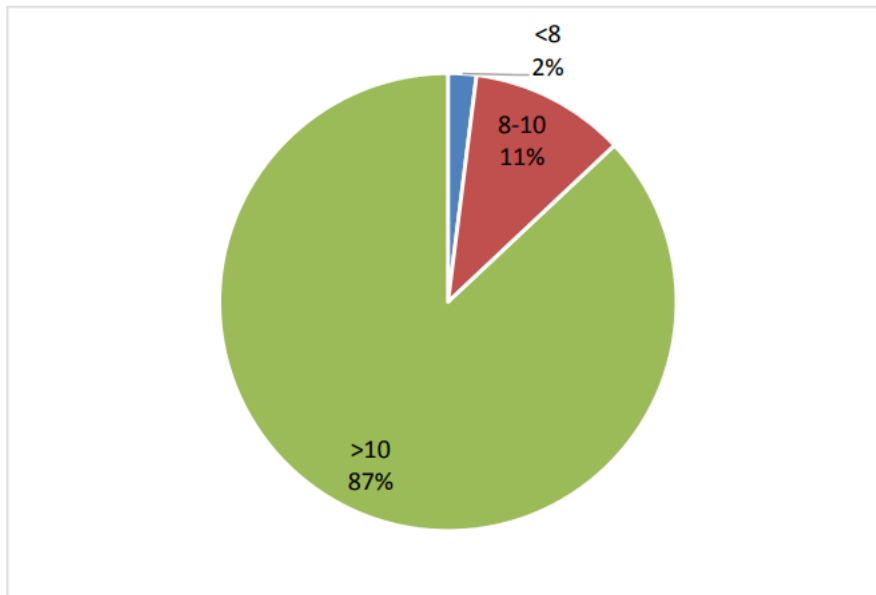
Distribution of death		
	Total no.of cases	Death
NON OPERATIVE MANAGEMENT (NOM)	91	0
OPERATIVE MANAGEMENT	7	2
CONVERSION OF NOM TO OPERATED	2	0
TOTAL	100	2



The above table depicts the distribution of death among our study population , where 2 deaths were noted in the operatively managed group, where as there were no death reported among the non operatively managed and the converted groups.

Table 16: DISTRIBUTION OF HAEMOGLOBIN VALUE

Hb	Frequency	Percent
<8	2	2.0%
8-10	11	11.0%
>10	87	87.0%



The above table depicts the distribution of haemoglobin values, where majority of the patients(87%) had haemoglobin value above 10 g/dl while 11% of them were between the range of 8 to 10 g/dl. 2 % of the study population had values less than 8%.

Discussion:

Blunt abdominal injury have detrimental effects on all abdominal solid organ systems. It is a well-recognized entity related to high morbidity and mortality rate; recognizing patients at risk, monitoring the haemodynamic status frequently and choosing the correct mode of treatment could reduce the mortality to a significant level. This study is an attempt to study the safety and outcome of the patients of blunt abdominal injury of solid organs treated with the non-operative management (NOM) and operative management respectively. While analyzing the data, the most common age group involved in blunt abdominal trauma is between 41 and 50 years old, accounting for 33% of all participants. There were 2% people under the age of 20, 15% people between the ages of 21 and 30, 28% people between the ages of 31 and 40, 33% people between the ages of 41 and 50, 15% people between the ages of 51 and 60, and 7% people over the age of 60years. With the majority being males 86% than the females 14%. The commonest mode of injury being RTA(83%),12% had self-fall, and the remaining 5% had assault. The spleen is the most commonly involved organ, accounting for 55% of all cases. 28 percent of the 100 patients with blunt abdominal injury had liver involvement. Where as renal involvement was present in 17% of the patients. 77 Among the 55 patients with splenic injury, he

distribution of grades were 3.60 % AAST grade 1, 70.9 % AAST grade 2, 18% AAST grade 3, and 7.2% AAST grade 4 splenic injury. AAST grade 2 contributed the greatest percentage. And the distribution of conversion in splenic injury shows that one of the ten cases(10%) of AAST grade 3 splenic injury was converted to splenectomy. This patient was monitored conservatively until post-trauma day (PTD) 2, but splenectomy was performed on PTD 2 due to unstable vitals. In contrast, all four cases of AAST grade 4 were operated (100%). The distribution of liver injury grades were, 7.1 % belong to AAST Grade 1, 58.6 % and 28.5 % belong to AAST Grades 2 and 3, respectively, and 10.1 % belong to AAST Grade 4 liver injury. AAST Grade 2 being the most common, accounting for 58.6 % of all grades. Among the 28 cases of liver injury of various grades the rate of conversion is noted in AAST Grade 4 injury, where all three cases have been taken up for surgery, . And, of those three cases, two were taken to surgery right away, while the third was initially managed conservatively for two days before being taken to surgery on posttraumatic day two due to unstable vitals. Among the 17 patients with renal injury none of the them had AAST grading 1, 76.5 % had AAST grading 2, 17.6 % had AAST grading 3 and 5.9 % had AAST grading 4 respectively. None of the AAST grades 1, 2, or 3 were converted but the only patient with AAST grade 4 was converted to

operative management, indicating a 100% conversion rate in this group. 78 91 out of 100 patients were managed conservatively and none of these patients expired. where as 7 were operated immediately and 2 were initially managed conservatively but later converted to operative management. 2 deaths were noted in the operatively managed group, where as there were no deaths were reported among the non operatively managed group. Haemoglobin value, blood pressure and pulse rate were taken as indicators of haemodynamic status of the patients at the time of admission and were compared with the mode of management and deaths. The results were; haemoglobin values of the patients were divided into 3 groups; 10 g/dl. Among the 100 patients of our study population 2% had Hb 10 g/dl. And the 2 patients with Hb < 0.0001 which denotes statistical significance between the haemoglobin value and the mode of management and deaths respectively. While the blood pressure is being accounted, 9 patients had BP of less than or equal to 100 mmHg (9%) and the remaining 91 patients had BP more than 100 mmhg (91%). And among those 9 patients with BP ≤100 mmHg, all 9 79 were operated (100%) and 2 were reported dead (22.2%). While those 91 patients with BP of more than 100 mmHg, all of them were managed conservatively with non operative management and none were reported dead. The P value of these being < 0.0001 which denotes statistical significance between the BP and mode of management and death respectively. The distribution of pulse rate were 11% had pulse rate of ≥ 100/min and the remaining 81% had a pulse rate of above 100/min. and among those 11 patients with pulse rate ≥ 100/min, 9 were operated and 2 were reported dead. while in the 81 cases with pulse rate more than 100/min all patients had conservative with non operative management and none were reported dead. the P value being < 0.0001 which implies the statistical significance of the pulse rate being a variable correlated to the mode of management and death respectively.

Conclusion:

In our study, it was observed that road traffic accidents were the most common cause of blunt abdominal trauma and the most commonly involving age groups between 41-50 years. Males who have suffered blunt abdominal trauma outnumbered females. Among the solid organs, spleen is the

commonest organ involved followed by liver with good clinical outcome. In a significant number of cases, as previously stated, a conservative Non operative management is preferred over surgical treatment because it is both safer and effective if followed prudently. Conservative management should be followed wherever possible as the morbidity and mortality associated with operative management is significantly higher especially in patients who presented with haemodynamic instability. Serial clinical examination and blood investigation done in patient in non operative management. Patient deteriorating clinically with developing hypotension, tachycardia and significant abdominal findings should be resuscitated and Operated.. Whereas those patient who are hemodynamically unstable on presentation should adequately resuscitated and Operated . Hence in haemodynamically stable patients non-operative management is the preferred safe option of treatment with good clinical outcome and less associated morbidity and mortality.

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