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An Observational Study of Outcome in Blunt Abdominal Trauma Managed Conservatively.

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Abstract: *Trauma remains the most common cause of death for all individuals between the ages of 1 and 44 years and is the third most common cause of death regardless of age according to western data. The care of the trauma patient is demanding and requires speed and efficiency. Evaluating patients who have sustained blunt abdominal trauma remains one of the most challenging and resource-intensive aspects of acute trauma care. Our study is based on evaluation of 100 patients admitted in emergency department of a tertiary care centre with features of blunt abdominal trauma who were managed conservatively after thorough evaluation of patient and excluding any immediate operative intervention. This study establishes various outcomes of patients being managed conservatively after a blunt abdominal trauma .*

I. Introduction

Trauma-care systems in India are at a nascent stage of development. Industrialized cities, rural towns and villages coexist, with variety of health care facilities and almost complete lack of organized trauma care. There is gross disparity between trauma services available in various parts of the country. Rural India has inefficient services for trauma care, due to the varied topography, financial constraints and lack of appropriate health infrastructure. (1)

Out of the many categories for trauma, blunt trauma to abdomen, forms one of the major categories of those patients, in whom, death can be prevented with timely intervention. (2).

However most avoidable fatalities occur as a result of failed resuscitation and failure to recognise surgically correctable injuries.(3)

Physical examination findings are notoriously unreliable. One reason is that mechanisms of injury often result in other associated injuries that may divert the physician's attention from potentially life-threatening intra-abdominal pathology. Other common reasons are an altered mental state and drug and alcohol intoxication. Coordinating trauma resuscitation, demands a thorough understanding of the pathophysiology of trauma and shock, excellent clinical and diagnostic acumen, skill with complex procedures, compassion, and the ability to think rationally in a chaotic milieu.(2)

When the diagnosis is in doubt and clinical judgment suggest surgery , going ahead with exploration provides definitive treatment as well as a diagnosis , although a risk of negative exploration unless justified can increase the fatality.(4)

Blunt abdominal trauma usually results from motor vehicle collisions (MVCs), assaults, recreational accidents, or falls. The most commonly injured organs are the spleen, liver, retroperitoneum, small bowel, kidneys, bladder, colorectum, diaphragm, and pancreas. Men tend to be affected slightly more often than women.(2)

Our study highlights the various outcomes of patients who had been admitted with blunt abdominal trauma and were managed conservatively.

II. Aims And Objectives

1) To demonstrate the outcome of managing patients of blunt abdominal trauma based on age , sex of patient , abdominal organ involved and mechanism of injury
2) To demonstrate relation between co-morbidities , distracting injuries ,age group ,nutrition of patient and complications with hospital stay of patients with blunt abdominal trauma .

III. Materials And Method

This study was performed at Mahatma Gandhi Mission hospital, Kamothe, New Mumbai, Maharashtra, for a period of 2 years from May 2012 to April 2014 after approval by the institutional ethical committee done in September 2012. It was a prospective, analytical study which included 100 patients of trauma that were admitted from the emergency department of the hospital. The study included all the cases admitted with blunt trauma to the abdomen.

All the patients of blunt abdominal trauma, after initial resuscitation were evaluated clinically with respect to the symptoms and signs in the emergency room itself. This was aided with Focussed abdominal sonar

for trauma (FAST) and abdominal radiograph performed in the emergency department itself by a qualified radiologist. Also, the patients were subjected to Computerised tomography (CT scan).

Based on the clinical and radiological findings, patients were either managed conservatively or operatively. Patients who were hemodynamically unstable even after resuscitation and those who showed gas under diaphragm on erect/lateral abdominal radiograph, as a sign of perforation were immediately taken up for surgery and were thus excluded from our study group. Our study group involved patients who were initially resuscitated and responded to this line of management and hence conservatively managed. Each patient was granted a risk score that showed whether the patient could be managed conservatively or would require surgical intervention. .

Our risk factor scoring was based on 20 clinical parameters which involved vitals like pulse ,blood pressure ,age of patient ,mechanism of injury ,respiratory rate ,saturation of oxygen as per pulse oximeter ,co-morbid conditions of patient (eg .Ischemic heart diseases ,diabetes) ,built and nutrition ,distracting injuries, imprint abrasion , pallor ,abdominal tenderness, guarding ,rigidity, coastal tenderness , pelvic tenderness ,flank pain ,abdominal distention, haematuria and usg score for hemoperitoneum. Using these parameters our patients were grouped into three categories:

1. Low risk: patients who did not require any surgical intervention and could be managed in the wards.
2. Moderate risk: These patients were managed in intensive care unit. These were the ones who did not need a surgical intervention but required intensive monitoring and management. These were potential candidates for operative intervention if chances of the outcome being better than the conservative approach were justified.
3. High risk: These patients were poor candidates for conservative management but had responded to initial treatment .These patients at some point would require surgery.

All the patients were assessed on guidelines as per trauma protocols and each patient is evaluated by the researcher. All patients have been evaluated radiologically by use of Ultrasonography and X-rays. CT scan use was strictly reserved for patients who lie in the category of moderate to high risk category as given by the researcher and at no point was the health and treatment of patient compromised in name of research.

Patients who were assigned moderate to high risk by scoring in emergency were all admitted to Surgical Intensive Care Unit (SICU) where all the parameters were evaluated every half hour for first 24 hrs and then every hour for the rest of the patient's stay. Ultrasound of the abdomen was repeated every 4hours for patients who were stated high risk by our scoring and every 6hours for patients who were at moderate risk. Patients who initially responded to resuscitation but later were unable to maintain their vitals or ultrasound showed any positive findings which prompted surgery were then declared as patients unfit for conservative therapy and delayed laparotomy was undertaken.

The inclusion and exclusion criterion for our study was as follows:

Inclusion Criteria:1)Age 18yrs and above. 2)History of blunt trauma to abdomen <24hrs

Exclusion Criteria:1)Penetrating injuries .2)Head injury component GCS <14 . 3)Age <18.
4)Pregnant females

IV. Results

Table 1: Distribution of Data by Age-Group

AGE GROUP	NUMBER OF CASES	PERCENTAGE
18-30	40	40.0
31-50	41	41.0
>50	19	19.0
TOTAL	100	100

The above data shows age distribution among our trauma patients. Our study shows 41 percent of adults in age group of 31-50 and a close 40 percent of young patients in age range of 18-30. Adults above age 50 forms a small group of patients ie. 19 percent.

Table 2 : Distribution of Data by Sex

SEX	NUMBER OF CASES	PERCENTAGE
MALE	85	85.0
FEMALE	15	15.0
TOTAL	100	100

The above data shows that maximum number of patients belongs to male gender forming 85 percent of our study group and females form a mere 15 percent.

Table 3: Distribution of Data by Etiology of Injuries

Nature Of Injury	Number Of Cases	Percentage
Road Traffic Accidents	63	63.0
Fall	21	21.0
Fall Of Heavy Object	7	7.0
Assault	9	9.0
Total	100	100

Road traffic accidents form a major etiology of blunt abdominal trauma with 63 % and a fall from height following a close second with 21 %.

Table 4: Distribution of Data by Signs

Signs	Number Of Cases	Percentage
Abdominal Tenderness	96	96
Guarding	62	62
Rigidity	10	10
Coastal Margin Tenderness	53	53
Pelvic Tenderness	25	25
Flank Pain	29	29
Abdominal Distension	12	12
Haematuria	19	19

Abdominal tenderness forms a major presentation when it comes to blunt abdominal trauma as it is present in almost all patients occupying 96 % followed closely by guarding and coastal margin tenderness at 62% and 53%respectively.

Table 5: Distribution of Data by Duration of Hospital Stay

Duration Of Stay (Days)	Number Of Cases	Percentage
1-5	51	51.0
6-10	14	14.0
11-15	8	8.0
16-20	5	5.0
>20	22	22.0
Total	100	100

Hospital duration stay depends upon many factors; most of the conservatively managed patients have a maximum of 5 days stay. Hospital stay increases with presence of co-morbid conditions, other concurrent injuries, old age, mechanism of injury and many other factors. Hospital stay reflects the nature of injury and is directly proportional to impact the injury has on patient outcome.

Table 6: Distribution of Data by Conservative Management

Consrvative Management	Number Of Cases	Percentage
Yes	83	83.0
No	17	17.0
Total	100	100

Table 7 : Distribution of Data by Delayed Laparotomy Management

Delayed Laparotomy Management	Number of Cases	Percentage
Yes	17	17.0
No	83	83.0
Total	100	100

The above two data shows that among our study group of 100 patients who were managed conservatively only 17 percent underwent delayed laparotomy while maximum number of patients ie.83 percent were successfully managed conservatively.

Table 8 : Distribution of Data by Management

Treatment	Number Of Cases	Percentage
Consrvative Management	83	83.0
Delayed Laparotomy Management	17	17.0
Total	100	100

Table 9: Distribution of Data by Complications

Complications	Number of Cases	Percentage
None	57	57.0
Sepsis	9	9.0
Mi	3	3.0
Wound Infection And Anastomsis	1	1.0
Intestinal Obstruction	4	4.0
Wound Infection	5	5.0
Pnemonia	6	6.0
Hypertensive Crisis	4	4.0
Ketoacidosis	3	3.0
Pleural Effusion	2	2.0
Pulmonary Embolism	1	1.0
Pnemonia And Dvt	1	1.0
Ards	2	2.0
Mi With Ards	2	2.0
Total	100	100

TABLE 9 showing complicated and uncomplicated cases in operative and conservative management. Most of the patients managed conservatively did not have any complications. Most common complication was sepsis and pneumonia ie. 9 % and 6 % respectively. Out of the 43 patients who had complications 25.6% cases were post operative complication forming 64.7% of total number of operative cases. While 74.4% of cases under complication belonged to conservative management, which formed 38.5% of the total cases managed conservatively.

Table 10 : Distribution of Data by Diagnosis (Organ Involvement)

Diagnosis	**Number Of Cases**	**Percentage**
Liver Laceration	12	12.0
Splenic Laceration	9	9.0
Meseteric Injury	39	39.0
Large Bowel Injury	1	1.0
Small Bowel Injury	2	2.0
Renal Laceration	3	3.0
Liver Contusion	13	13.0
Bladder Contusion	4	4.0
Splenic Contusion	10	10.0
Renal Contusion	6	6.0
Pancreatic Injury	1	1.0
Total	100	100

In the above data its shows most commonly injured organ was mesentery (39 %) followed closely by liver (25 %) and spleen (19%) involvement. Least injured organ was pancreas which formed only 1%.

Table 11 : Distribution of Data by Mortality

Mortality	**Number Of Cases**	**Percentage**
None	97	97.0
Yes	3	3.0
Total	100	100

Table 12: Cross Tabulation of Data of Distract Injuries by Duration of Hospital Stay

1-5 DAYS=1, 6-10=2, 11-15=3, 16-20=4, >20=5 * LOW RISK=1, MODERATE RISK=2, HIGH RISK=3 Crosstabulation

			LOW RISK=1, MODERATE RISK=2, HIGH RISK=3			
			1.00	2.00	3.00	Total
1-5 DAYS=1, 6-10=2, 11-15=3, 16-20=4, >20=5	1.00	Count	47	3	1	51
		% within 1-5 DAYS=1, 6-10=2, 11-15=3, 16-20=4, >20=5	92.2%	5.9%	2.0%	100.0%
		% of Total	47.0%	3.0%	1.0%	51.0%
	2.00	Count	9	5		14
		% within 1-5 DAYS=1, 6-10=2, 11-15=3, 16-20=4, >20=5	64.3%	35.7%		100.0%
		% of Total	9.0%	5.0%		14.0%
	3.00	Count	4	2	2	8
		% within 1-5 DAYS=1, 6-10=2, 11-15=3, 16-20=4, >20=5	50.0%	25.0%	25.0%	100.0%
		% of Total	4.0%	2.0%	2.0%	8.0%
	4.00	Count		4	1	5
		% within 1-5 DAYS=1, 6-10=2, 11-15=3, 16-20=4, >20=5		80.0%	20.0%	100.0%
		% of Total		4.0%	1.0%	5.0%
	5.00	Count	7	6	9	22
		% within 1-5 DAYS=1, 6-10=2, 11-15=3, 16-20=4, >20=5	31.8%	27.3%	40.9%	100.0%
		% of Total	7.0%	6.0%	9.0%	22.0%
Total		Count	67	20	13	100
		% within 1-5 DAYS=1, 6-10=2, 11-15=3, 16-20=4, >20=5	67.0%	20.0%	13.0%	100.0%
		% of Total	67.0%	20.0%	13.0%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	49.942	8	.000
Likelihood Ratio	50.946	8	.000
Linear-by-Linear Association	35.672	1	.001
N of Valid Cases	100		

V. Correlation Analysis

	Value	Approx. Sig.
Pearson's R	.875	.000
Spearman Correlation	.852	.000

***P<0.05 = Significant**
***P > 0.05= Not Significant**
***Moderate Risk and High Risk Shows Highly and Greater Significant**
***Moderate Risk and High Risk Shows Duration of Hospital Stay in Days Increases**
*** Pearson Chi-Square Test Shows Statistical Difference between Groups, P Value and Significance**

The above data concludes that distracting injuries that is injuries other than injury to abdomen increases the hospital stay and hence increases the morbidity, the health care cost and affects the final outcome.

Table 13: Cross Tabulation of Data of Comorbidities by Duration of Hospital Stay

1-5 DAYS=1, 6-10=2, 11-15=3, 16-20=4, >20=5 * LOW RISK=1, MODERATE RISK=2, HIGH RISK=3 Crosstabulation

			LOW RISK=1, MODERATE RISK=2, HIGH RISK=3			
			1.00	2.00	3.00	Total
1-5 DAYS=1, 6-10=2, 11-15=3, 16-20=4, >20=5	1.00	Count	42	8	1	51
		% within 1-5 DAYS=1, 6-10=2, 11-15=3, 16-20=4, >20=5	82.4%	15.7%	2.0%	100.0%
		% of Total	42.0%	8.0%	1.0%	51.0%
	2.00	Count	9	3	2	14
		% within 1-5 DAYS=1, 6-10=2, 11-15=3, 16-20=4, >20=5	64.3%	21.4%	14.3%	100.0%
		% of Total	9.0%	3.0%	2.0%	14.0%
	3.00	Count	3	3	2	8
		% within 1-5 DAYS=1, 6-10=2, 11-15=3, 16-20=4, >20=5	37.5%	37.5%	25.0%	100.0%
		% of Total	3.0%	3.0%	2.0%	8.0%
	4.00	Count	3	2		5
		% within 1-5 DAYS=1, 6-10=2, 11-15=3, 16-20=4, >20=5	60.0%	40.0%		100.0%
		% of Total	3.0%	2.0%		5.0%
	5.00	Count	11	3	8	22
		% within 1-5 DAYS=1, 6-10=2, 11-15=3, 16-20=4, >20=5	50.0%	13.6%	36.4%	100.0%
		% of Total	11.0%	3.0%	8.0%	22.0%
Total		Count	68	19	13	100
		% within 1-5 DAYS=1, 6-10=2, 11-15=3, 16-20=4, >20=5	68.0%	19.0%	13.0%	100.0%
		% of Total	68.0%	19.0%	13.0%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	22.608	8	.004
Likelihood Ratio	22.379	8	.004
Linear-by-Linear Association	13.649	1	.000
N of Valid Cases	100		

Symmetric Measures

	Value	Approx. Sig.
Pearson's R	.847	.000
Spearman Correlation	.862	.001

***P<0.05 = Significant**
***P > 0.05= Not Significant**
***Moderate Risk And High Risk Shows Highly And Greater Significance**
***Moderate Risk And High Risk Shows Duration Of Hospital Stay In Days Increases**
*** Pearson Chi-Square Test Shows Statistical Difference Between Groups, P Value And Significance**

The above data shows that patients with co-morbid conditions like medical history of diabetes, ischemic heart diseases, hypertension increases the morbidity and mortality .It finally affects the outcome irrespective of intervention taken.

Table 14: Cross Tabulation of Data of Age in Range by Duration of Hospital Stay

1-5 DAYS=1, 6-10=2, 11-15=3, 16-20=4, >20=5 * LOW RISK=1, MODERATE RISK=2, HIGH RISK=3 Crosstabulation

			LOW RISK=1, MODERATE RISK=2, HIGH RISK=3			
			1.00	2.00	3.00	Total
1-5 DAYS=1, 6-10=2, 11-15=3, 16-20=4, >20=5	1.00	Count	22	18	11	51
		% within 1-5 DAYS=1, 6-10=2, 11-15=3, 16-20=4, >20=5	43.1%	35.3%	21.6%	100.0%
		% of Total	22.0%	18.0%	11.0%	51.0%
	2.00	Count	8	4	2	14
		% within 1-5 DAYS=1, 6-10=2, 11-15=3, 16-20=4, >20=5	57.1%	28.6%	14.3%	100.0%
		% of Total	8.0%	4.0%	2.0%	14.0%
	3.00	Count	1	6	1	8
		% within 1-5 DAYS=1, 6-10=2, 11-15=3, 16-20=4, >20=5	12.5%	75.0%	12.5%	100.0%
		% of Total	1.0%	6.0%	1.0%	8.0%
	4.00	Count	1	3	1	5
		% within 1-5 DAYS=1, 6-10=2, 11-15=3, 16-20=4, >20=5	20.0%	60.0%	20.0%	100.0%
		% of Total	1.0%	3.0%	1.0%	5.0%
	5.00	Count	7	10	5	22
		% within 1-5 DAYS=1, 6-10=2, 11-15=3, 16-20=4, >20=5	31.8%	45.5%	22.7%	100.0%
		% of Total	7.0%	10.0%	5.0%	22.0%
Total		Count	39	41	20	100
		% within 1-5 DAYS=1, 6-10=2, 11-15=3, 16-20=4, >20=5	39.0%	41.0%	20.0%	100.0%
		% of Total	39.0%	41.0%	20.0%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	27.933	8	.004
Likelihood Ratio	28.051	8	.002
Linear-by-Linear Association	24.853	1	.003
N of Valid Cases	100		

Symmetric Measures

	Value	Approx. Sig.
Pearson's R	.932	.003
Spearman Correlation	.822	.004

***P<0.05 = Significant**
***P > 0.05= Not Significant**
***Moderate Risk and High Risk Shows Highly and Greater Significant**
***Moderate Risk and High Risk Shows Duration of Hospital Stay in Days Increases**
*** Pearson Chi-Square Test Shows Statistical Difference between Groups, P Value and Significance**

The above study shows that younger age group responds better to treatment modalities with positive outcomes and minimum complications and hence an early discharge from hospital compared to older age group which are bound for poor response to interventions weather conservative or operative.

Table 15: Cross Tabulation of Data of Mechanism of Injury by Duration of Hospital Stay

1-5 DAYS=1, 6-10=2, 11-15=3, 16-20=4, >20=5 * LOW RISK=1, MODERATE RISK=2, HIGH RISK=3 Crosstabulation

			LOW RISK=1, MODERATE RISK=2, HIGH RISK=3			
			1.00	2.00	3.00	Total
1-5 DAYS=1, 6-10=2, 11-15=3, 16-20=4, >20=5	1.00	Count	40	10	1	51
		% within 1-5 DAYS=1, 6-10=2, 11-15=3, 16-20=4, >20=5	78.4%	19.6%	2.0%	100.0%
		% of Total	40.0%	10.0%	1.0%	51.0%
	2.00	Count	5	3	6	14
		% within 1-5 DAYS=1, 6-10=2, 11-15=3, 16-20=4, >20=5	35.7%	21.4%	42.9%	100.0%
		% of Total	5.0%	3.0%	6.0%	14.0%
	3.00	Count	4	4		8
		% within 1-5 DAYS=1, 6-10=2, 11-15=3, 16-20=4, >20=5	50.0%	50.0%		100.0%
		% of Total	4.0%	4.0%		8.0%
	4.00	Count	3	2		5
		% within 1-5 DAYS=1, 6-10=2, 11-15=3, 16-20=4, >20=5	60.0%	40.0%		100.0%
		% of Total	3.0%	2.0%		5.0%
	5.00	Count	4	8	10	22
		% within 1-5 DAYS=1, 6-10=2, 11-15=3, 16-20=4, >20=5	18.2%	36.4%	45.5%	100.0%
		% of Total	4.0%	8.0%	10.0%	22.0%
Total		Count	56	27	17	100
		% within 1-5 DAYS=1, 6-10=2, 11-15=3, 16-20=4, >20=5	56.0%	27.0%	17.0%	100.0%
		% of Total	56.0%	27.0%	17.0%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	40.063	8	.000
Likelihood Ratio	42.886	8	.001
Linear-by-Linear Association	23.075	1	.001
N of Valid Cases	100		

Symmetric Measures

	Value	Approx. Sig.
Pearson's R	.833	.001
Spearman Correlation	.830	.001

***P<0.05 = Significant**
***P > 0.05= Not Significant**
***Moderate Risk and High Risk Shows Highly and Greater Significant**
***Moderate Risk and High Risk Shows Duration of Hospital Stay in Days Increases**
*** Pearson Chi-Square Test Shows Statistical Difference between Groups, P Value and Significance**

The above data shows mechanism of injury playing a vital role in deciding the outcome of injury. More grievous the mechanism of injury more severe the injury which is reflected by increase in the hospital stay.

Table 16: Cross Tabulation of Data of Build and Nutrition by Complications

NONE=1,SEPSIS=2,M I=3,WOUND INFECTION AND ANASTOMSIS=4,INTESTINAL OBSTRUCTION=5,WOUND NFECTION=6,PNEMONIA=7,HYPERTENSIVE CRISIS=8,KETOACIDOSIS=9,PLEURAL EFFUSION=10,PULMONARY EMBOLISM=11,PNEMONIA AND DVT=12,ARDS=13,M.I WITH ARDS=14 * LOW RISK=1, MODERATE RISK=2, HIGH RISK=3 Crosstabulation

			LOW RISK=1, MODERATE RISK=2, HIGH RISK=3			
			1.00	2.00	3.00	Total
NONE=1,SEPSIS=2,M I=3,WOUND INFECTION AND ANASTOMSIS=4,INTESTINAL OBSTRUCTION=5,WOUND INFECTION=6,PNEMONIA=7,HYPERTENSIVE CRISIS=8,KETOACIDOSIS=9,PLEURAL EFFUSION=10,PULMONARY EMBOLISM=11,PNEMONIA AND DVT=12,ARDS=13,M.I WITH ARDS=14	1.00	Count	24	23	10	57
		% of Total	24.0%	23.0%	10.0%	57.0%
	2.00	Count	1	6	2	9
		% of Total	1.0%	6.0%	2.0%	9.0%
	3.00	Count	3			3
		% of Total	3.0%			3.0%
	4.00	Count	1			1
		% of Total	1.0%			1.0%
	5.00	Count	1	2	1	4
		% of Total	1.0%	2.0%	1.0%	4.0%
	6.00	Count		3	2	5
		% of Total		3.0%	2.0%	5.0%
	7.00	Count	2	2	2	6
		% of Total	2.0%	2.0%	2.0%	6.0%
	8.00	Count	2	2		4
		% of Total	2.0%	2.0%		4.0%
	9.00	Count	3			3
		% of Total	3.0%			3.0%
	10.00	Count		1	1	2
		% of Total		1.0%	1.0%	2.0%
	11.00	Count		1		1
		% of Total		1.0%		1.0%
	12.00	Count	1			1
		% of Total	1.0%			1.0%
	13.00	Count		1	1	2
		% of Total		1.0%	1.0%	2.0%
	14.00	Count	1		1	2
		% of Total	1.0%		1.0%	2.0%
Total		Count	39	41	20	100
		% of Total	39.0%	41.0%	20.0%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	58.142	26	.003
Likelihood Ratio	35.487	26	.001
Linear-by-Linear Association	34.426	1	.004
N of Valid Cases	100		

Symmetric Measures

	Value	Approx. Sig.
Pearson's R	.714	.004
Spearman Correlation	.702	.004

***P<0.05 = Significant**
***P > 0.05= Not Significant**
***Moderate Risk And High Risk Shows Highly And Greater Significant* Pearson Chi-Square Test Shows Statistical Difference Between Groups, P Value And Significance**

The above table shows that patients with good built and nutrition underwent less number of complications than compared to patients with poor built and nutrition

Table 17: Descriptive Statistics Mean and Standard Deviation

Descriptive Statistics

	N	Mean	Std. Deviation
AGE	100	1.7900	.7426
SEX	100	1.1500	.3589
MECHANISM OF INJURY	100	1.6100	.7640
COMORBIDITIES	100	1.4500	.7160
BUILT AND NUTRITION	100	1.8100	.7480
DISTRACT	100	1.4600	.7166
AGE IN RANGE	100	1.8100	.7480
DURATION OF HOSPITAL STAY	100	2.3300	1.6395
RISK PERCENTAGE LOW RISK	100	2.5900	.9331
RISK PERCENTAGE MODERATE RISK	100	1.7000	.5774
RISK PERCENTAGE HIGH RISK	100	1.2000	.4495
DIAGNOSIS	100	4.6300	2.9359
CONSERVATIVE MGMT	100	1.1700	.3775
DELAYED LAPAROTOMY MGMT	100	1.8300	.3775
COMPLICATIONS	100	3.6100	3.9668
MORTALITY	100	1.0300	.1714
ETIOLOGY	100	1.6200	.9617
Valid N (listwise)	100		

Table 18: Descriptive Statistics Mean, Standard Deviation and Range

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
AGE1	100	18.00	90.00	37.9200	16.6634
Valid N (listwise)	100				

Table 19: Chi-Square Test for Conservative

Conservative	**Number of Cases**	**Percentage**	**Chi-Value**	**P-Value**	**Result**
Low Risk	64	77.1	42.662	0.002	Significant
Moderate Risk	19	22.9	44.582	0.001	Significant
High Risk	0	0	0	0.190	Not Significant
Total	83	100			

P < 0.05 = Significant
P > 0.05 = Not Significant
Tabulated Value = 3.84
* Moderate Risk Shows Highly Significant
* Chi-Square Test Shows Statistical Difference Between Groups, P Value And Significance

Table 20: Chi-Square Test for Delayed Laparotomy

Delayed Laparotomy	**Number Of Cases**	**Percentage**	**Chi-Value**	**P-Value**	**Result**
Low Risk	0	0	0	0.114	Not Significant
Moderate Risk	6	35.3	43.026	0.002	Significant
High Risk	11	64.7	80.597	0.001	Highly Significant
Total	17				

P < 0.05 = Significant
P > 0.05 = Not Significant
Tabulated Value = 3.84
*** High Risk in Delayed Laparotomy Shows Highly Significant**
***Moderate Risk and High Risk Shows Significant and Highly Significant**
*** Chi-Square Test Shows Statistical Difference between Groups, P Value and Significance**

The above data shows that the score we have put forward validates as patients with low risk i.e 77.1% and patients with moderate risk 22.9 % of the total 83 cases managed conservatively did not need any surgical intervention.

The second table shows that 17 out of the 100 cases who underwent delayed laparotomy out of which 64.7% were marked high risk and 35.3 % were moderate risk were predicted to undergo surgical intervention which again validates our score.

VI. Discussion

Injuries account for at least 10% of deaths worldwide, and low- and middle-income countries are disproportionately affected (WHO 2010). As these countries industrialize, the burden of injuries would continue to grow (Mock BWHO 2005, WHO DVIPD 2009). Many injury-related deaths can be avoided with established injury prevention strategies and improvements in trauma care, but this requires carefully orchestrated systems of prevention and care(Mock Lancet 2004, Mock WJS 2012). In India, the WHO estimates that 10% of deaths and 13% of disability-adjusted life years lost are due to injury (WHO 2009).

Blunt abdominal trauma, amongst injuries, causes significant morbidity and mortality. This study concentrates on the various aspects of blunt trauma.

Mechanisms of injury have major impact on the patient outcomes. The most common cause of blunt trauma abdomen reflected in our study was road traffic accident accounting to 63% of the cases. This was comparable to various other studies in India and worldwide. Mohapatra et al have attributed 62% cases of blunt trauma to abdomen to RTA. Study by Curie et al has also reported 58.6% cases due to RTAs.(6)(7)Fall from height formed the second most common cause (21%) followed by assault (9%) and hit or fall of heavy object (7%)(8).

In our study most of the patients were in the third to fifth decade of life forming a total of 81 %. Only 19 % were in the **age group** above 50 years. The mean age group in our study was 37 years. Many of the studies done showed similar results. A study by Richard curie showed maximum cases in the second to fifth decade of life (59%) with mean age of 28 years.

Like most of the studies, our study also shows domination by males. Around 85% cases in our study were males. Tripathi et al have also reported 71% male patients in their study with a male to female ratio of 4.4:1(6).

Out of our 100 cases, 96 % presented with abdominal tenderness with local or generalised guarding present in 62 %, coastal margin tenderness in 53 %, flank pain 29 %, pelvic tenderness 25 %, haematuria in 19%, abdominal distension in 12 % and guarding in only 12 % of patients. Our study is comparable to Tripati et al which reported abdominal tenderness and guarding in 80% and 58% as two of the **most common presentation** of blunt abdominal trauma(6)(7)(8).

Hospital stay reflects the number of days required for treatment which in turn reflects the final outcome. The maximum hospital stay was 45 days as seen by us. It was seen mostly in the post operative cases with complications like anastomotic leak and also with co morbidities like diabetes mellitus and associated other injuries like long bone fractures. It was observed that patients managed conservatively had complications that arose from co-morbid illnesses like diabetes, ischemic heart disease and hypertension. In our study the duration of hospital stay ranged from 1 -45 days. Patient without co-morbid conditions had a minimum stay range from 1-5 days. These patients formed 42% cases, while patients with co-morbid conditions of moderate and high risk formed 8% and 1% respectively. Patients with stay ranging from 6-10 days had patients with no co-morbid conditions 9% with moderate risk of co-morbid condition 3% and high risk of 2 %. Patients with stay of 11-15 days had patients with no co morbid condition as 3 %, moderate risk of 3% and high risk of 2 %. Patients having stay of 16-20 days had 3% of cases with no co-morbid condition while moderate risk and high risk had 2 % and 0% respectively. Only total of 22 % of total cases had stay ranging from more than 20 days out of which high risk category formed 8%. Our study indicates that patients with known co-morbid conditions like ischemic heart disease, diabetes and hypertension had increased hospital stay and these factors definitely had a significant impact on patient outcome.

Patients with **distracting injuries** like chest trauma, fracture of upper limb and lower limb when present with abdominal trauma increased the hospital stay and also affected the outcome. Such patients when labelled as high risk 13% showed significant change when compared to patients with no other injuries 67%. Of these 67 cases, 92 % had stay ranging from 1-5 days while those cases of high risk where distracting injuries were present 40.9%. The 13 cases of high risk category had hospital stay more than 20 days. This was vital in proving that distracting injuries directly affected the outcome of patients who were conservatively managed.

Age plays an important role when it comes to the final outcome of injury to patients. It is evident that in absence of any co-morbid or distracting injuries younger age group 18-30 fair better than older age group of 31-50 and above 50 constituting 43.1%, 35.3% and 21% when it comes to minimum hospital stay. On the contrary, age group of 31-50 constituted 45.5% of the cases who had maximum duration of stay in hospital more

than 20 days. This reflected that as age increases, patients tend to develop more complications in either conservative or operative group. This also affects the hospital stay and the response to treatment.

Our study observed that the knowledge of mechanism of injury played an important part as far as predicting the injury pattern and its outcome. The study showed that more grievous the mechanism, longer the duration of treatment. High risk injury formed 45.5 % out of the total 22 cases who had prolonged treatment compared to just 18.2% in low risk category. While in trivial or low risk, mechanism of injury formed 78.4% of the total 51 cases which had minimum stay for treatment. A meagre 2% of patients with high risk had treatment duration of less than 5 days.

In our study, out of 100 cases, 43 percent had **complications.**Most of the patients managed conservatively did not have any complications which formed 61.4% of total cases managed conservatively. Most common complication was sepsis and pneumonia constituting 9 % and 6 % respectively. Out of the 43 patients who had complications 25.6% occurred post operatively forming 64.7% of total number of operative cases. While 74.4% of cases belonged to the ones managed conservatively. Reasons for occurrence of complications in conservatively managed patients were poor build and nutrition, older age group, pallor on presentation and presence of distracting injuries. This reflected that complications occured less in patients managed conservatively as compared to operative patients. Complications in the patients managed conservatively occurred due to causes other than the trauma like myocardial infarction, ketoacidosis which got aggravated due to trauma and played an important role in outcome.

VII. Conclusion

An accurate method for quantitatively summarizing injury severity has many potential applications. The ability to predict outcome from trauma (ie, mortality) is perhaps the most fundamental use of injury severity scoring, a use that arises from the patient's and the family's desires to know the prognosis. More recently, physicians suggested that injury severity scoring can provide objective information for end-of-life decision-making and resource allocation. Trauma mortality prediction in individual patients by any scoring system is limited and is in general no better than good clinical judgment. Therefore, decisions for individual patients should never be based solely on a statistically derived injury severity score. However, scoring systems can serve to estimate quantitatively the level of acuity of injured patients that are applied to adjustments in hospital outcome assessments.

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