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Original Article

Management of polytrauma patients in emergency department: An experience of a tertiary care health institution of northern India

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BACKGROUND: In a tertiary care institute of northern India, the emergency department receives an average of 6–7 patients with poly trauma every day. Of these patients, some come directly and many are referred from other hospitals from the region. Various problems are faced in the management of patients with poly trauma. This study aimed to elicit various complaints, suggestions and possible solutions in the management of patients with poly trauma.

METHODS: A retrospective cross sectional study was done on 210 patients in the emergency OPD for a period of 2 months. All the records of the patients with poly trauma were studied and the problems during their management were measured against 6 predetermined steps (step I to step VI).

RESULTS: In the younger generation, males were predominantly the primary victims of poly trauma injury, and road traffic accident was the major etiological factor. Injuries involving more than 2 specialties induced many problems during the management of patients with poly trauma. Of 210 patients we studied, 32 patients had problems at various steps and maximum problems in step III , i.e. co-ordination between various specialties in the management of patients with poly trauma.

CONCLUSION: A proper poly trauma management team and a well defined standard operative procedure are the keys to effective management of patients with poly trauma by minimizing the problems encountered.

KEY WORDS: Polytrauma; Emergency department; Triage

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INTRODUCTION

Poly trauma or multiple trauma is a medical term describing the condition of a person who has been subjected to multiple traumatic injuries.[1] Poly trauma is a major cause of morbidity and mortality in both developed and developing countries.[2] Trauma remains the leading cause of death and disability in children and young adults.[3] The incidence and prevalence of poly trauma varies from region to region. The most common causes are road traffic accidents, fall from heights, bullet injuries, etc.[2] In civilian life, poly trauma is often associated with motor vehicle accidents. It may also result from blast injuries sustained by improvised explosive devices. Poly trauma patients represent the ultimate challenge to trauma care and the optimization of their care is a major focus of clinical research. The heaviest toll of traumatic deaths occurs within the first hour following trauma, often defined as "the golden hour of trauma".[4] Following the principle of "Time is Essence", management during the first hour of injury is essential. Most of the patients with poly trauma land in the emergency departments of hospitals.[4] The mission of a trauma team is to enlist the problems, establish priorities, stabilize the patient and finally transfer the

patient under the specialized care of the team.

Management of patients with poly trauma at the present hospital

The present hospital is an autonomous body which came into existence by an Act of Parliament of India in 1967 and it is an 'institute of national importance'. It provides high quality treatment and tertiary care to the patients from various states of northern India. A comprehensive emergency department (ED) exists in this hospital, which provides life saving medical and surgical services to the patients under one roof. The ED consists of 110 beds. It caters to medical, surgical and traumatic emergencies round the clock. It has an attached laboratory, digital X-ray/ultrasound/ECG and 6 operation theatres functioning round the clock. The patients with poly trauma are treated in the ED by various specialists (general surgeon, anesthetist, orthopaedic surgeon, neurosurgeon, cardiothoracic surgeon, ENT surgeon etc.), nurses and other paramedical personnel.

The annual hospital statistics of the institute under study is provided in Table 1.

The procedure being followed in the ED to treat patients with poly trauma

Step 1: Initial assessment and preparation of treatment plan. As the patient enters the emergency he is attended by a general surgeon. Step 2: Patient's information sent to other referral specialties. After the initial assessment, the general surgeon informs the doctors on duty of the concerned specialties over the phone and enters the patient's particulars in the master register which is maintained by the general surgery department. Step 3: Assessment by various specialties. On receiving the call, the resident doctor on duty of the concerned specialty attends the patient. Step 4: Referral to specialties other than initially planned. While the patient is undergoing treatment, some patients might require the consultation of other specialties. In such a case, the concerned doctor will be required to inform by specialty himself or co-ordinate with the general surgeon. Step 5: Clearance of the patient. The specialty referred by the general surgeon has to decide whether to admit or discharge the patient. Step 6: Final responsibility/ ownership. In case of patients with poly trauma requiring various specialties for consultation, the specialty which clears the patient in the end is ultimately responsible for the treatment and discharge of the patient (Table 2).

Statement of problem

In the ED, there are frequent complaints, in particular, regarding the management of the patients with poly trauma, which leads to delay in their discharge. Delayed discharge of these patients leads to an increase in average length of stay (ALS) of the patients, further resulting in unavailability of the beds to other patients requiring emergency treatment. Thus the present study was conducted to elicit the constraints at various steps of management of the patients with poly trauma and to design a standard operating procedure (SOP) for the management of these patients.

METHODS

The cross-sectional study was carried out in the ED of the tertiary care institute of northern India. A total of 210 patients visiting the ED were studied in a period of 2 months (June 10 to August 10, 2011). The details of the patients visiting the ED (as per the criteria described above) were recorded on a day-to-day basis from the master register maintained by the general surgery department. The files and cards of these patients were also reviewed from the emergency surgical OPD. Information was retrieved from the cards to achieve the required objectives. There were six possible steps in the delay of management and the delay at each step was studied. The criteria for the delay at each step are shown in Table 2.

Table 1. Annual hospital statistics of the tertiary care institution under study

Variables (service)	Number
Hospital	
Total number of hospital beds	1 765
Bed occupancy rate	92.3
Average length of stay	8.4
Annual OPD	1 657 200
OPD patients per day	5 469
Indoor patients	64 745
Indoor patients per day	177
Total nurses	1 647
Emergency	
Total beds	110
Average length of stay	7.2
Annual OPD	52 298
OPD patients per day	143
Indoor patients	32 334
Indoor patients per day	89
Nurses in emergency	196+1 DNS
Nurses in ES OPD	39

Source: Statistical Report 2010 from Medical Record Department of the institute

RESULTS

Profiles of patients with poly trauma

Of the 210 patients with poly trauma, 169 (80.47%) were male and 41 (19.52%) female. Their age ranged from 3 years to 85 years in males and 3 years to 70 years in female, with a mean of 32 years. Most of the patients with poly trauma were in the age group of 15 to 30 years, followed by 31 to 45 years. The patients reported in the emergency department were from the different states of the country, most of them from Punjab 37% (*n*=78) followed by Chandigarh 22% (*n*=46), Haryana 15% (*n*=32) and Himachal Pradesh 13% (*n*=28). Regarding the referral status, 53% (*n*=112) of the patients were referred from various hospitals of the region and 43% (*n*=98) directly came to the ED of the institute. Of the patients, 72% (*n*=150) were due to road side accidents, followed by fall from height 15% (*n*=31) and railway accident 5% (*n*=11). The profile of the patients with poly trauma is shown in Table 3.

Referrals for consultations

Altogether 671 consultations were done for 210 patients by various specialties (Table 4). On an average, each patient required about 3.2 consultations. Orthopedics required 27% (*n*=184) of the conslultations, neurosurgery 22% (*n*=149), plastic surgery 17% (*n*=114), and anesthesia 10% (*n*=64).

Constraints at various steps in the management of patients with poly trauma

During the management, problems appeared in 32 (15.2%) of the patients with poly trauma. Most of the problems (*n*=19, 60%) occurred at stage III as the doctor of the concerned specialty did not attend the call within 24 hours of information as per the predetermined criteria. At stage IV 6% (*n*=2) patients had problems as there was a delay in sending information to other referred department not mentioned in the treatment plan. In 9 patients (28%), problems were also reported at stage VI, as no department was ready to take the responsibility of discharging the patient and hence the patient was kept lying in the emergency room for more days without any active treatment. However, no problem was observed at

Table 3. Profile of the patients with poly trauma attending emergency OPD of the institute

Variables	Number (*n*=210)	Percentage (%)
Age (yr)		
>15	22	10.47
15–30	78	37.14
31–45	52	24.76
46–60	40	19.04
61–65		SRFT
12	5.71	SRFT
76–90	6	2.85
Gender		
Male	169	80.4
Female	41	19.5
Referral status		
Referred patients	112	53
Direct patients	98	47
Area of origin		
Punjab	78	37
Chandigarh	46	22
Haryana	32	15
Himachal pradesh	28	13
Uttar pradesh	10	5
Bihar	6	3
Address unknown	10	5
Causes of poly trauma		
Road side accident	150	72
Fall from height	31	15
Railway accident	11	5
Burn	7	3
Gun shot injury	3	1
Others	8	4

Table 2. Procedure for management of patients with poly trauma in the institute

Steps	Procedure	Time limit
I	Assessment of the poly trauma patients by the general surgeon	Within 1 hour
II	Preparation of treatment plan, referral of the patient and information to different specialties	1 hour
III	Patient attended by different specialties as per the treatment plan	24 hours
IV	Patient attended by other specialties not initially planned by the General surgeon	24 hours
V	Clearance given by different specialties	24 hours
VI	Ultimate responsibility of the patient for the treatment and discharge	24 hours

Table 4. Proportion of calls attended by various specialties referred by the general surgeon in the ED of the institute

Referral department	Number (*n*=671)	Percentage (%)
Orthopedics	184	27
Neurosurgery	149	22
Plastic surgery	114	17
Anesthesia	64	10
CTVS	55	8
ENT	39	6
Ophthalmic	29	4
General surgery	21	3
Urology	10	2
Dental	3	1
Obstetrics & gynecology	2	0.29
Psychiatry	1	0.14

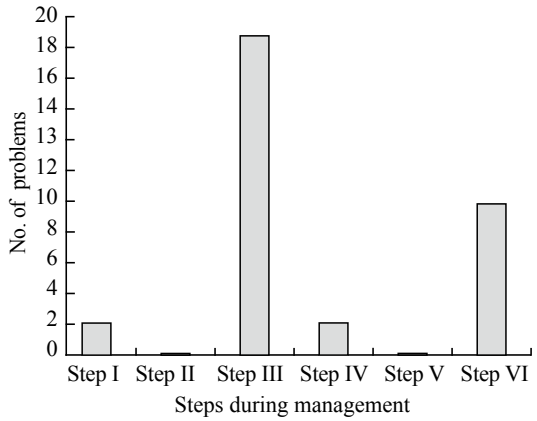

Figure 1. Constraints at various steps in the management of patients with poly trauma in the ED of the institute under study.

stage II and stage V (Figure 1).

Besides the above stated problems, some other problems were also observed in the management of the patients with poly trauma. Firstly, there was absence of a triage system and non-availability of a separate area for the admitted polytrauma patients in the emergency department. This resulted in mixing up of the patients with poly trauma with the patients from other specialties. Secondly, in emergency surgical OPD (ESOPD) there was no separate area for resuscitation of the patients with poly trauma nor anesthetist to perform resuscitation. Thirdly, the time regarding the call sent to and attended by various specialties was not mentioned on the OPD card or the master register (no column to mention the time). There was also lack of coordination amongst various specialties while managing patients with poly trauma.

DISCUSSION

The initial management of a patient with poly trauma is of vital importance in minimizing both patient morbidity and mortality.[5] The main principle behind trauma management is an organized team approach, i.e. poly trauma victims are best managed by a team. The initial evaluation of a person who is injured critically from multiple traumas is a challenging task and every minute can make a difference between life and death. The delay from any member of the team may lead to death of the patient. The receiving facility ideally should be designated to receive seriously injured patients and the resources and expertise to adequately manage their injuries.[6] To avoid any delay and to have a best initial management of poly trauma, patient triage is important. The triage is sorting out of patients, based on the need of treatment and available resources to provide for the treatment.[7]

The results of our study were similar to those of a study conducted in a hospital of Saudi Arabia where most of trauma patients were in the age group between 16 and 30 years. We found that males were affected more often than females (19:1) and that road traffic accident was a predominant etiological factor followed by falls from height. As a tertiary care institute, the cases of poly trauma have been reported from various regions and many cases have been referred from various hospitals. The results of our study showed that the problems faced at various steps while managing poly trauma patients were observed mostly in cases requiring consultations of 3–4 departments. The lack of co-ordination was probably the main cause leading to delay in management of poly trauma patients. This led to an increase in average length of stay of the patient in the ED. Most consultations were required by orthopedics department followed by neurosurgery. It has been documented that activation of a prepared trauma team results in better patient care and improvement of patient survival.[8] A well functioning poly trauma team with a team manager, a proper triage system, good coordination, documentation and a well defined standard operating procedure is the key to the proper management of poly trauma patients. The suggested standing operating procedure for managing patients with poly trauma is as follows:

Suggested standard operating procedures

Accordingly, standard operating procedure is suggested in managing poly trauma patients of a tertiary care institute.

1) There should be a poly trauma management team consisting of general surgeon, anaesthetist, orthopaedic surgeon, neurosurgeon, cardiothoracic surgeon, ENT surgeon, nurses and other paramedical staff. During the initial management of a critically injured patient (trauma resuscitation), the trauma team must stabilize the patient, determine the extent of injury, and develop an initial treatment plan for hospitalization.[9] There should also be a team manager, who will be responsible for co-ordination among various team members so as to facilitate proper patient care.

2) A proper system for triage should be formed at the reception of the patient as per the pre fixed criteria. Triage of patients can be done on the basis of the following injury scale:[10]

Level of	AIS score	Color code
1	minor	green
2	moderate	yellow
3	critical	red

3) Colored bands on the wrist of the patient and colored stamp on the OPD card of the poly trauma patient can be used to differentiate them from other patients depending on the type of injury.

4) After triaging, the general surgeon as team manager should attend the patient and decide the treatment plan accordingly. The team manager should now be responsible for informing all the concerned specialties and also note down the time of information sent in the master register along with time at which the call was attended by the concerned specialty.

5) If any specialty does not attend the patient within one hour of information, then a reminder call should be given by the team manager.

6) If referral to any other specialty is required other than that planned during the treatment, the team manager should be informed so that he can coordinate with the concerned specialty and also enter the call in the master register.

7) All the communication regarding treatment should be done through the team manager to avoid confusion. Proper record maintenance by the team manager is a must.

8) The concerned specialty should clear the patient in time and also inform the team manager. Information should be recorded in the master register.

9) The specialty which clears the patient in the end should be responsible for discharging the patient.

10) In case of a problem, the team manager has to decide the department which should discharge the patient and if required, he can consult the officer in charge of the ED.

In conclusion, most of the patients with poly trauma admitted in the ED during the study period were in the younger age group in this study. Males (80.47%) were significantly more affected than females (19.52%) and road traffic accident (72%) was the predominating etiological factor followed by falls. Many consultations were done with departments of orthopedics (27%) and neurosurgery (22%). Most of the patients had no problem or delay in the treatment of patients with poly trauma at any stage probably because only two specialties were involved leading to better coordination. Problems were faced at various steps in 32 of total 210 patients. Maximum problems were faced in stage III when the referred department did not see the patient within 24 hours of information. An organized poly trauma team and a well defined standard operating procedure could be a better way to manage patients with poly trauma efficiently and effectively.

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REFERENCES

1 President's Project: Support for VAMC Poly trauma Centers (from the American Legion Auxiliary website).
2 Matar ZS. The clinical profile of poly trauma and management of abdominal trauma in a general hospital in the central region of the kingdom of Saudi Arabia. The Internet J Surg 2008; 14: 11
3 Stewart RM, Myers JG, Dent DL, Ermis P, Gray GA, Villarreal R, et al. Seven hundred fifty-three consecutive deaths in a level I trauma center: The argument for injury prevention. J Trauma 2003; 4: 66–71.
4 Kunreuther H. Risk analysis and risk management in an uncertain world. Risk Anal 2002; 22: 655–64.
5 D'Amours SK, Sugrue M, Deane SA. Initial management of the poly-trauma patient: a practical approach in an Australian major trauma service. Scand J Surg 2002; 91: 23–33.
6 American College of Surgeons Committee on Trauma. Resources for optimal care of the injured patient. American College of Surgeons, Chicago: 1999.
7 Hassan A, Tesfayohannes B. Initial assessment of the polytrauma patient. Surgery 2009; 27: 275–279.
8 Petrie D, Lane P, Stewart TC. An evaluation of patient outcomes comparing trauma team activated versus trauma team not activated using TRISS analysis. Trauma and Injury Severity Score. J Trauma 1996; 41: 870–873.
9 Sarcevic A, Burd RS. Whats the story? Information needs of trauma teams. AMIA Annu Symp Proc 2008; 6: 641–645.
10 Field K, Norton I. Australian triage tags: a prospective, randomised cross-over trial and evaluation of user preference. Emerg Med Australas 2012; 24: 321–328.

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