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Demographic study of admission pattern of trauma centre of tertiary care teaching hospital

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ABSTRACT

Emergency department is the entry point of any multispecialty or tertiary care hospital. This area is core area of any institute where all types of patients are admitted. We decided to study pattern of admission to understand workload of our ER and clue to frequently presenting conditions and readiness of our team to handle any emergency.

A study on collection of demographic data of admission in casualty of trauma centre was conducted over a period of 3 months and demographic data were collected along with provisional diagnosis, average casualty stay and severity of admission. These data were collected in retrospective pattern and manually.

Collected data were analysed by appropriate statistical software. These data were able to sort out percentage of medical and surgical admissions, also severity of condition leading to presentation to ER was obtained. Major age groups were identified which can be very helpful for allocation of recources. Observation of these study were useful for understanding the readiness and lacunae of a busy trauma center for effective management of patients. Also it gives clue to particular expertise distribution as per common presentation. It can also give insight for planning future studies in better way and to suggest preventive measures at community level for some specific diseases.

Keywords: Emergency Department, Admission, Resources Utilization, Preventive Strategies

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INTRODUCTION

Emergency room of any hospital admits all types of patients where critical status of patients ranges in severity and has lots of diversity of diagnosis and illnesses. Patient may be very critical and haemodynamically unstable or can just present for minor illness for getting treatment, outside routine hours. Patient's admissions are under various categories that range from isolated fractures to polytrauma with hypovolemic shock or minor febrile illness to septic shock. An ER has to be fully equipped to manage all type of emergencies and with skilled persons to manage all type of patients. Knowing the pattern of admission can be helpful to manage the available resources like drugs, instruments and trained person. Work distribution and availability of various super specialty doctors can also be assessed and that may be helpful in better management of patients. It is important to segregate the patient on the basis of severity and to decide which super specialty branch to be involved for definitive management.

AIMS AND OBJECTIVES OF THE STUDY

1) To Determine the pattern of admission in the emergency room
2) Ascertain the category and percentage of patients based on the type of illness on admission

3) To distribute Admissions as per respective departments
4) To understand future applications and preventive strategies

MATERIAL AND METHODS

Retrospective study was carried out in a patient who was admitted in the emergency department of tertiary care teaching hospital of Gujarat. Data was collected from the admission book of the ER of the hospital. These information was registered by ER nurse manually for hospital records. We collected data from ER register, in the form of date of admission, medico legal status, age, sex, department of admission, provisional diagnosis at the time of admission. Super specialty admissions were separated. Medical and surgical admissions were grouped accordingly. Among medical admissions, patient distribution was done under various groups according to provisional diagnosis like system involved and various aetiologies like infection, cardiovascular or poisoning cases. Results were analysed under each category to find out the percentage of admissions of each discipline. Disposition of patient from ER patient was recorded in terms of transfer to super specialty e.g. cardic, neuro, gastro intensive care or medical intensive care unit or to respective wards. Mortality events at ER level were identified.

Appropriate software was used to analyse the data and findings were discussed with suitable explanations.

Study

Total 4598 patient's data were collected over the period of 3 months.

RESULTS

Sex Ratio

Out of all total admission 4598 cases 60% where female and 40% where male admission.

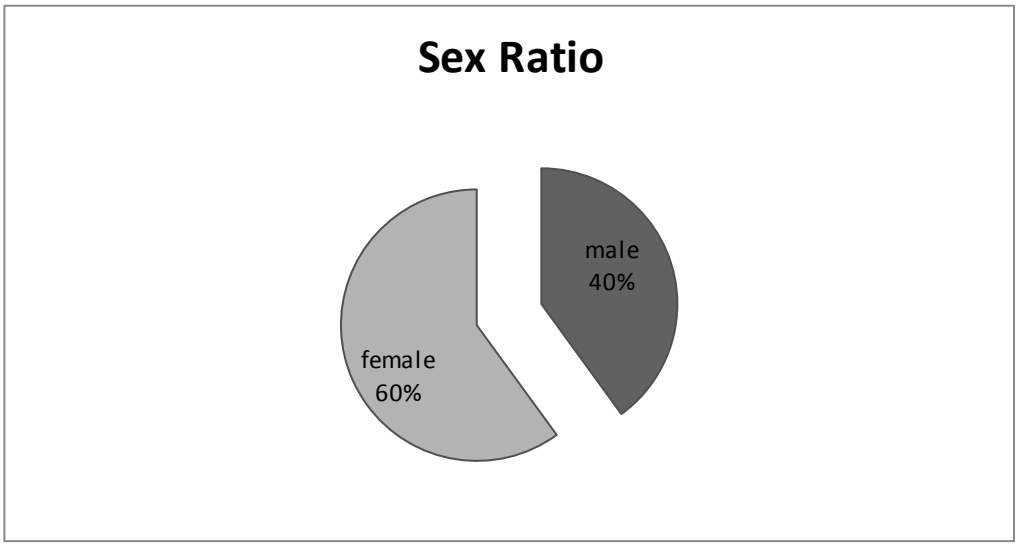


Fig 1 Sex Ratio of Admission Cases

MLC and Non MLC Cases

Out of all cases 92% case where Non MLC cases while 8% case are MLC case. Majority of MLC cases from orthopedics and neurosurgery units.

Neuromedicine department don't have any MLC admission.

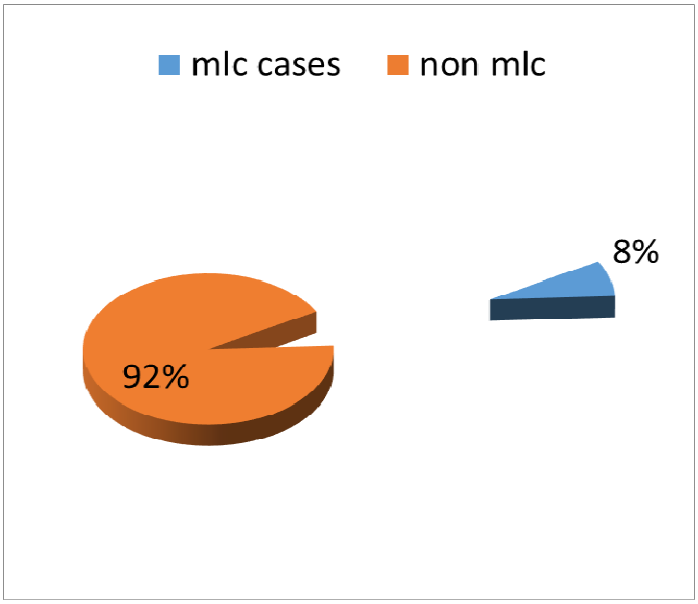


Fig 2 MLC and Non MLC Cases

Departmental Distribution

Out all that admission majority of this patients where admitted in the medicine department contains total 3093 admission less common admission where being from ENT department.

Table 1 Departmental Distribution of Cases

Department	No. of Admission
Medicine	3093
Surgery	87
Neurosurgery	887
Neuromedicine	17
Gastrology	88
Orthopedics	308
ENT	3
Cardiology	99
CVTS	13
OB & GY	1

Systemic Admission in Medicine

In other type of admission, mostly due to diabetes and endocrine system related emergency 450 cases. Pyrexia under investigation case was 650 total case. Septic shock related emergency case was 160 cases.

Medical Cases

Among medical admissions, 4.5 % were medicolegal cases where 79 % cases were of acute poisoning, while the remaining were others like electric shock, hanging and others. Among poisoning cases, 58% were males. Acid poisoning case admitted in Gastro surgical department were 26 case of acid ingestion and 17 case of phenyl ingestion and kerosene ingestion cases.

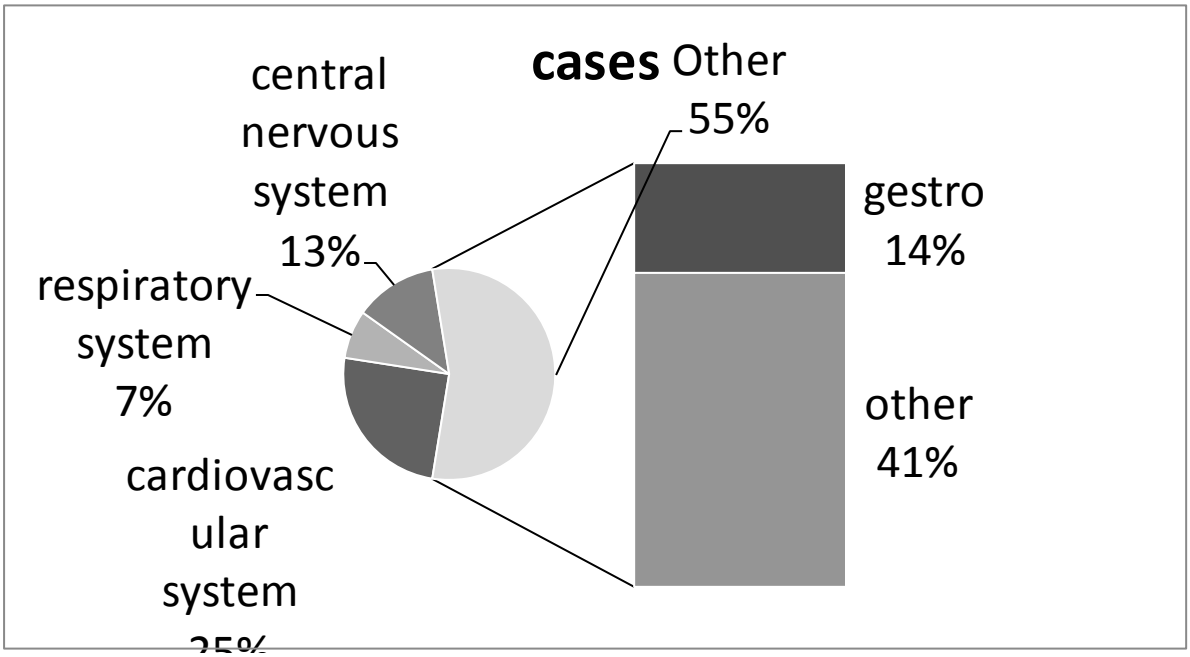


Fig 3 Systemic Admission in Medicine

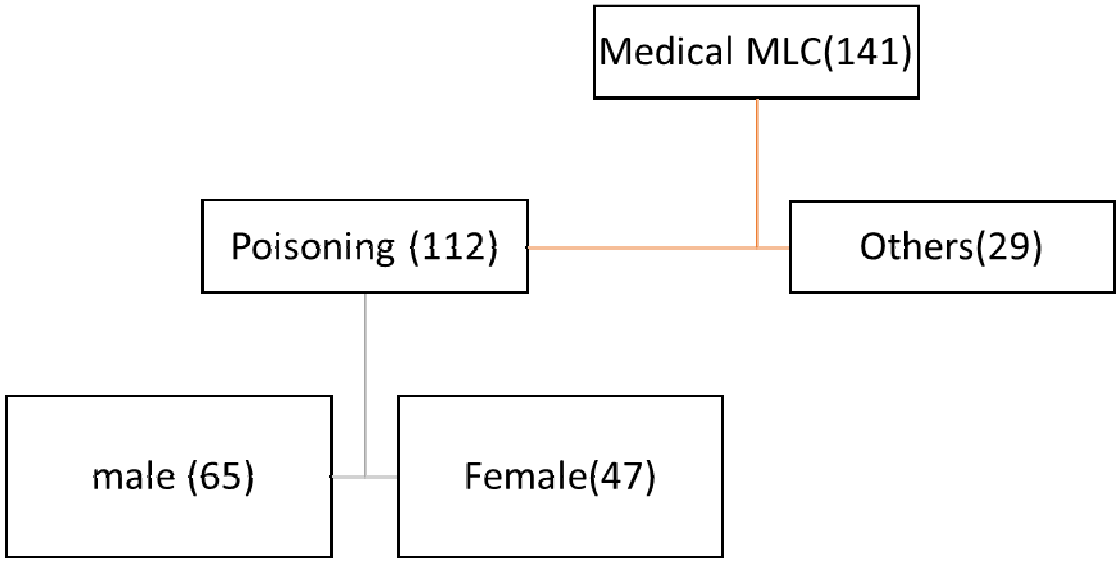


Fig 4 Distribution of MLC Cases among Medicine

Trauma Patients

A total of 1298 surgical admission were done of which 1050 admissions were due to trauma and the remaining were non-trauma patients.

Cardiac Admission

Out of all total admission, 126 cases were of acute myocardial Infarction. Out of them, less 26 cases were less than 35 years and it contains 20% of total acute myocardial Infarction case.

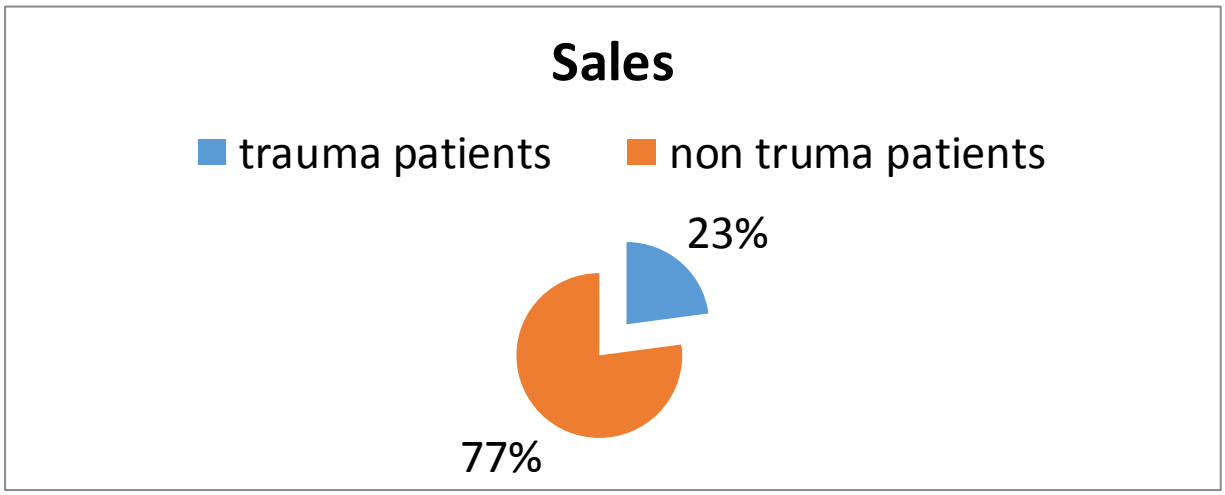


Fig 5 Trauma and Non-Trauma Patients

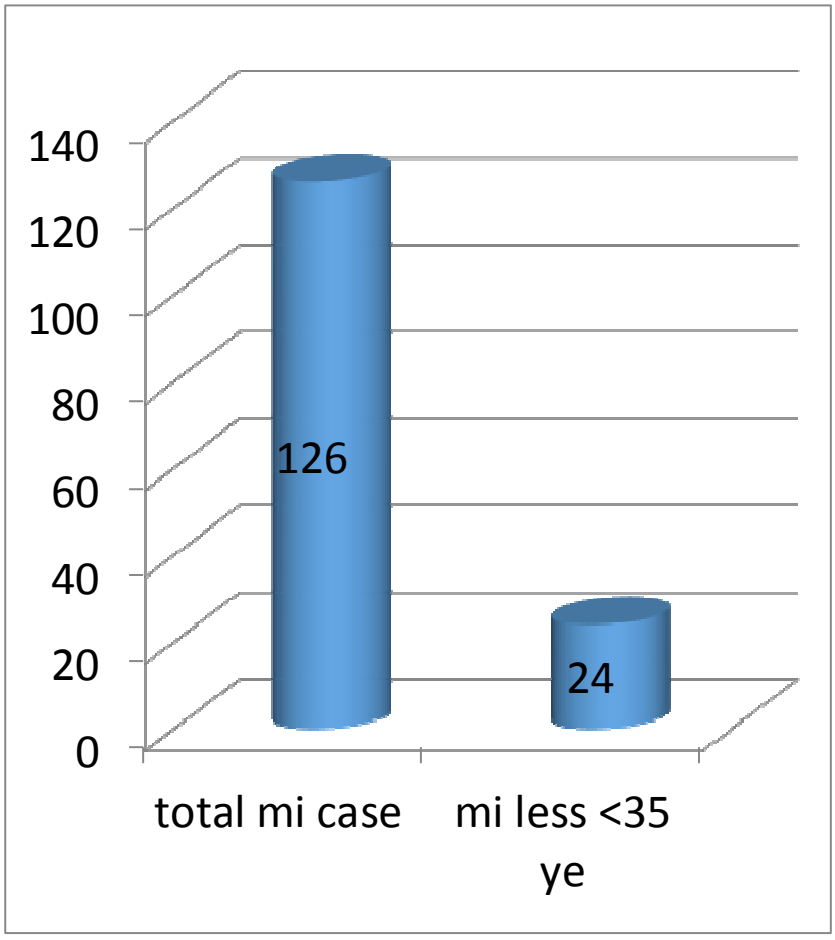


Fig 6 Total Myocardial Infraction Cases

Age Groups

One tenth (10%) of the admissions are for patients who are 70 years of age or older. Extreme age groups of patients above the age of 70 years and below the age of 15 years is total 716 (15.5%) admissions. Major age group is 15-50 year of age group which is earning population of society.

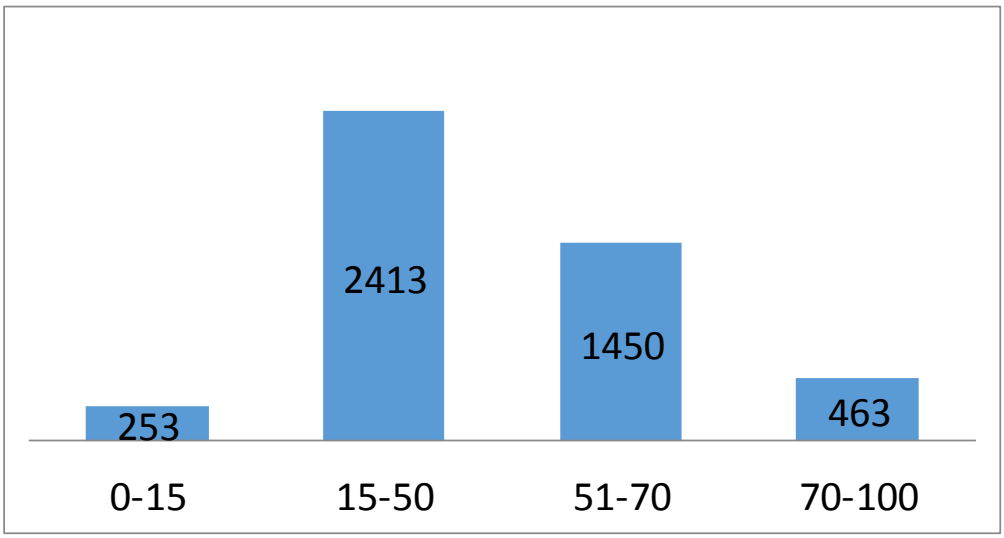


Fig 6 Age Group of Patients

Month Wise Admission

Of the total admission, the month wise admission data showed that admission in month 1 and 2 are comparatively same, whereas in month 3 there were less admission as compared to previous months.

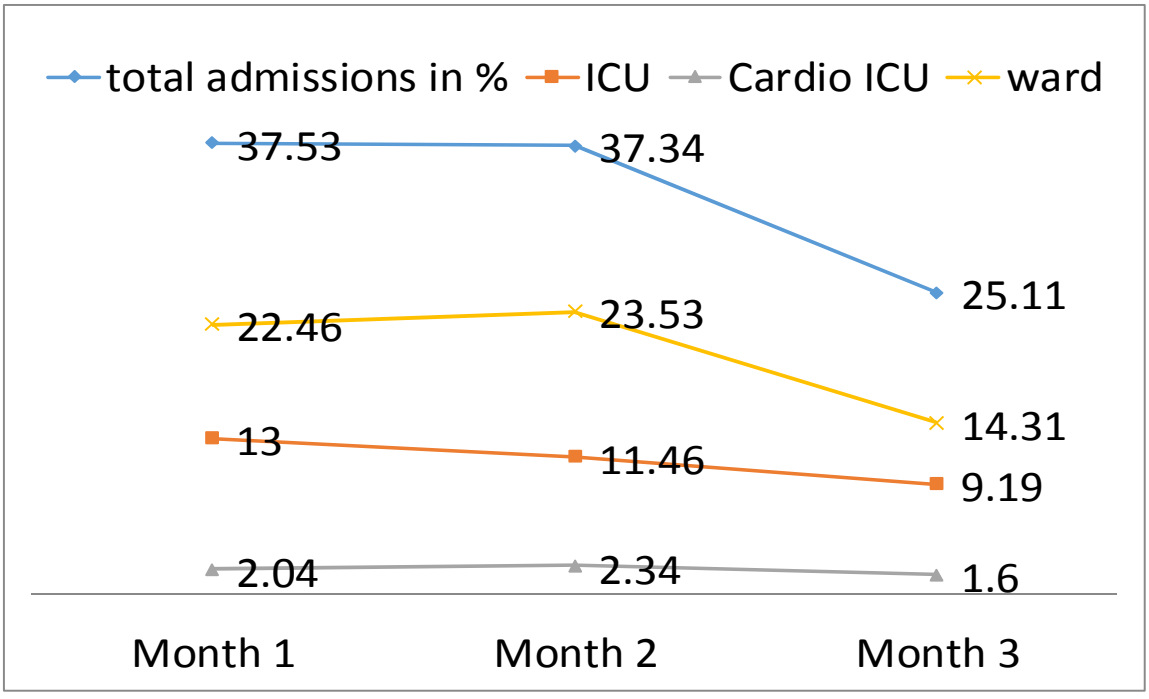


Fig 7 Month Wise Admission

Table 2 Month Wise Admission

Month	Total Admissions	ICU	Cardio ICU	Ward
Month 1	1726 (37.53%)	599 (13%)	94 (2.04%)	1033 (22.46%)
Month 2	1717 (37.34%)	527 (11.46%)	108 (2.34 %)	1082 (23.53%)
Month 3	1155 (25.11%)	423 (9.19%)	74 (1.60%)	658 (14.31%)
Total	4598	1549 (33.68%)	276 (6.0%)	2773 (60.30%)

LIMITATIONS OF THE STUDY

We have some limitations of study listed below

1) Data were collected from Manual data entry done by nursing staff.
2) Diagnosis may be incomplete at the time of admission
3) Exact duration of stay in ER could not be determined
4) Procedures at ER level and operative and non-operative cases could not be differentiated.
5) Mortality at ER level could not be obtained.

DISCUSSION

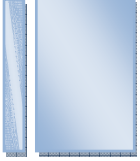
The emergency service provides the first impression on the patients and their attendances which must be a positive one. Quick and competent care can save lives and also reduce the severity and duration of illness. At the same time, an ER of tertiary care teaching hospital is the busiest area that has input of 70 to 100 patients in a day of varying severity. Various administrative issues are involved in these area in view of expert and support staff that includes security system also. Most of the time, patient presenting in ER has multiple attendants and complex behaviour in terms of psychological stress due to sudden course of events leading to admission. They might be unprepared in terms of fate of patient, attendants for critical decisions and availability of finances. Medical personnel working in ER usually faces lots of physical and emotional stress due to all these factors and not to forget the prolonged working hours and excessive workload. In recent times, Violation of hospital rules and manhandling of doctors is observed mainly in ER area.

In our study total 4598 admission in period of 3 months suggest that emergency department should be equipped with all type of resources that can deal with any type of emergency. Out of total 4598 admission 60% admission is female patient rather than male patient. Female patient history taking and examination requires availability of female nursing staff or female attendant on bedside continuously.

92 % case were non medico legal cases. Such cases require meticulous reporting to authorities' also detailed documentation of case. Also they require multiple investigations and sampling for legal purposes. Cases like assault or poisoning requires due safety conditions also along with medical management, police informing centre should be there with busy emergency room of tertiary care teaching hospital.

Out of all total admission 67% admission in the medical department in other study we also found that most of admission in the medical department.[1] An ER requires continuous availability of medical experts for accurate diagnosis and management. Availability of drugs like antidotes, thrombolytics etc should be prompt and at all times to ensure vigilant treatment.

23 % of total were trauma patients that require multidisciplinary care according to type of injuries. These patients may require multiple procedures at ER level like limb immobilization by plastering, suturing, throracocentesis etc. they may require aggressive resuscitation with intravenous fluids and blood products. Expert personal for each procedure is required including prompt securement of intravenous access. Sometimes these patients require central venous access for multiple transfusions due to non-availability of peripheral access. Facilities like emergency ultrasound and bedside radiography is to be assured in accurate time. Also CT & MRI imaging has to be in close proximity of ER to reduce the transportation associated catastrophies. Blood bank facilities are also required quite a frequent times. So



blood bank and pathology lab should be located in the trauma centre only. Investigations like toxicology panel, cardiac bio meters and arterial blood gas analysis should be available at ER level.

So compared to medical admissions one polytrauma patient require up to 7- 8 persons including medical and paramedical staffs and more than one specialty involvement at given point of time.

Medical department have 141 medico legal case admission out of them 112 cases were due to poisoning most common poisoning is organophosphorus poisoning in our region.

In our study we found that most of admission in the medical department that is similar to that study.[1]

1) Total 4598 admission 3093 admission in the medical department.[1]
2) Out of them 1549 patient shifted to the ICU which contains (33.68%) of total admissions.[1,4]
3) Head injury was the most common injury in RTA cases comprising more than 50% of the patients.[2]
4) Age group of 20-29 years was found to be the most commonly involved in RTAs highlighting the need for better safety education in this age group to reduce the incidence of RTA.[2]
5) In RTAs cases male patients are higher as compare to the female.[2]
6) 276 patient (6.0%) of total patient directly admitted or shifted to cardiology ICU units.[1]
7) 2773 of (60.30%) of total admission were shifted to general ward either medical ward or surgical ward.[3,4]
8) Least number of patient admitted in the ENT department which not similar to the study.[4]
9) Neuromedicine department have no MLC admissions.
10) As we see the age groups of the patients most of admission from earning population of the society which contains 2413 total admission in age group of 15-50 years of populations (52%).
11) One tenth (10%) of the admissions are for patients who are 70 years of age or older.[1,4]
12) Out of total 1298 surgical admissions 1050 admissions were due to trauma in overall study 77% of total admission were non traumatic admissions while 23% admission due to trauma.[4]
13) In medical admission 25% of total medical admission related to cardiac emergency as this finding is similar to the study.[3,4]
14) The other disciplines under whom large number of admissions take place from the emergency are Neurosurgery (19%), orthopaedics (6.6%) that is similar to study,[4] were other disciplines was neurosurgery and cardiology in our hospital cardiac related emergency directly admitted to medicine department then transferred to cardiology ICU so that's why cardiology admission is not matching to our study may be this is limitations of our study.
15) Head injuries from road traffic accidents resulting in intracranial bleed is the commonest neurosurgical problem.[4]
16) Admissions in month 1 and 2 are relatively same as compare to month 3 may be due to early winter season and vacation period relatively less admissions

In the United States of America studies have revealed that:[4]

1) Most admissions are routine admissions to the hospital—not through the Emergency Department.
2) However, over a third of all hospital admissions are through the Emergency Department.
3) Five of the top 10 conditions for which people are admitted through the Emergency are heart problems, like heart attack.
4) Two of the top 10 conditions are infections: pneumonia and blood infection (septicaemia).
5) Nearly 55 percent of hospital stays for the very old (80 years and older) start in the Emergency Department, compared with 45 percent for younger age groups.
6) All this above findings are similar to that our study.[2,4]

7) Total pediatric admission in our study is 5.5% of total admission paediatric department have another admission table other than emergency room in our hospital only paediatric trauma patients are admitted in the emergency room in other study [5,7] most of the paediatric admission were due to the acute respiratory distress.
8) Extreme age groups of patients above the age of 70 years and below the age of 15 years is total 716 (15.5%) admissions.[6]
9) The pattern of admission can be helpful to manage the available resources like drugs, instruments and trained persons.
10) Work distribution and availability of various super specialty doctors can also be assessed and that may be helpful in better management of patients.
11) It is important to segregate the patient on the basis of severity and to decide which super specialty branch to be involved for definitive management.
12) We can improve our data entry by Single website for hospital admission patient with unique number with time that is connected with one hospital server with single window system that is better way to data entry than manual data entry than nursing staff that data can be rapidly obtain for any further study and planning.

PREVENTIVE STRATEGIES

Delivering high quality health service by emergency room is achieved through the implementation of continuous quality improvement. Quality improvement is now a driving force in health care and is an essential aspect of service delivery at all levels. We can prevent cardiac admissions by:

1) Primary preventions measures and identification of high risk age groups like above the age of 45 years and continuous medical education, continuous OPD follow up of patients prevent accidental events like accelerated hypertensions, periodic diabetes camp may prevents diabetics emergency in emergency room.
2) In our study 26 MI case were less than 35 year of age which is significant and informing to higher centre to prevent risk factor of coronary artery diseases, modifications of life style, avoid smoking, stress, junk food may decrease incidence of acute coronary events.
3) Strict traffic rule and compulsory helmets in two wheelers and seat belts in four wheels may prevents road traffic accidents.
4) Education of public to basic life support is important role in society and may prevents death due to sudden cardiac arrest.
5) Emergency medical transport services like 108 and other ambulance connection to emergency room help to assign resources and arrangement of instruments before the arrival of patients.
6) One application that developed by government of India SUCHANA app that is app that provide information like type of injury of arriving patient to nearest trauma centre.
7) In today's world of advanced technology, it is vital to set up trauma registry. Such registry is already available in high-income group countries while in low-income group countries trauma registry is virtually non-existent and in fact, more trauma victims are seen in these countries.[2]

REFERENCES

1. Karim MZ, Hansen EL, Ahmad BU, Lahiry S A retrospective study of illness and admission pattern of emergency patients utilizing a corporate hospital in Dhaka, Bangladesh : 2006 -2008, The ORION Medical Journal 2009 May;32(2):650-653
2. Rishidev A, Gupta SD, Musa R, Bhavsar N, Thakor A, Patel P. Profile of Nonfatal Injuries in Road Traffic Accidents Cases Treated at a Tertiary Level Trauma Centre. Int J Sci Stud 2016;4(6):36-40.
3. Vasnaik M. Emergency Medicine Department - operational essentials for effective implementation in: Gupta S, Parmar NK, Kant S. Editors, Emergency Medical Services & Disaster Management - A Holistic Approach. 1st ed. New Delhi Jaypee Publishers; 2001; 38-48.
4. Chattoraj A, Satpathy S. A Study of Sickness & Admission Pattern of Patients Attending an Emergency Department in a Tertiary Care Hospital. Journal of the Academy of Hospital Administration. 2006; 18(1);01-12.
5. Elixhauser A, Yu K, Steiner C, Bierman AS. Hospitalization in the United States, HCUP Fact Book No. 1, 1997.

6. Chik Loon Foo,kim Chai Chan,hsin Kai Goh.profiling Acute Presenting Symptoms Of Geriatric Patients Attending An Urban Hospital Emergency Department.june 2009,vol. 38 No.6.
7. Salaria M, Singhi S. Profile Of Patients Attending Pediatric Emergency Service At Chandigarh. The Indian Journal Of Pediatrics. 2003;70(8):621-624.
8. Evaluation of acute poisoning in emergency department : A clinico epidermiological study tertiary care teaching hospital of Gujarat NJIRM -2017-09-095