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Original Research Article

Evaluating and Reporting the Incidence, Prevalence and Provoking Factors to Admit in Emergency Medicine Department of a Tertiary Care Teaching Hospital: A Prospective Observational Study

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Conflict of interest: Nil

Abstract:

Background: Emergency Medicine Department (ED) is a primary contact for medical care in critical cases. The core purpose of acute medical care is to stabilize the patient suffering with a life threatening (or) limb threatening injury or illness. There are numerous provoking factors to seek admission in ED like Social factors (smoking, alcohol, drug abuse, economic status, occupation); Psychological factors (suicidal thoughts, stress, anxiety, depression, isolation and intellectual disability); Genetic factors and Dietary factors. On an average, the incidence of emergency cases is 47 per 100 visits to a tertiary care teaching hospital.

Aim: To evaluate and report the Incidence, Prevalence and Provoking factors to admit in Emergency Medicine Department of a tertiary care teaching hospital: A Prospective Observational Study.

Methodology: A Prospective observational study was carried out in Emergency Medicine Department, Government General Hospital, Guntur for a period of 6 months i.e., 1st September 2022 to 28th February 2023 after obtaining approval from Institutional Ethics Committee. The patients were screened based on inclusion and exclusion criteria. Patients who satisfy criteria were included in the study after obtaining informed consent. The data was collected in designed data collection forms. The patient demographics, past history, provoking factors, MLC and non-MLC cases were taken and assessment of incidence, prevalence was done.

Results: Majority of the patients were found Non-medico legal cases (71.4%) compared to Medico legal cases (28.6%). Incidence of Inflammatory/Infectious disease (38.2%) is more and the Prevalence is also high for Inflammatory/Infectious disease (49%) (P=<0.00001). Most of the accidents were seen in those using a 2-wheeler (81.73 %) than those using a 4- wheeler (16.12 %), 3- wheeler (2.15 %), most accidents occurred in patients whose driving speed limit is > 50 kmph (76.93 %) compared to those whose driving speed limit is < 50 kmph (23.07 %).Majority of them have no helmet (94.7 %) and the others have a helmet (5.3 %).We also Witnessed that the mortality was high in vascular diseases (40 %) followed by those in inflammatory/infectious (37.5 %) then in traumatic cases (20 %) and the least in neoplastic (2.5 %).

Conclusion: From our study we conclude that patients of age group 36-45 were shown higher prevalence of admission in the ED in both MLC and non-MLC. Recurrent diseases have the high prevalence rate compare to the non-recurrent diseases. Non-communicable diseases have the high prevalence rate compare to the communicable diseases. On tabulation of results for speed of vehicle and helmet, speed >50Kmph has shown high prevalence rate and no helmet usage has shown high prevalence rate. The option for Ambulance and First-aid was low. Life saving techniques like CPR has lower utilization compare to dialysis. Our study concludes that by counselling the patient about dietary factors, life style modifications and measures to prevent Road Traffic Accidents (RTA) and poisonings which are contributing to admit in ED could help the patient in improving the patient's health status and reduces the occurrence of RTA and poisonings. We also have seen the pivotal role of awareness of First- aid and Ambulance among the patients regarding to quality of life.

Keywords: Emergency Medicine Department, Medico Legal Cases, Non-Medico Legal Cases, First-aid.

Introduction

An Emergency Medicine Department (ED), also known as an Accident and Emergency Department (A&E), Emergency Room (ER), Emergency Ward (EW), or Causality Department,[1] is a type of medical treatment facility that specialises in Emergency Medicine. Acute care is provided in an ED for patients who arrive without an appointment, either on their own initiative or via Ambulance. In a hospital or other primary care centre, the Emergency Room is normally found.[1] The department must provide first care for a variety of illnesses and injuries because patient presence is unanticipated; some of these conditions may be life-threatening and necessitate rapid intervention. In several countries, Emergency Departments have developed into important entry points for patients without other means of accessing healthcare.[1]

Emergency Medicine Department is a primary contact for medical care in critical cases.[2] The main goal of acute medical care is to stabilize the patient who is afflicted with a disease or injury that poses a threat to life or limb.[2] The greatest medical or surgical care is given to patients who are in need of immediate care in ED, which are an essential component of hospitals and medical practices. The Emergency Room (ER) is the most important and intense department at a hospital since, frequently, life and death are in doubt.[2]

Emergency Rooms are becoming a crucial element of medicine's front line. The appropriate mix of strategy, technology, and advancement leads to satisfaction, lowers death rates, and boosts productivity.[3]

However, depending on the country and region, different healthcare professionals, such as paramedics and doctors, may perform the triage sorting. In the majority of departments, a triage nurse fills this position. Triage may be carried out over the radio with an ambulance crew, in which case the paramedics will call the hospital's triage centre with a brief update about an incoming patient, who will then be triaged to the proper level of care.[2,3]Triage is typically carried out face-to-face when the patient presents. The majority of patients will first undergo a triage evaluation before being sent to another region of the hospital or department, depending on their clinical needs.[4]

A hospital's emergency department is a specially designated space that is organized and managed to offer high-quality emergency care to members of the public who believe they require immediate or acute care, including hospital admission. Patients who display symptoms of a serious illness but do not now pose a threat to their life or limb will be given priority for "acute care" or "majors," where they will visit a doctor and receive a more complete evaluation and treatment.[4] Chest pain, respiratory problems, gastrointestinal pain, and neurological issues are a few examples of "majors." At this point, advanced diagnostic procedures like Ultrasonography, CT, or MRI scanning, as well as laboratory blood and/or urine testing, may be used. Additionally, the patient will receive the right medications to control their illness. The patient may be sent home from this location or admitted to the hospital for additional treatment, depending on the underlying causes of the major complaint.[5]

An individual's risk of an ED visit in each hour is small. It will likely fluctuate over time as a function of known factors and will also vary among people.

The purpose of present study is to assess and report the incidence, prevalence and provoking factors to admit in ED and for better understanding of mode of trauma, severity of illness, therapeutic outcomes of the patients and thereby educating the patients accordingly to minimize the hospital stay.

Aim:

To evaluate and report the incidence, prevalence and provoking factors to admit in ED of a tertiary care teaching hospital.

Materials and Methods

Study Design:

A prospective observational study

A Prospective Observational Study conducted in Emergency Medicine Department, collected data from all emergency areas (Triage, resuscitation bay, red zone, yellow zone, green zone, blue zone, isolation area, emergency medical ICU, disasters prepared ness area) with the help of data collection form, consent form we collected the data and entered into the MS ADVANCED EXCEL 2010. The study conducted with in the duration of 1st September 2022- 28th February 2023 in Government General Hospital, Guntur which included a 500 patients, the data collected was analysed statistically using Graph Pad Prism

Study Period:

The study is conducted for 6 months from 1st SEPTEMBER 2022 to 28th FEBRUARY 2023.

Inclusion Criteria:

- Age greater than 15years and less than 80 years of age.
- All medico legal and non-medico legal cases coming to the emergency medicine department, acute medical care units

Exclusion Criteria:

- Age > 80 years and < 15 years
- Refusal to participate

- Unable to provide informed consent forms
- Pregnancy / breast feeding women
- Psychologically disabled patients

Study Method: This study was conducted in Government General Hospital, Guntur Government Medical College, Guntur. This study involves all the subjects who are included in the inclusion and exclusion criteria. Subjects are observed for their provoking factors, incidence and prevalence of emergency case. An informed consent form will be taken from the patient. We will compare the data obtained and report the outcomes. The patient data will be analyzed, tabulated and graphically represented by using the statistical tools (SPSS software).

Statistics: A total of 500 patients were screened to include the subjects in the study. The following results were tabulated and analyzed using specific statistical tools. Descriptive data was expressed as percentage and for Continuous data Chi-Square test and ANOVA tests were used.

Results

Majority of the patients were found Non-medico legal cases (71.4%) followed by Medico legal cases (28.6%). Age groups of 15 to 80 years. Majority of patients were found within 36-45 years (24%) in which Non-MLC were more compared to MLC followed by 46-55 years (23.8%) in which Non-MLC were more compared to MLC, 56-65 years (18.6%) in which Non-MLC were more compared to MLC , >65 years (13.2%) in which Non-MLC were more compared to MLC, 26-35 years (11.8%) in which MLC were more compared to Non-MLC and 15-25 years (8.6%) in which Non-MLC were more compared to MLC.

Risk factors:

Male patients (71 %) were more with Non-MLC being high compared to MLC, then female patients (29%) with more Non- MLC cases than the MLC cases. Most of the patients were found to be daily wage workers (62.6 %) where majorly there are Non-MLC cases compared to MLC cases followed by housewives (14.8 %) where most cases seen were Non- MLC than the MLC cases then agriculture (10.8 %) where most of them were Non-MLC than the MLC and then employees (6 %) where comparatively many were MLC cases than Non-MLC cases and the least being students (5.8 %) where Non-MLC cases were higher than MLC cases.

Risk factors distribution with respect to category:

Majority of the patients were found having Clinical/Pathological factors (51.8%) in which Non-MLC were more compared to MLC with respect to Category and 46-55 yrs were more followed by 56-65 yrs, 36-45 yrs, >65 yrs, 26-35 yrs and 15-25 yrs with respect to Age and Males were more compared to Females with respect to Gender.

Existing Diseases

Majority of the patients's disease were found Inflammatory/Infectious (49%) in which new cases were more compared to old cases followed by Traumatic (30%) in which new cases were more compared to old cases, Vascular (20.4%) in which old cases were more compared to new cases and Neoplastic (0.6%) in which old cases were more compared to new cases. It also shows Traumatic cases were more in <45yrs and Inflammatory/ Infectious diseases were more in >45yrs in new cases whereas Inflammatory/Infectious diseases were more in <45yrs and Vascular were more in >45yrs in old Cases.

Table 1: Disease vs number of patients

S. No	Disease	No. of patients				Total Percentage
		New Cases		Old Cases		
		<45 yrs	>45 yrs	<45 yrs	>45 yrs	
1.	Vascular	11	12	23	56	20.4%
2.	Inflammatory/ Infectious	54	137	25	29	49%
3.	Traumatic	91	57	2	0	30%
4.	Neoplastic	0	0	2	1	0.6%

Number of patients & geographical distribution:

Majority of the patients were found within Guntur district (78%) followed by Prakasam district (10.6%), Krishna district (3.2%), West Godavari district (2.4%), Palnadu district (1.8%), Bapatla district (1.8%), Kurnool district (0.6%), Nalgonda district (0.4%), Warangal district (0.4%), Srikakulam district (0.2%), East Godavari district (0.2%), Nellore district (0.2%) and Kadapa district (0.2%) .

Social habits differentiation: Majority of the patients were found Non-smokers (60.6%) compared to Smokers (39.4%), Non-alcoholics (60.6%) compared to Alcoholics (39.4%) and Non-drug abusers (96.2%) compared to Drug abusers (3.8%).

Table 2: Social habits Vs number of patients

S. No	Social habits		No. of patients	Percentage
1.	Smoking	Smokers	197	39.4%
		Non-smokers	303	60.6%
2.	Alcohol	Alcoholics	244	48.8%
		Non-alcoholics	256	51.2%
3.	Drug Abuse	Drug abusers	19	3.8%
		Non-drug abusers	481	96.2%

Majority of the patients were found Non-smokers without alcohol (45.4%) followedby Smokers with alcohol (33.2%), Non-smokers with alcohol (15.6%) and Smokers without alcohol (5.8%).

Vital parameters: Majority of the patients were found Hypothermic (75.8%) followed by Normal (15.2%) and Hyperthermic (9%) in comparisions of Body Temperature. By comparing Blood pressures, Hypertensive patients (55.6%) were more followed by Hypotensive (27%) and Normal (17.4%). By comparing Respiratory rate, more patients were found >16 cycles/min (81.2%) followed by 16 cycles/min (14%) and <16 cycles/min (4.8%). By comparing Pulse rate, more patients were found >80 beats/min (82.8%) followed by <80 beats/min (10.4%) and 80 beats/min (6.8%).

Table 3: Vital parameters Vs number of patients

S.No	Vitals		No. of patients	Percentage
1.	Body temperature (^{0}F)	<98.6	379	75.8%
		98.6	76	15.2%
		>98.6	45	9%
2.	Blood pressure(mmHg)	<120/80	135	27%
		120/80	87	17.4%
		>120/80	278	55.6%
3.	Respiratory rate (cycles/min)	<16	24	4.8%
		16	70	14%
		>16	406	81.2%
4.	Pulse rate (beats/min)	<80	52	10.4%
		80	34	6.8%
		>80	414	82.8%

Pupils among patients: Table-11 depicts the information regarding distribution of patients based on Pupils. Majority of the patients were found Normal pupils (98.2%) followed by Constricted pupils (1%) and dilated pupils (0.8%).

Disease recurrence: The occurrence of the disease where the recurrent diseases (53.6 %) weremajorly seen followed by the non- applicable ones (30.4 %) and the least accounting for those non- recurrent diseases (16 %).

Disease spread ability: The most were the non-communicable diseases (61 %) and the least being the communicable diseases (9.2 %) and the others are neither of these, being not applicable (29.8 %).

Table 4: Accident factors over the patients

S .No	Trauma		No. of patients	Percentage
1.	Type of case	RTA	93	18.6 %
		Non- RTA	407	81.4 %
2.	Vehicle usedin RTA	2-wheeler	76	81.73 %
		3-wheeler	2	2.15%
		Pedestrian	15	16.12 %
3.	Speed of thevehicle	>50 kmph	60	76.93 %
		<50 kmph	18	23.07 %
4.	Helmet used	Yes	4	5.3 %
		No	72	94.7 %

Mode of transport used by the patients: Mostly own transport (62%) was opted compared to ambulance (38 %). Mostly own transport (62 %) was opted compared to ambulance (38%).

Majorly no first aid is given (88 %) and the rest of them were provided with the first aid (12 %).

Life-saving techniques utilization: Majorly provided was artificial nutrition and hydration techniques (29.6 %) followed by mechanical ventilation (25%), followed by the dialysis (19.2

%) and then M/A resuscitator (14.6 %) and the least is the CPR (11.6%).

Table 5: life saving techniques vs no. of patients

S. No	Life-saving techniques	No. of patients	Percentage
1.	CPR	58	11.6 %
2.	Dialysis	96	19.2 %
3.	M/A resuscitator	73	14.6 %
4.	Mechanical ventilation	125	25 %
5.	Artificial nutrition and hydrationtechniques	148	29.6 %

Length of stay: Majority of the patients were found 1-5 days (61%) followed by 6-10 days (33.4%) and 11-15 days (5.6%). The mortality was high in vascular diseases (40 %) followed by those in inflammatory/infectious (37.5 %) then in traumatic cases (20 %) and the leastin neoplastic (2.5 %).

Table 6: Mortality vs number of patients

S. No	Mortality	No. of patients	Percentage
1.	Vascular	16	40 %
2.	Inflammatory/infectious	15	37.5 %
3.	Traumatic	8	20 %
4.	Neoplastic	1	2.5 %

Discussion

Our study main objective was to evaluate Incidence, Prevalence and Provoking factors to admit in ED.

The information regarding distribution of patients with in cases. Majority of the patients were found Non-medico legal cases (71.4%) compared to Medico legal cases (28.6%). Based on the results obtained, current study reveals that Majority of patients were found within 36-45 years (24%) in which Non-MLC were more compared to MLC followed by 46-55 years (23.8%) in which Non-MLC were more compared to MLC, 56-65 years (18.6%) in which Non-MLC were more compared to MLC, >65 years (13.2%) in which Non-MLC were more compared to MLC, 26-35 years (11.8%) in which MLC were more compared to Non-MLC and 15-25 years (8.6%) in which Non-MLC were more compared to MLC. Males (71%) were contributed more in admission of ED than Females (P=0.0003). Daily wage workers (62.6%) were higher in number than any other occupation in which Non- MLC were more compared to MLC (P=0.0002).

Sung-Wei Liu study results showed that Male gender (odds ratio [OR] = 1.44), ambulance transport at return visit (OR = 3.68), senior staff (OR = 1.52), work-up (OR = 3.03), and longer length of stay (LOS) were associated with higher risks of admission among ED 72-h return visits. Age, comorbidity, mode of transport at index visit, consultation, triage, type of illness, OPD visit between ED visits, and interval between index and return visits were not significantly associated with return admission.

They concluded that gender, mode of transportation, staff experience, check-up, and length of stay (LOS) are associated with ED return admission.[6] With regarding our results Incidence of Inflammatory/Infectious disease(38.2%) is more and the Prevalence is also high for Inflammatory/ Infectious disease (49%) (P=<0.00001). Majority of the patients were found having Clinical/Pathological Risk factors (51.8%) in which Non-MLC were more compared to MLC (P=0.000335) with respect to Category and 46-55 yrs were more followed by 56-65 yrs, 36-45 yrs, >65 yrs, 26-35 yrs and 15-25 yrs with respect to Age and Males were more compared to Females with respect to Gender.

Prabhakar Abhilash et al studied the Profile of trauma patients in the emergency medicine department of a tertiary care hospital in south India. They depicts about the mode of trauma, severity of injuries, and outcome of trauma victims in ED. About 16,169 patients attended during the 3-month study period with 10% (1624/16,169) being adult trauma incidents. The gender distribution was 73.6% males and 26.4% females. The mean age was 40.2 ± 16.7 years. The average number of trauma incidents increased by 28% during the weekends. Road traffic accident (RTA) (65%) was the most common mode of injury, followed by fall on level ground (13.5%), fall from height (6.3%), work place injuries (6.3%), and others. Traumatic brain injury was seen in 17% of patients while 13.3% had polytrauma with two-wheeler accidents contributing to the majority. The study has concluded that RTA and falls are the predominant causes of trauma. [5]

In our study, majority of the patients were found Non-smokers (60.6%) compared to Smokers (39.4%) and Non-alcoholics (60.6%) were high compared to Alcoholics (39.4%) and Non-drug abusers (96.2%) were more compared to Drug

abusers (3.8%). With association of smoking with alcohol most number of patients were belongs to Non-smokers without alcohol (45.4%) followed by Smokers with alcohol (33.2%), Non-smokers with alcohol (15.6%) and without smokers.

Elizabeth G. Clark, et al., study states that the Eemergencies such as road traffic accidents (RTAs), acute myocardial infarction (AMI) and cerebrovascular accident (CVA) are the most common causes of death and disability in India. The majority (67.14%, n=803) were adults, while only 3.85% (n=46) were infants. The most common chief complaints were fever (21.5%, n=257), renal colic (7.3%, n=87), and Dyspnoea (6.9%, n=82). The most common ED diagnoses were gastrointestinal (15.5%, n=185), pulmonary (12.3%, n=147), tropical (11.1%, n=133), infectious disease and sepsis (9.9%, n=118), and trauma (8.4%, n=101). The study had concluded that the obtained data from patient can help guide and shape Indian EM training programs and faculty development to more accurately reflect the burden of acute disease in India.[7]

Our study reveals that Hypothermic (75.8%), Hypertensive patients (55.6%), >16 cycles/min of Respiratory rate (81.2%) and >80 beats/min of Pulse rate (82.8%) contributes more to admit in ED. Patients with normal pupil size (98.2%) are more than constricted and dilated pupils.

Recurrent diseases (53.6%) shows higher rate than Non-recurrent diseases. Our study also reveals Non-communicable diseases (61%) were taken a larger part in the admission of ED.

Most of the accidents were seen in those using a 2-wheeler (81.73%) than those using a 4- wheeler (16.12 %), 3-wheeler (2.15 %), most accidents occurred in patients whose driving speed limit is > 50 kmph (76.93 %) compared to those whose driving speed limit is < 50 kmph (23.07%). Majority of them have no helmet (94.7 %) and the others have a helmet (5.3 %).

Santosh K.S, et al., conducted a study on Analysis of various retrospective poisoning cases in tertiary care Hospital in Tamil Nadu. They stated that acute poisoning is an important cause of morbidity and mortality which is increasing day by day in developing countries.

Out of these 261 cases 150 were males and 111 were females. Poisoning was common in the age group of 21-35 years which was 178 cases and in the range of 5-21 years were 43 cases. The poison consumed were as follow(s): Oleander seeds 60 cases, Snake bite 52 cases, Food poisoning 42 cases, Organophosporous 37 cases, All out 13 cases, Multi tablet 10 cases, Benzodiazepine and HIT 6 cases, Rodenticide 7 cases, Hair dye 5 cases, Antipsychotic, Endosulphan and scorpion bite 3 7. cases, Inhalational and Pain killer 2 cases, Cetrizine, Insulin, Petrol and Savlon liquid 1 cases and unknown 4 cases. 60.92% were suicide and 39.08% accidental, mortality rate were 0.4%. Establishment of strict policies against the sale and easily availability of pesticides and over the counter drugs is an effective way to control organophosporous and drug poisoning.[8]

Our study results were in concordance with the study done by Nasrin S. Saiyed, et al concluded that contribution to the road traffic pollution were use of mobile phones while driving the vehicle, during excessive speed limit, irregularity in maintaining the vehicle, attempt to pass other vehicles and not following the traffic rules.[9]

Unlikely own transport (62%) is opted compared to ambulance (38 %). no first aid is given (88 %) was ultimate. Our study depicts usage of artificial nutrition and hydration techniques (29.6 %) followed by mechanical ventilation (25 %) then the dialysis (19.2%) and then M/A resuscitator (14.6%) and the least is the CPR (11.6 %) regarding life-saving techniques. We also found that length of stay of 1-5 days were more (61%) followed by 6-10 days (33.4%) and 11-15 days (5.6%) (P=<0.00001).

We also Witnessed that the mortality was high in vascular diseases (40%) followed by those in inflammatory/infectious (37.5%) then in traumatic cases (20%) and the least in neoplastic (2.5).

Accidents (RTA), Acute Myocardial Infarction (AMI) and Cerebrovascular Accidents (CVA) are the most common causes of death and disability. Our study thereby evaluates the Incidence, Prevalance and Provoking factors to admit in ED also co-relates to various factors like First-aid knowledge of patients, Mode of transport and the importance of Helmets and Seat belts.

Conclusion

From our study we conclude that patients of age group 36-45 were shown higher prevalence of admission in the ED in both MLC and NON MLC. Alteration of vitals can be majorly seen in the admitted patients. Inflammatory or Infectious diseases are found to be high prevalence diseases in age group of >45years. On the other hand Daily wage workers contribution ismore in the admission of ED. Smoking association with alcohol is high in more number of patients. Recurrent diseases have the high prevalence rate compared to the non-recurrent diseases. Non- communicable diseases have the high prevalence rate compared to the communicable diseases. On tabulation of results for risk factors associated with age groups, gender and type of case, clinical/ pathological risk factor has shown higher prevalence rate. Vascular diseases have high mortality rate compare to traumatic, inflammatory/ infectious, and neoplastic. On

tabulation of results for speed of vehicle and helmet, speed >50Kmph has shown high prevalence rate and no helmet usage has shown high prevalence rate. The optation of Ambulance and First-aid is low. Life saving techniques like CPR has lower utilization compare to dialysis.

Our study concludes that by counseling the patient about dietary factors, life style modifications and measures to prevent Road Traffic Accidents (RTA) and poisonings which are contributing to admit in Emergency Department could help the patient in improving the patient's health status and reduces the occurrence of RTA and poisonings. We also have seen the pivotal role of awareness of CPR, First- aid and Ambulance services among the patients regarding to quality of life.

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