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A STUDY OF DRUG UTILIZATION IN EMERGENCY MEDICINE DEPARTMENT IN TERTIARY CARE HOSPITAL

Emergency Medicine

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ABSTRACT

Introduction– Studies on drug utilisation in Emergency Medicine department are needed to evaluate compliance to recommended guidelines and to rationalise the drug usage. However, studies in tertiary care centres show a varying pattern in disease burden and drug use. Hence a survey was conducted in the emergency medicine department on Drug utilisation, understand medication patterns, disease prevalence, polypharmacy, and alignment with national drug policy. **Methodology-** This was a prospective observational study, documenting patient demographics, diagnosis, medications, dosage form and whether drugs were prescribed by generic or brand names. Prescribing patterns were analysed and compared to WHO indicators. **Results-** In 160 encounters, 95 males and 65 females. Majority were young (21-40 years), were admitted, mainly due to trauma [30(18.75%)] and then gastrointestinal problems [29(18.12%)]. IV fluids (88.74%) were the top prescribed .Intravenous was the most common route. On average, 4.15 medications were prescribed per encounter. Out of 665 drugs, 31.87% were generic and 78.94% were essential drugs. **Conclusion-** The study indicates that our drug prescribing practices do not fully meet the WHO prescribing indicators, suggesting a need for healthcare providers to work together to ensure compliance with WHO's drug use standards.

KEYWORDS

Drug Utilization, Emergency Medicine, Tertiary Care Centre.

INTRODUCTION:

One of the integral parts of pharmaco-epidemiologic study is drug utilization (DU) study. Drug utilization studies describes extent, nature and determinants of drug exposure[1] and has been defined as the marketing, distribution, prescription and use of drugs in a society with special emphasis on the resultant medical and social consequences[2]. Irrational use of drugs suggested by various studies warrants the need for imposing stringent regulatory measures[3].

DU pattern is required to provide adequate basis for improving drug therapy[4] and assess drug needs in an area. The indicators of prescribing practices given by World Health Organization (WHO) measure the performance of health care providers in several key dimensions related to the appropriate use of drugs. These indicators can be observed prospectively, from a group of patients attending the health facility the day the data are collected[5].

Emergency Medicine Department (ED) is the first go to place, after routine day care hours for patients facing medical emergencies. It sees an influx of patients from all specialities irrespective of age and gender with varying urgency and severity. This presents unique challenges to the treating physicians who have to work within a very short time frame, make an empirical diagnosis and provide empirical treatment. Survey on DU in the ED is important not only for the physician to evaluate whether recommended guidelines have been followed, it also helps to rationalise the medicine usage which would be beneficial in our developing country with a heavy load of patient presenting to the emergency department[1].

Studies in other tertiary care centres show a varying pattern in terms of both disease burden and drug use. Hence it is imperative that institutes are aware of the prevalent disease burden and drug utilization pattern within their ambit[1, 4]. With this purpose in mind the current study was conducted to study drug utilization within emergency medicine department, at a tertiary care hospital (TCH) with ultimate goal to understand use of drugs and the disease burden and to measure the degree of poly-pharmacy among the prescribers and to measure the degree to which practices conform to a national drug policy.

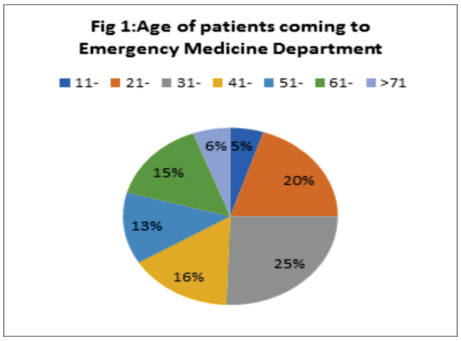
METHODOLOGY:

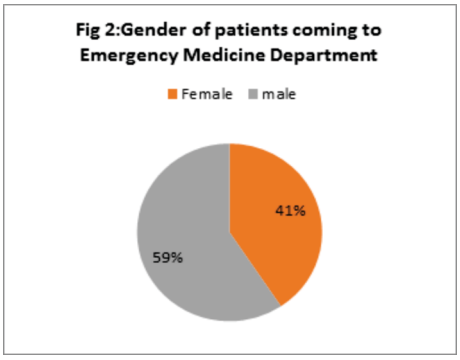
This was a prospective observational study carried out after ethics committee approval. Prescriptions of all patients visiting ED of TCH during a period of one month and willing to give informed consent were included in the study.

Data like gender, age, diagnosis made by treating physicians, drug related information like name of drug, number of drugs prescribed, drug dosage form, antibiotics prescribed, drug prescription by generic or brand names, drugs prescribed from National Essential Drug List was noted for each encounter(one encounter equals one prescription). A fixed dose combination (FDC) was considered as a single drug. The most common condition treated was identified. The current pattern of drug utilization was studied and the prescribing indicators as per WHO was calculated[3].

RESULTS:

In our study, 160 encounters with patients from the ED were reviewed. Out of which 95 were males and 65 were females. 41(25%) patients belonged to the age group 31-40, followed by 32(20 %) belonged to 21-30 years age, 25(16%) to 41 – 50 years, 24(15%) to 61-70 years, 21(13%) to 51-60 years, 9(6%) belonged to more than 71 years and 8(5%) belonged to 11-20 years





Trauma(30) was the most common presentation to the Emergency Room followed by gastrointestinal (GI) system involvement(29), miscellaneous(21), respiratory system, central nervous system and toxicology as observed from table 1.

In trauma, traumatic brain injury was commonly seen and in the miscellaneous group, acute febrile illness was commonly seen. In GI system, acute gastroenteritis accounted for the most common diagnosis. In respiratory system, the most common condition seen was acute exacerbation of bronchial asthma; regarding cardiovascular system, acute coronary syndrome was the common condition seen; whereas in central nervous system, cerebrovascular accident was the common condition seen; in genitourinary system, renal colic was the condition commonly seen.

Table 1: Most common presenting complaint, diagnosis and system involved in Patients visiting Emergency medicine department

System involved	No.of Patients n=160	Most common diagnosis	No. of Patients (n=160)	Most common presenting complaint	No. of Patients (n=160)
Trauma	30	Traumatic brain injury	10	Road traffic accident	16
Gastrointestinal	29	Acute Gastroenteritis	12	loose stools with vomiting	12
Miscellaneous	21	Post Viral Myalgia	7	Generalised weakness	16
Respiratory	19	Acute exacerbation of Bronchial Asthma	14	Breathlessness	18
Central nervous system	17	Cerebrovascular accident	6	Altered Sensorium	6
Toxicology	14	Organophosphorus poisoning	12	Insecticide consumption	12

In our study total of 665 drugs were prescribed in 160 with an average of 4.15 per encounter and 71/160 (44.37%) encounters had more than 4 drugs prescribed.

Table 2– Most common drugs used in Emergency Medicine Department.

Sr.no	Drug group	Name of the drug with frequency. (n=160)
1	IV fluids [142 (88.74%)]	NS 52(32.50%), DNS 42(26.25%), RL 23(14.37%), 3% NaCl 12(7.50%), Mannitol 13(8.12%).
2	Antiulcer, Antiemetics [135 (84.3%)]	Pantoprazole 66(41.25%), Ondansetron 60(37.50%), Hyoscine Butylbromide 9(5.62%).
3	Analgesics [107 (89.11%)]	Paracetamol 64(40%), Tramadol 25(15.62%), Diclofenac 18(11.25%).
4	Antimicrobials [43 (26.8%)]	Ceftriaxone 25(15.62%), Gentamycin+ cefuroxime 9(5.62%), Ciprofloxacin+ metronidazole 9(5.62%).
5	Bronchial Asthma [37 (23.12%)]	Ipratropium bromide Neb 19(11.87%), Salbutamol Neb 18(11.25%).
6	OP poisoning [22 (13.75%)]	Atropine 11(6.87%), Pralidoxime 11(6.87%).
7	Snake bite [2 (1.25%)]	ASV 2(1.25%)
8	Others [144 (90%)]	

- Total frequency is more than 100% because multiple drugs were given to each patient.

Table 2 shows that IV fluids [NS (32.50%) and DNS (26.25%)], pantoprazole (41.25%) and paracetamol (40%) were the most common drugs used in ED

Table 3a, 3b, and 3c shows indications for most commonly used drugs in the present study.

Table 3 :Most Common Indications For Some Commonly Used Drug Groups

Table 3a :Most Common Indications For IV Fluids

Sr.No	Drugs	Common Indications	No.of Patients (n=160)	Frequency
1	IV Fluids	Maintenance	70	43.75%
		Dehydration	29	18%
		Hypovolemic Shock	17	10.62%

Table 3b:Most Common Indications For Antiulcer, Antiemetic Drugs

Sr.No	Drugs	Common Indications	No. of Patients (n=160)	Frequency
2	Antiulcer, Antiemetics	Acute Gastroenteritis	12	7.50%
		Acute Gastritis	11	6.87%
		Acute Coronary Syndrome	7	4.37%

Table 3c:Most Common Indications For Analgesics/NSAIDS

Sr.No	Drugs	Common Indications	No. Of Patients (n=160)	Frequency
3	Analgesics /NSAIDS	Abdominal Pain	17	10.62%
		Musculoskeletal	16	10.00%
		Headache	14	8.75%

In our study, 48 (30%) patients were prescribed antibiotic. Most commonly prescribed antibiotic was ceftriaxone (15.62%), followed by cefuroxime along with gentamycin (5.62 %), ciprofloxacin along with metronidazole (5.62%).Most common indication for use of antibiotic is lower respiratory tract infection (11.87%), followed by acute gastroenteritis (5.62%), open fracture (5.62%), for prophylactic purpose (3.12%), and 1.87% in meningitis and Urinary tract infection.

In our ED steroid was prescribed to 22 (13.75%) patients during this study period. Acute exacerbation of bronchial asthma was the commonest indication for use of steroid in ED. Hydrocortisone [21 (13.12%)] was the steroid commonly used in ED.

DISCUSSION:

This is an observational study conducted at Government Medical College, Miraj to analyse drug utilisation design in the ED which is a newly established department.

Survey on the drug utilization in the ED is very important not only for the physician to evaluate whether recommended guidelines have been followed, but also helps to identify and rationalise the medicine usage which would be beneficial in our developing country with a heavy load of patient presenting to the ED. At the same time it gives a bird's eye view of the presenting patient population in the area.[1]

A total of 160 patients enrolled in the study and as observed in fig1 majority were young in the age group of 21-40(45%) and mostly males (59%).This is in accordance with the most common presenting complaint of trauma (18.75%) to ED which could be because of vicinity of highway, poor road conditions and lack of awareness about traffic laws, leading to more accidents.

Other studies have found cardiovascular complaints to be commonest presentation[2] which is not the case with our study possibly because our city is famous as a medical hub with many multispecialty hospitals but since most trauma cases are medico legal cases and ours being a government institute catering to a wide range of urban and rural population. Thus we also saw an increased number (13.12%) of miscellaneous cases. Almost all poisoning cases (14) were due to Organophosphates (OP) (12) poisoning probably because this area is

predominantly an agricultural area and OP are easily available. This might be the reason why other studies didn't record much poisoning cases [1,4].

Most common route of administration in our Emergency Room was intravenous (100%) followed by intramuscular route (17.5%), inhalation route (11.87%), oral route (5.62%), topical (1.25%) and subcutaneous route (0.625%) which was similar to another previous study where intravenous route was commonly used accounting to 41.85% followed by intramuscular accounting to 24.72%, nasal and topical routes accounting to 0.55% and 1.38% respectively [8]. This might be due to the fact that, intravenous route helps in attaining a faster therapeutic effect which is required in case of handling a sick patient especially when it comes to ED. Other benefits of IV route include precise dosing, capability of continuous dosing and enhanced bio-availability

In our study the average number of drugs per prescription was 4.15 which varied from the other similar study as shown below[1, 6, 9].Studies Average number of drugs per prescriptionOur study4.15Barot et al9.99 ± 2.55Mishore et al 2.19Cheekavolu4.2 ± 1.2.

This difference from the others could be due to the study population considered during the study period which was smaller than the other studies. And this polypharmacy also could be probably due to the empirical use of drugs in ED while focussing to treat multiple differential diagnosis while evaluating for the final diagnosis. Also factors like stay time in ED, complexity of the case, limited access to patient information, allergic reaction history also play a pivotal role in determining drugs per encounter [8].

In our study 31.87% drugs were prescribed by generic names which was similar to a previous study accounting to 12%, these numbers are very lower than the standard required (100%). Using generic name is a best practice which reduces the risk of errors which can occur due to drug duplication [1].

In our study the most commonly used drug was pantoprazole which is more commonly used as an anti-ulcer prophylaxis. Patients with acute sick phase of illness, not receiving enteral nutrition, on multiple drugs such as NSAIDs, aspirin and steroids are at high risk of developing gastric stress ulcers, also pantoprazole was prescribed for cases of non-cardiac chest pain like gastritis. A similar study mentioned that the most common indication for prescribing Proton pump inhibitors (PPI) was GI prophylaxis, which was in line with our findings [10]. The next commonly used drug in our department was paracetamol. This could be probably due to the use of it both as analgesic and antipyretic. Another study shows that Diclofenac was the most prescribed analgesic [8].

Essential drugs are illustrated as “those that satisfy the priority health care needs of the population. They are intended to be available within the context of functioning health systems at all times in adequate amount and appropriate dosage forms with assured quality” [3] In our study 78.94% drugs were prescribed from the essential drug list which was lower than the required standards, our results did not match with a similar study, in which 90.2 % drugs were from the essential drug list [6].

The above disparity might be because, in our study the prescribed drugs that were not included in the essential drug list were Tramadol, Pantoprazole, Diclofenac, Adenosine, Pheniramine, Pralidoxime, Octreotide, Anti snake venom, Aluminium hydroxide + Magnesium Hydroxide and 3% NaCl which were all used for the emergency management of the patients. The surge in the use on analgesics like Tramadol can be attributed to the increased flow of trauma cases to our ED. Our college being located in a rural area, has a relatively higher number of Organophosphorous poisoning and snake bite cases, which might have led to increased use of Pralidoxime and anti-snake venin respectively. Also adaptation of newly implemented changes in treatment guidelines, alterations according to patient's medical history could have led to this above specified variation.

Limitations of the study.

- Sample size is small.
- Study was conducted for a short period.
- The study was conducted at a single centre.

CONCLUSION

Our study found that trauma was the most common reason for patients visiting ED, followed by others like acute gastroenteritis, post viral myalgia, acute exacerbation of bronchial asthma.

In total, 665 drugs were prescribed during the study, with IV fluids and Pantoprazole being the most commonly prescribed drug, and IV route being the most common route of administration. The results of this study, shows that our drug usage did not completely align with the recommended values of the WHO prescribing indicators, indicating suboptimal prescription practices. Thus, it is crucial for healthcare providers to collaborate in promoting adherence to the established standards of drug utilisation described by WHO.

Conflicts of Interest- Nil.

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