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Research Article

A study of prescribing pattern of drugs in patients of cardiovascular emergencies at a tertiary care hospital of Western Maharashtra

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ABSTRACT

Background: The main objective of drug utilization research is to assess the rationality of drug use. Recently it has been found that cardiovascular disease is the most frequent cause of morbidity and mortality throughout the world. The objective of present study was to focus on the trends in prescribing patterns of most frequently treated cardiovascular emergencies.
Methods: A retrospective descriptive study was carried out in cardiovascular emergency patients. From the medical records the following data was collected: Distribution of cardiovascular emergencies (age and sex wise), most common cardiovascular emergencies treated, outcome of each patient, average duration of stay in the hospital and drugs prescribed per patient, correlation of clinical outcome with treatment if possible, drug utilization trend in cardiovascular emergencies. From the data, master chart was prepared for data analysis.
Results: Total 82 patients case records were studied. Myocardial infarction (50%) was the most common cardiovascular emergency treated during study period followed by unstable angina (36.58%). Male to female ratio was 1.83. Average hospital stay was found 5.75 days. The average number of drugs per patient was 8.4. Hypertension (42.24%) and diabetes mellitus (19.51%) were the most common comorbidities found associated with cardiovascular emergencies. Aspirin clopidogrel combination (80.49%), enoxaparin (75.61%), atorvastatin (73.17%), glyceryl trinitrate (73.17%) were the most commonly prescribed drugs. The utilization rate of ACE inhibitors and ARBs (56.10%) was found higher than that of beta blockers (28.05%). Stool softeners (52.46%) and anxiolytics (28.58%) were the most commonly used non-cardiovascular drugs. Improvement was seen in 82.93% patients.
Conclusions: Protocol of management strategy of cardiovascular emergencies in our tertiary care hospital was found near to standard recommended guidelines.

Keywords: Cardiovascular emergencies, Drug utilization, Myocardial infarction

INTRODUCTION

Recently it has been shown that cardiovascular disease is the most frequent cause of morbidity and mortality throughout the world. The risk of cardiovascular disease has increased in South Asians also.[1] In addition to the high rate of coronary Heart disease (CHD) mortality in the Indian subcontinent, CHD manifests almost 10 year earlier on an average in this region compared with the rest of the world resulting in a substantial number of CHD deaths occurring in the working age group. As a result, the Indian subcontinent suffers from a tremendous loss of productive working years due to cardiovascular deaths.[2,3]

Prescription writing is a science and an art, as it conveys the message from the prescriber to the patient.[4] Rational drug prescribing is defined as "the use of the least number of drugs to obtain the best possible effect in the shortest period and at a reasonable cost."[5, 6] Occurrence

of irrationality in clinical practice is not a uncommon.[7] Accurate diagnosis, proper prescribing, correct dispensing, suitable packing and patient adherence are important for rational use of drugs [8] The consequences of irrational prescribing include ineffective treatment, unnecessary prescription of drugs, development of resistance and economic burden on patients and the society.[9] The study of prescribing patterns helps to monitor, evaluate and if necessary, suggest modifications in prescribing patterns so as to make medical care rational and cost effective.[10]

To identify problems in prescribing patterns, retrospective drug utilization review can be used through the analysis and interpretation of aggregate archival data on drug prescriptions. This process has no immediate effect on patient care but can identify trends and prompt intervention.[11]

The objective of present study is to focus on the trends in the drug utilization in most frequently treated cardiovascular emergencies.

METHODS

Study design & place of research

It was a retrospective descriptive study carried out in cardiovascular emergency patients who were admitted in the ICU unit of tertiary care hospital of Western Maharashtra.

Ethical approval

The study was conducted after obtaining the permission of Institutional Ethics Committee and permission also taken from the H.O.D. of Medicine Department.

Inclusion criteria

Case records of cardiovascular patients admitted to the ICU during the period from 1st July 2011 to 31st December 2011 were studied.

Exclusion criteria

Incomplete data entry case records were excluded from the study

Methodology

During the study period total 82 case records of the cardiovascular patients were studied. Diagnosis along with the drugs prescribed was recorded for each patient of cardiovascular emergencies. From the medical records the following data was collected:

Data collection includes

- Distribution of cardiovascular emergencies (age and sex wise).
- The most common cardiovascular emergencies treated.
- The outcome of each patient of cardiovascular emergencies.
- Average duration of stay in the hospital.
- The correlation of clinical outcome with treatment if possible.
- Average number of drugs prescribed per patient.
- Drug utilization trend in our hospital for cardiovascular emergencies.

The data collected was condensed and master chart was prepared for data analysis.

Statistical analysis

The overall information generated was entered in Microsoft excel sheet (2010 version) and results were expressed in the form of percentage.

RESULTS

Table 1: Shows the common cardiovascular emergencies treated.

Cardiovascular emergencies	Number of patients	Percentage
Myocardial infarction	41	50
Unstable angina	30	36.58
Congestive heart failure	8	9.76
Arrhythmias	3	3.66
Total	82	100

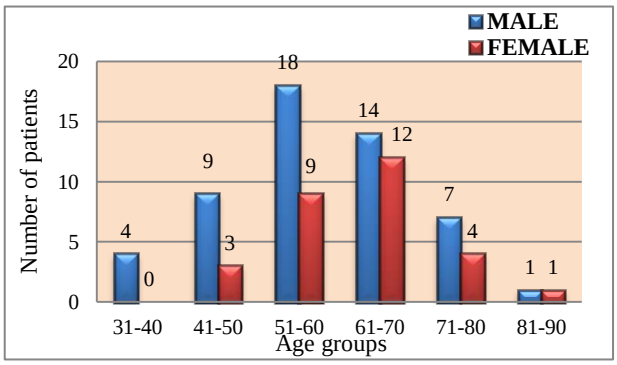


Figure1: Age-wise distribution of male and female patients.

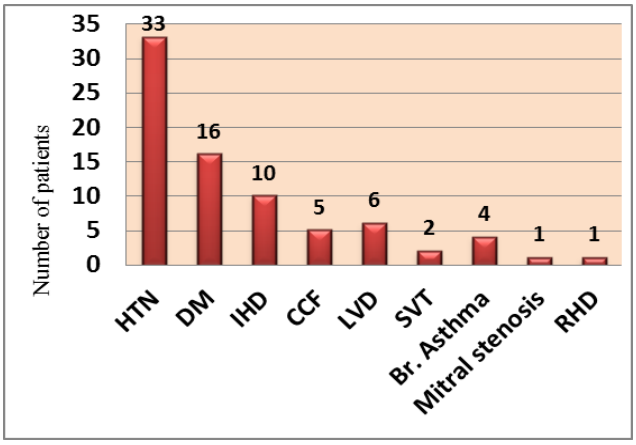
Analysis of 82 patients was done. Most common cardiovascular emergency was myocardial infarction (50%) followed by unstable angina (36.58%) (Table 1). Among 82 patients, incidence of male patients (64.63%)

was found more than female (35.37%). Male to female ratio was found 1.83. (Table 2) In each age group incidence of cardiovascular emergencies was found more in male patients as compare to female patients. Incidence of cardiovascular emergencies in female patient in age group 31-50yrs was found significantly lower than age group 51-70 yrs (Figure 1).

Table 2: Number of male female patients.

Cardiovascular emergencies	Male	Female
Myocardial Infarction	24 (29.27%)	17 (20.73%)
Unstable angina	21(25.60%)	9 (10.98%)
CCF	6 (7.32%)	2 (2.44%)
Arrhythmias	2 (2.44%)	1 (1.22%)
Total	53 (64.63%)	29 (35.37%)

Hypertension (42.24%) and diabetes mellitus (19.51%) were the most commonly associated comorbidities in cardiovascular patients (Figure 2). Average total hospital stay was 5.85 days. In that average ICU stay was 1.85 days and average medicine ward stay was 3.9 days. Average number of drugs prescribed per patient was 8.4. Aspirin clopidogrel combination (80.49%), enoxaparin (75.61%), atorvastatin (73.17%) and glyceryl trinitrate (73.17%) were the most commonly prescribed drugs. Loading dose of aspirin (325 mg) and clopidogrel (300 mg) was given in 65.85% patient (Table 3).



HTN: Hypertension; DM: Diabetes Mellitus; IHD: Ischemic Heart Disease; CCF: Congestive Heart Failure; LVD: Left Ventricular Dysfunction; SVT: Supraventricular Tachycardia; Br. Asthma: Bronchial Asthma; RHD: Rheumatic Heart Disease.

Figure 2: Association of other comorbidities with cardiovascular emergencies.

Use of ACE inhibitors and ARBs (56.10%) was found more as compare to beta blockers (28.05%) and calcium channel blocker (2.44%). Ramipril was the most commonly used ACE inhibitor while Olmesartan was the most commonly used ARBs. In beta blockers, use of metoprolol was found to be more. Amlodipine was the most commonly used calcium channel blocker. Use of nicorandil (potassium channel opener) was found in 32.93% patient. Use of insulin was found in 12.19% patient while that of oral hypoglycaemic agents was 7.31% (Table 3).

Table 3: Percentage of the patients received particular drugs.

No.	Name of the drug	Percentage of the patients
1	Aspirin (loading dose)	65.85
2	Clopidogrel (loading dose)	65.85
3	Clopidogrel + Aspirin	80.49
4	Streptokinase (IV)	31.71
5	Enoxaparin (S.C.)	75.61
6	Atorvastatin	73.17
7	GTN (IV)	73.17
8	Nicorandil	32.93
9	Ramipril	42.68
10	Olmesartan	6.1
11	Amlodipine	2.44
12	Metoprolol	26.83
13	Furosemide (IV)	25.61
14	Torasemide (IV)	8.54
15	Dopamine	12.2
16	Digoxin (IV)	10.98
17	Buprenorphine (IV)	9.76
18	Lorazepam	10.98
19	Alprazolam	18.29
20	Liquid paraffin	23.17
21	Isapghula	29.27
22	Insulin	12.19
23	Oral hypoglycemic drugs	7.31

Table 4: Condition of the patient at the time of discharge.

Cardiovascular emergencies	Improv-ment	Unchanged	Expired
MI	34	4	3
Unstable angina	27	2	1
CCF	4	2	2
Arrhythmias	3	0	0
Total	68	8	6
Percentage	82.93%	9.76%	7.32%

Out of 41 patients of MI, 38 patients had ST elevated MI. Streptokinase was the most commonly used fibrinolytic agent. It was used in 68.42% patients of ST elevated MI. For relieving pain in MI, use of glyceryl trinitrate (63.42%) was found more as compare to buprenorphine (9.76%). IV furosemide (25.61%) was the most commonly used diuretics followed by IV torasemide (8.54%). Dopamine (12.2%) was the most commonly used inotropic agent. Use of digoxin (10.98%) was found mainly in arrhythmia cases. Stool softeners (52.46%) and

anxiolytics (28.58%) were the most commonly used non-cardiovascular drugs.

Improvement was seen in 82.93% patient, while condition was not improved in 9.76% patient at the time of discharge (Table 4).

DISCUSSION

During past few years numerous research studies have been conducted worldwide to determine the safe and effective drug utilization indicating that inappropriate drug use is a universal phenomenon.[12]

To examine the use of drugs in a society, trend of drug utilization studies has been raised globally in different health setups. Such types of drug utilization studies are helpful to determine the pattern of prescription and for setting the priorities to avoid the irrational drug use.[13]

The present study was conducted to find out prescribing pattern of drugs used in cardiovascular emergencies in tertiary care hospital of Western Maharashtra. Total 82 patients case paper were analysed during six month study period. Results pointed out that the frequency of cardiovascular emergencies was more in male patients (64.63%) than female patients (35.37%), which is in accordance with the study conducted by Weidner G, Jousilahti P and Chrysohoou C.[14-16]

In the age group 31-50 years, the number of female patients was found significantly less as compare to the number of female patients in the age group 51-70 yrs. The reason for increased incidence of cardiovascular emergencies in female could be the loss of cardio protective effect of estrogen after menopause. Also there was no significant difference between number of male (17.07%) and female (14.63%) patients in the age group 61-70 yrs.[17] As far as age factor is concerned 32.93% patients belong to age group 51-60 yrs and 31.70% patients belong to 61-70 yrs. Hence 63.64% patients belong to age group 51-70 yrs. This shows that CHD manifests 10 years earlier on an average in Indian subcontinent compared with the rest of the world.[18]

Study conducted by Karthikeyan G, average stay in cardiovascular disease patient was found to be 7 days.[19] In our study, average hospital stay was found 5.75 days. Average ICU stay was 1.85 days and that of medicine ward was 3.9 days.

Results showed that myocardial Infarction (50%) was the most commonly cardiovascular emergency followed by unstable angina (36.58%), which is in accordance with the study conducted by M. Martinez and Ian A. Scott.[20,21] Hypertension (42.24%) and diabetes (19.51%) were the most commonly obsereved comorbidities associated with cardiovascular emergencies. These figures of our study are very similar to the study conducted by Ian A. Scott et al. And Prabhakaran D et al[21, 22] Average number of drugs prescribed per patient was found to be 8.4. Study conducted by Nagabushan H. found average number of drugs prescribed per patient is 7.8±2.[23]

In our study we noticed that utilization rate of antiplatelet (Aspirin and Clopidogrel), Anticoagulant (LMWH), Statins (atorvastatin), Nitrates (Glyceryl trinitrate) high. This finding correlates with the standard guidelines mentioned for use of drug in cardiovascular emergencies. These results were found to be similar to various studies conducted by Ian A. Scott et al, Venu menon et al, F venturini et al.[21,24,25]

Further in our study, utilization rate of ACE inhibitors and ARBs was found to be much more than that of beta blockers and calcium channel blockers. This finding coincides with the study conducted by M. Martinez et al, Kizer JR et al and Escosteguy CC et al.[26-28] According to Friedman B.M. Recent data from the mega trial support the early use of ACE inhibitors after acute MI. In this mega trial the use of ACE inhibitors was associated with substantial reduction in mortality in MI patients.[29]

According to Borzak K and Jugdutt, IV nitroglycerine is effective in the management of myocardial infarction by relieving pain and infarct size. In our study, we found that IV nitroglycerin was commonly used in myocardial infarction patients (63.48%).[30]

Stool softeners and anxiolytics were the most commonly prescribed non-cardiovascular drugs in cardiovascular emergencies and which is according to standard guidelines. Improvement was seen in 82.93% patients.

Limitation of the study

Small sample size and short study duration are the two main limitations of our study. The study would have been better if other tertiary care hospitals of the city also included. The results of our study cannot be extrapolated to general population because study was conducted in only one tertiary care hospital.

CONCLUSIONS

Protocol of management strategy of cardiovascular emergencies in our tertiary care hospital was found near to standard recommended guidelines and the clinical outcome of the patients is favourable since improvement was seen in 82.93% patients.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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