Study of prescription pattern in medicine intensive care unit of a rural medical college and hospital of Himachal Pradesh: A retrospective observational study

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Abstract

Introduction: A large number of drugs are prescribed to the patients in Intensive Care Unit (ICU), as the condition of most patients is critical.

Materials and Method: we conducted a retrospective observational study and all the patients admitted to ICU between March 2016 to July 2016 were included in the study except for those who expired.

Results: Total 152 cases were included with 100 (65%) males and 52 (35%) females. The mean age was 60.05 ± 16.05 years with a range of 20 years – 90 years with mean age of 58.72 ± 14.85 years in males and 62.52 ± 17.80 years in females. 111 (73%) patients were more than 50 years of age. Average duration of hospital stay was 2.96 ± 2.57 days with a range of 1 to 20 days. Hypertension and Diabetes were most common co-morbidities (52%). Average numbers of drugs prescribed were 11.06 ± 3.88. CVS system was affected in 80%, respiratory system in 6%, excretory system in 4%, GIT in 3%, CNS in 2% and others in 5% patients. Drugs prescribed were atorvastatin in 124, aspirin ± clopidogrel in 119, anticoagulants in 105, oxygen inhalation in 95, benzodiazepines in 94, ACEIs/ ARBs in 93, β- Blockers in 86, laxatives in 81, morphine in 62, antiemetics in 58, gastric acid secretion inhibitors in 58, diuretics in 50, vasopressor agents in 48, nitrates in 45, bronchodilators in 44, fibrinolytics in 32, steroids in 29, antidiabetics in 28, antihistaminics in 21, NSAIDs in 20, atropine in 15, antianginals in 7, CCBs in 6 and potassium channel openers in 2 patients.

Conclusion: Frequent drug utilization studies are need of the hour to know drug prescription pattern and to promote evidence based medicine.

Keywords: Prescription pattern, ICU.

Introduction

Severely ill patient with co-morbidities gets admitted to ICU and different classes of drugs are prescribed according to the need. Study related to drug utilization has to be evaluated as and when so that the therapeutic efficacy can be increased and adverse affects can be reduced.(1) Major health problem in health care delivery all over the world is in appropriate prescription.(2) WHO defines drug utilization study as a "structured process which is used to assess the quality of drug therapy by engaging in evaluation of data on drug prescribing, dispensing and patients use in a given health care environment, against predetermined and agreed upon criteria and standard, with special emphasis on the resulting medical, social and economic consequences".(3) Efficacy and safety of a drug can be investigated by Drug utilization study.(4) The average number of drugs prescribes should be low as much as possible in order to prevent or minimize possible drug interactions, bacterial drug resistance and also hospital cost.(5)

Objective

Main objective of this study was to study the prescription pattern in the medicine ICU of tertiary care hospital.

Materials and Method

This was a retrospective observational study. All the patients admitted to ICU between March, 2016 to July, 2016 were included in the study except for those who expired.

Study period: 5 months (March 2016 to July 2016).

Results

Total 152 patients were enrolled in the study. Demographic data (Fig. 1) shows males were 100 (65%) and females were 52 (35%).

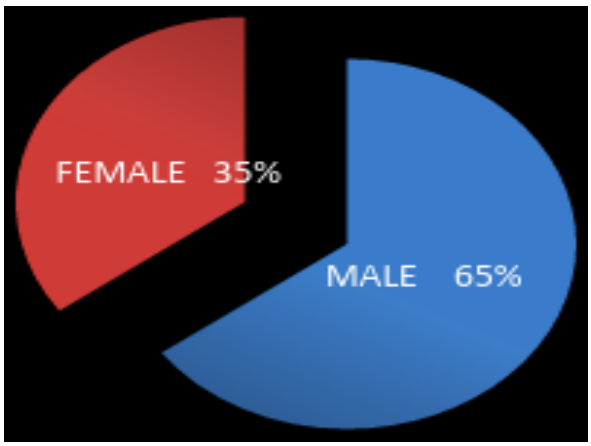

Fig. 1: Distribution of male and female patients

The mean age was 60.05 ± 16.05 years with a range of 20 years– 90 years. The mean age of males was 58.72 ± 14.85 years and females was 62.52 ± 17.80 years. Maximum 42 (27.63%) patients were of the age group 61–70 years.

111 (73%) patients were more than 50 years. (Fig. 2).

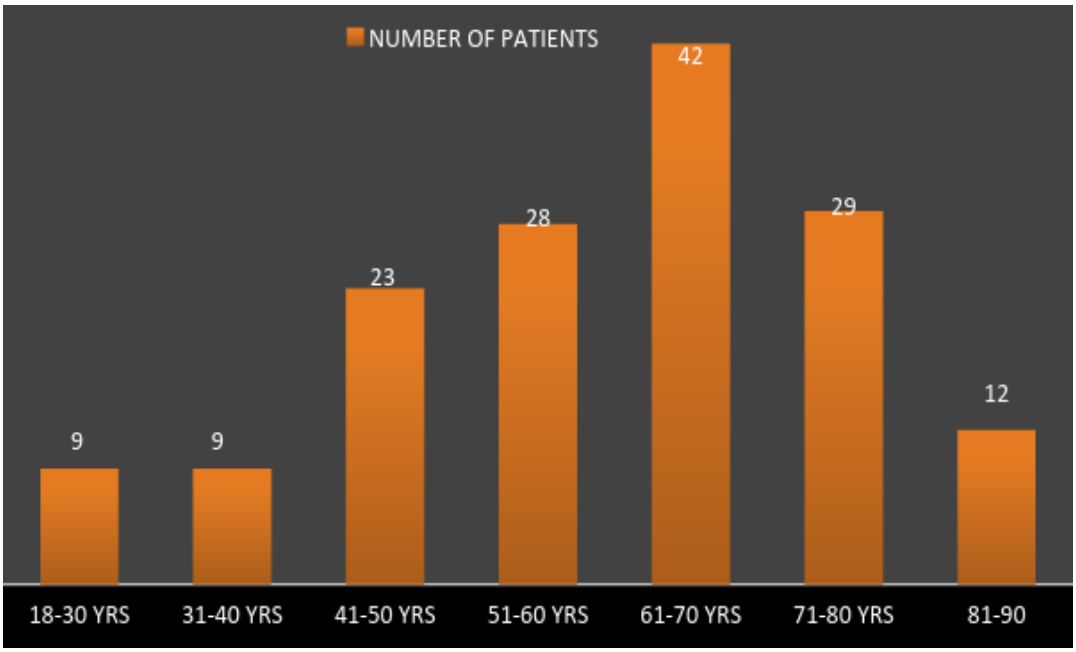

Fig. 2: Age distribution of patients

District Wise Distribution: Shows that 82% of patients were from local district Kangra, 8% were from Mandi, 5% were from Hamirpur, 3% were from Chamba and 1% each from Una and Delhi. (Fig. 3).

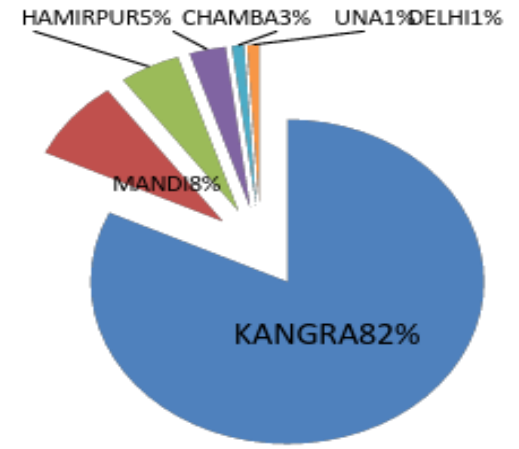

Fig. 3: District wise distribution of patients

System Wise Disease Distribution: 121 (80%) patients were of CVS system involvement followed by respiratory system in 10 (6%), GIT in 4 (3%), CNS involvement in 3 (2%) and others in 8 (5%) (Fig. 4).

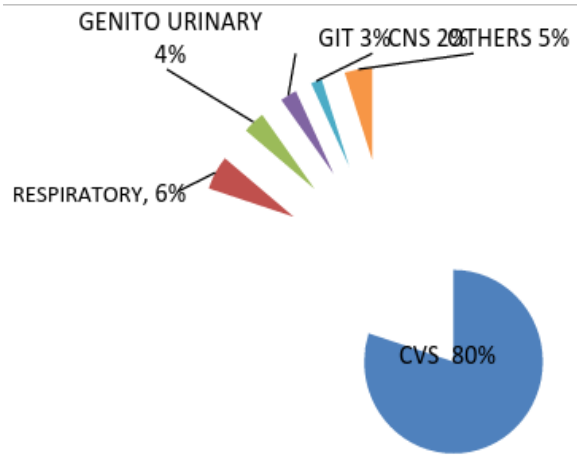

Fig. 4: System wise distributions of patients

Disease Pattern: Hypertension and diabetes were most common co-morbidities in 79 cases (52%). Hypertension was observed in 38 patients, Diabetes was observed in 19 and both diabetes and hypertension observed in 22 patients.

Average number of drugs prescribed were 11.06 ± 3.88 and 69 patients (45.39%) were prescribed 9 to 12 drugs. (Fig. 5).

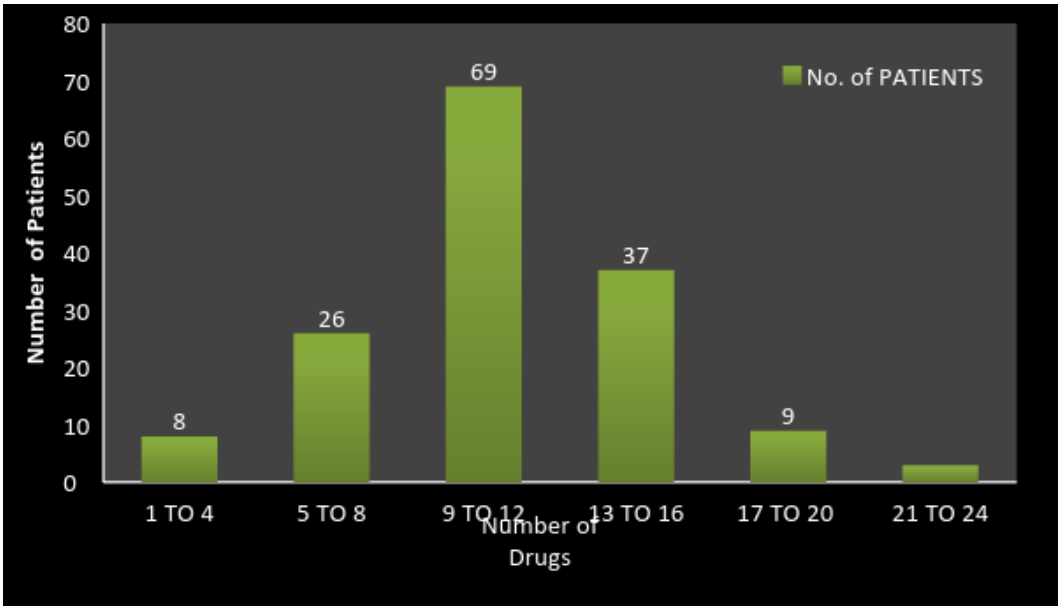

Fig. 5: Number of drugs prescribed

Prescription Pattern: Atorvastatin in 124, aspirin along with Clopidogrel in 110 and aspirin alone in 9, LMW heparin and oral anticoagulants in 105, oxygen inhalation in 95, benzodiazepines in 94, ACEIs/ ARBs in 93, β-blockers in 86, laxatives in 81, morphine in 62, ondansetron and metoclopramide in 58, PPIs and H_2 blockers in 58, diuretics like furosemide, torasemide and spironolactone in 50, vasopressors in form of dopamine, noradrenaline and dobutamine in 48, nitrates in 45, bronchodilators in 44, thrombolytic streptokinase, reteplase and alteplase in 32, steroids in 29, insulin and oral hypoglycemic agents in 28, pheniramine, cetirizine and desloratidine in 21, NSAIDs in 20, atropine in 15, antianginal drugs trimetazidine and ranolazine in 7, CCBs amlodipine and diltiazem in 6 and potassium channel Openers nicorandil in 2 patients (Fig. 6).

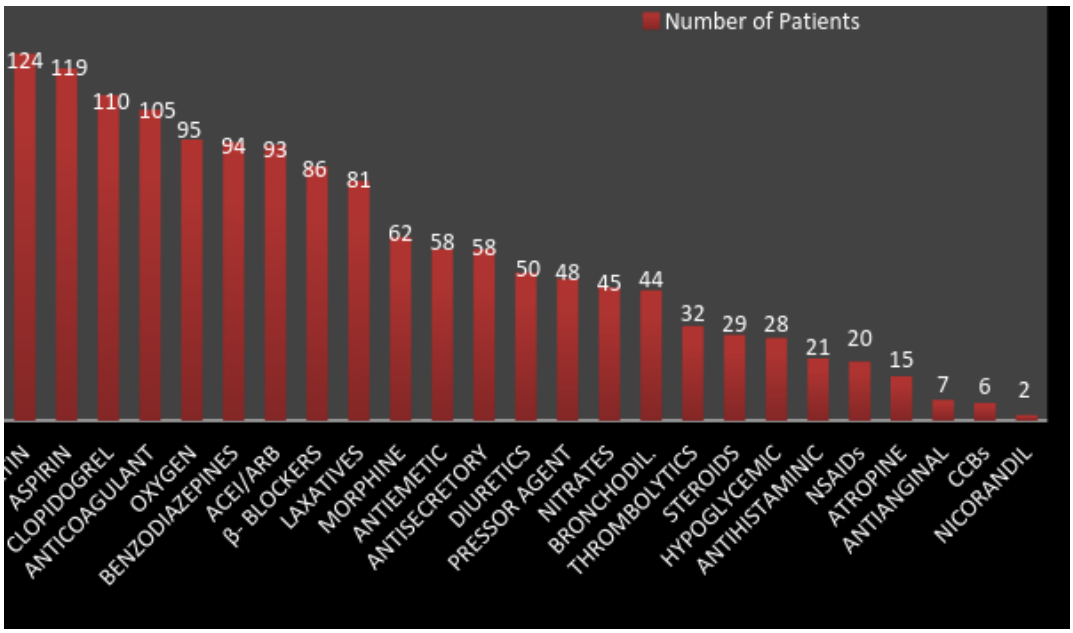

Fig. 6: Drugs prescription pattern in ICU patients

Average duration of hospital stay was 2.96 ± 2.57 days with a range of 1 to 20 days.

Outcome: Total 87 patients (57%) were referred to higher centre, 55 patients (36%) were discharged and 10 patients (7%) left against medical advice (LAMA) (Fig. 7).

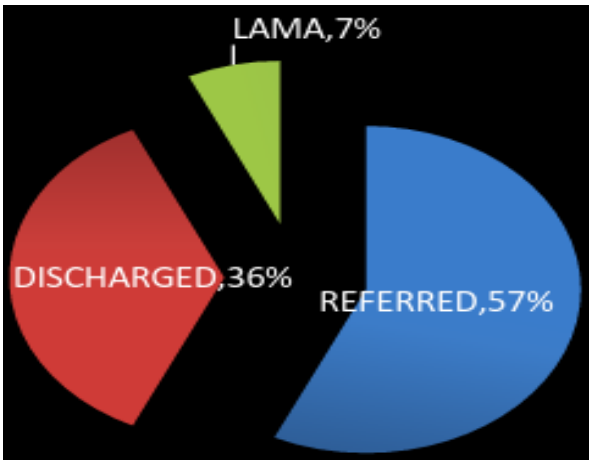

Fig. 7: Outcome of patients

Tables 1-11 show different classes of drugs along with the agents and percentage to particular class.

Table 1: Antianxiety Drugs (N= 94)

Class	Drugs (N)	Percentage (%)
Benzodiazepines (BZD)	Alprazolam (88)	93.61%
	Midazolam (04)	4.25%
	Lorazepam (02)	2.12%

Table 2: ACEIs/ ARBs (N= 93)

Class	Drugs (N)	Percentage (%)
ACEIs	Ramipril (88)	94.62%
	Enalapril (02)	2.15%
ARBs	Telmisartan (02)	2.15%
	Olmisartan (01)	1.07%

Table 3: β – Blockers (N= 86)

Class	Drugs (N)	Percentage (%)
BETA – Blockers	Metoprolol (73)	84.88%
	Carvedilol (09)	10.46%
	Nebivolol (02)	2.32%
	Labetalol (02)	2.32%

Table 4: Antiemetics (N=58)

Class	Drugs (N)	Percentage (%)
5- HT_3 Antagonists	Ondansetron (53)	91.37%
Prokinetic Drugs	Metoclopramide (05)	8.62%

Table 5: PPIs and H_2 Blockers (N=58)

Class	Drugs (N)	Percentage (%)
PPIs	Pantoprazole (37)	63.79%
	Rabeprazole (09)	15.51%
H_2 Blockers	Ranitidine (12)	20.68%

Table 6: Diuretics (N=50)

Class	Drugs (N)	Percentage (%)
High Efficacy	Furosemide (44)	88%
	Torsemide (03)	6%
Aldosterone Antagonist	Spironolactone (03)	6%

Table 7: Vasopressor Agents (N= 48)

Class	Drugs (N)	Percentage (%)
Inotropic Drug	Dopamine (28)	58.33%
Sympathomimetics	Noradrenaline (NA) (17)	35.41%
Cardiac Stimulant	Dobutamine (3)	6.25%

Table 8: Fibrinolytic (N=32)

Class	Drugs (N)	Percentage (%)
Fibrinolytic	Streptokinase (22)	68.75%
	Reteplase (07)	21.87%
	Tenecteplase(02)	6.25%
	Alteplase (01)	3.12%

Table 9: Corticosteroids (N=29)

Class	Drugs (N)	Percentage (%)
Short Acting	Hydrocortisone (28)	96.55%
Intermediate Acting	Prednisone (01)	3.44%

Table 10: Antidiabetics (N=28)

Class	Drugs (N)	Percentage (%)
Insulin	Human Insulin (21)	75%
Biguanide	Metformin (5)	17.85%
Biguanide + Sulfonylureas	Metformin + Glipizide (2)	7.14%

Table 11: Antianginals (N=7)

Class	Drugs (N)	Percentage (%)
Antianginal Drugs	Trimetazidine (6)	85.71%
	Ranolazine (1)	14.28%

Discussion

Demographic data of other study shows males predominance which was similar to the study.[6]

The mean age was 60.05 ± 16.05 years with a range of 20-90 years. The mean age in males was 58.72 ± 14.85 years and in females 62.52 ± 17.80 years.

Hypertension and diabetes were most common co-morbidities (79 cases) in these patients, which was approximately 52%. Co-morbidities always increases burden of healthcare and so clinical outcomes gets affected.[7]

Average numbers of drugs prescribed in our study were 11.06 ± 3.88. Our study results are at par with another Indian study which was done in critical care setting in a tertiary care teaching hospitals[8] in which 13.54 drugs were prescribed. Our results are also comparable to another study of medication utilization in medical ICU by Smythe MA et al[9] in which 12.1 drugs were prescribed. When compared to our study, drugs were prescribed in lesser number in previous studies conducted in Nepal[10] (5.1 ± 2.7), Scotland[11] (4.51), South Africa[12] (4.32) and in Swedish hospital (5.1).[13]

Conclusion

Different groups of drugs are prescribed to the patients in ICU and number of total drugs prescribed depends on the critical condition of the patients admitted. Average number of drugs should be kept as low as possible to minimize the risk of drug interactions and development of bacterial resistance. Drug utilization studies are need of the hour to know drug prescription pattern and to study the evidence based drug utilization in the ICU. CMEs must be arranged with health professionals to improve drug utilization patterns in ICUs.

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Conflict of interest: None declared.

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

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