Original Research Article

A Survey on Prescription Pattern of Cardiovascular Drugs among Male and Female Patients According to Therapeutic Class

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ABSTRACT

Cardiovascular drugs comprise a lion portion of the prescription medications which are used to treat and control cardiac disorder(s). It is a complex group of drug(s) with many being used for multiple heart conditions. Our study was a descriptive cross-sectional survey involving collection of patient's prescription from both sexes. Among all patients male dominates in number of almost 70% and rest of the 30% was female. The age class of 40-60 years predominates over other class. The mostly prescribed therapeutic class in terms of percentages anticoagulants, antiplatelets and fibrinolytics (23.23%), lipid lowering drugs (17.47%), beta blockers (12.08%) and anti-anginal and anti-ischemic drugs (12.08%).

Key words: Cardiovascular drugs, lion portion, complex group, cross-sectional survey and therapeutic class.

INTRODUCTION

Cardiovascular diseases (CVDs) are a group of disorders of the heart and blood vessels and they include: coronary heart disease, cerebrovascular disease, peripheral arterial disease, rheumatic heart disease, congenital heart disease, deep vein thrombosis and pulmonary embolism etc. [1] Antithrombotic agents, beta blockers, ACE inhibitors as well as, lipid lowering drugs are associated with a clinically significant reduction is subsequent acute coronary syndromes, need for re-vascularisation and mortality. [2] Cardiovascular diseases (CVDs) are a major health problem throughout the world and a common cause of premature morbidity and mortality, According to World Health Organization (WHO). By 2030 almost 25 million people will die from CVDs, mainly from heart disease and stroke. These are projected to remain the single leading cause of death. [3]

A study in Bangladesh revealed that 27.93%, 21.08% and 13.41% stroke patients with lipid disorder had high cholesterol, low density lipoprotein (LDL) and triglycerides (TG) level respectively. 42.67% patients had low high density lipoprotein (HDL) level showed in the same study. [4]

The prime objective of this survey was to know the prescription pattern for the cardiovascular disease patient, which common drugs the physician considers for the routine CVDs treatment and to find out which ranges of age and which gender are more susceptible to cardiac diseases.

METHODOLOGY

To perform this research the methodology involved for the under taking of a number of steps. Around 130

randomized prescriptions were collected from patient by capturing image of prescription. Two sources were basically used to collect the data, one government institute and one cardiac specialized hospital, Dhaka, Bangladesh. After that, generic name has found by searching brand name of that drug from MIMS. [5] Here all data were collected by capturing image of prescriptions from direct interview of patient. In addition, formal ethical approval for this study was not required as it did not involve an altering the medication or cardiac management.

RESULTS AND DISCUSSION

From the prescription we found that cardiac patients can be divided in 4 groups according to their age. Almost 16.66% patient was between ages 30-40 years, 32.87% patients hold the range from 41-50 years, 34.72% patients were in a range of 51-60 years and 30.55% patient's fall between the range 61-75 years (figure 1). Among all prescription almost 70% patient was male and only 30% were female (figure 2). It seems that in Bangladesh male patients dominate in cardiovascular diseases and a big reason may be that of smoking. Though in many other country female smoking is almost equal to male smoking but in here seems a big difference.
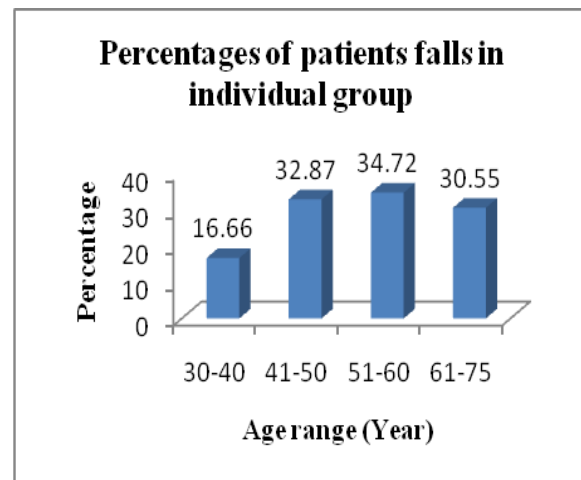

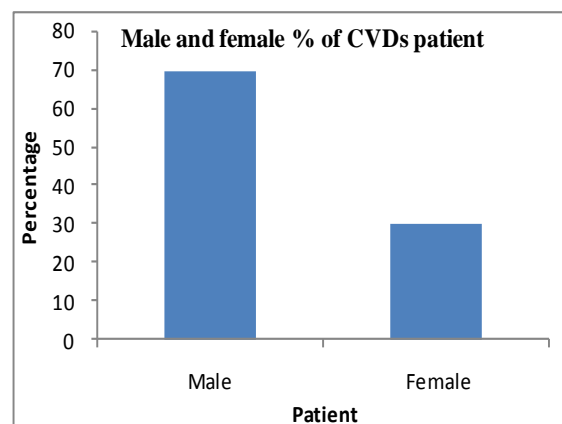**Figure 1: Comparison of age group by percentage**

Figure 2: Percentage of male and female CVDs patient

Table 1: Comparison of generic drug and therapeutic class

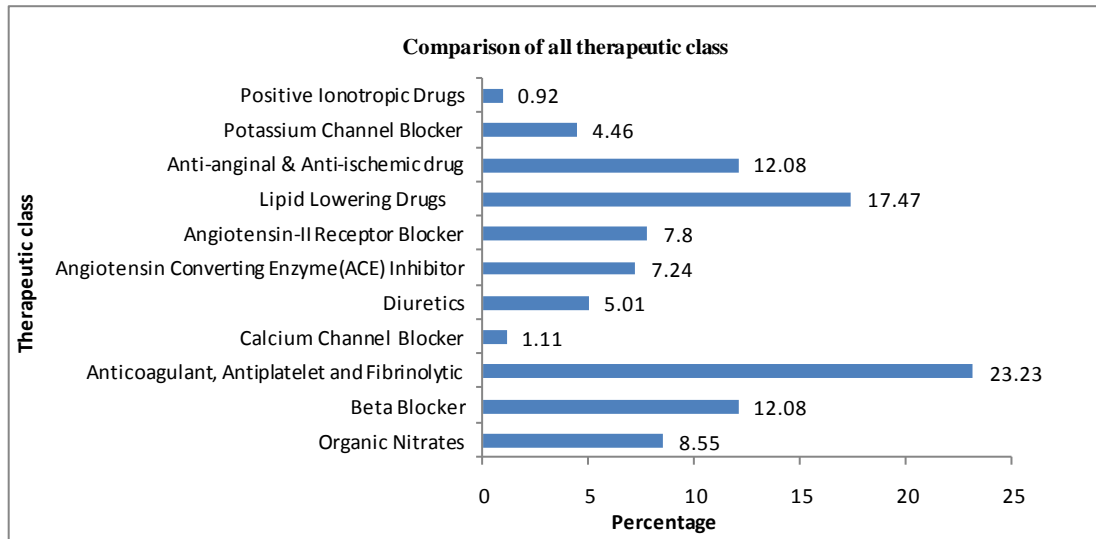| Therapeutic class	Generic name	Generic drug		Therapeutic class	
		No. of prescription	Percentage (%)	Total No. of prescription	Percentage (%)
Organic nitrates	Nitroglycerine or Glyceryl Trinitrate	45	97.82	46	8.55
	Isosorbide mononitrate	1	2.17		
Beta blocker	Atenolol	2	3.07	65	12.08
	Bisoprolol	26	40.00		
	Carvedilol	18	27.69		
	Metoprolol	16	24.61		
	Propranolol	3	4.61		
Anticoagulant, Antiplatelet and Fibrinolytic	Aspirin	53	42.30	125	23.23
	Clopidogrel	71	56.90		
	Enoxaparin sodium	1	0.80		
Calcium channel blocker	Amlodipine	2	33.33	6	1.11
	Diltiazem	3	50		
	Verapamil	1	16.65		
Diuretics	Thiazide	4	14.81	27	5.01
	Loop Diuretics + K^+ sparing diuretics	22	81.48		
	K^+ sparing diuretics(alone)	1	3.70		
Angiotensin converting enzyme (ACE) inhibitor	Ramipril	31	79.48	39	7.24
	Enalapril	2	5.12		
	Perindopril	6	15.38		
Angiotensin - II receptor blocker	Losartan-K	21	50	42	7.80
	Valsartan	3	7.14		
	Olmesartan	18	42.85		
Lipid lowering drugs	Atorvastatin	90	95.74	94	17.47
	Fenofibrate	2	2.12		
	Rosuvastatin	1	1.06		
	Fluvastatin	1	1.06		

Figure 3: Comparison of all therapeutic class

Analyzing the prescription findings that were obtained presented in both tabular and graphical form (table 1, figure 3).

Among all therapeutic class organic nitrates were prescribed on 8.55 % of the total prescription (table 1, figure 3) and among generics of this group Nitroglycerine is the leader (97.82%, table 1, figure 4).
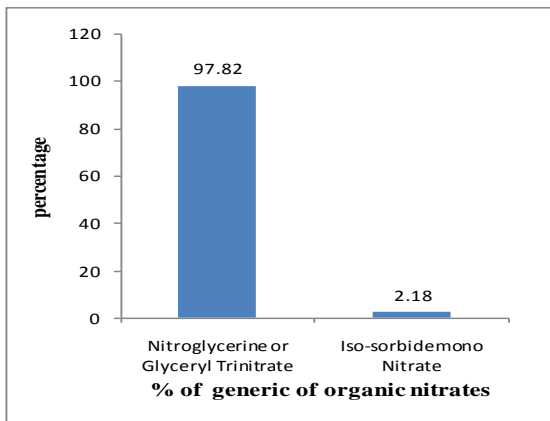
Beta blocker comprises 12.08% of all therapeutic class (Table 1, Figure 3) and bisoprolol is leader of generics (40%, table 1, figure 5).

Among anti-coagulants and anti-platelets both aspirin and clopidogrel dominates and their share is 42.30% and 56.90% respectively (table 1, figure 6).
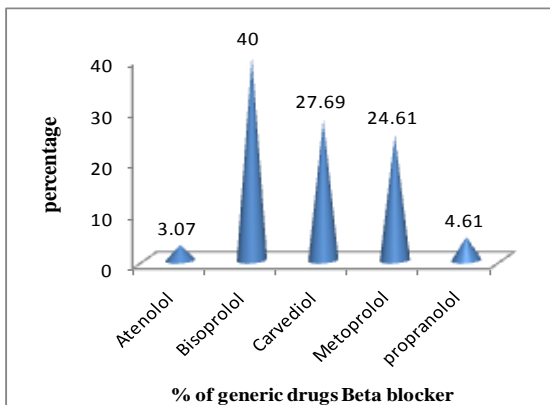

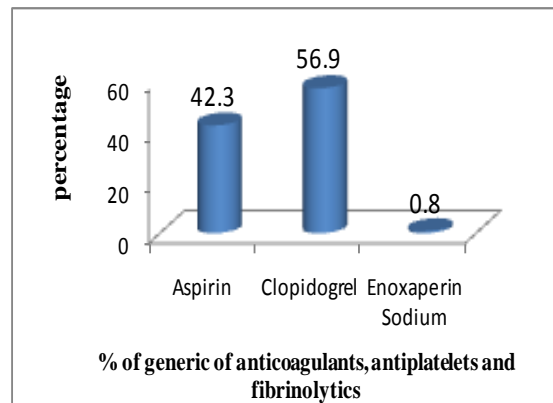Figure 4: Comparison of generics of organic nitrates

Figure 6: Comparison of generics of anti-coagulants, anti-platelet and fibrinolytic.

Very few calcium channel blocker (1.11%, table 1, figure 3) were prescribed and diltiazem is the leader (50%, table 1, figure 7).

Diuretics cover 5% of the total prescription drugs (table 1, figure 3) and here loop diuretics + K^+ sparing diuretics (81.48%, table 1, figure 8) combined preparation is much more preferred than individual by the doctors.
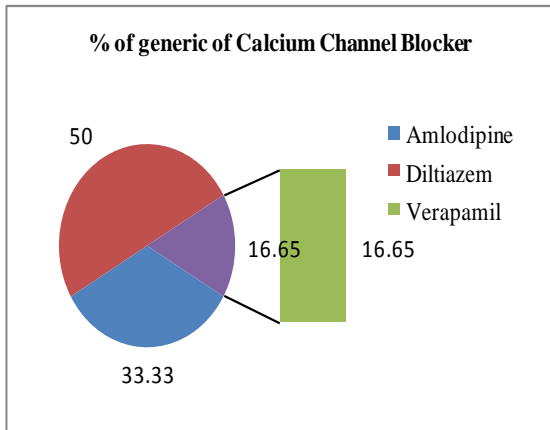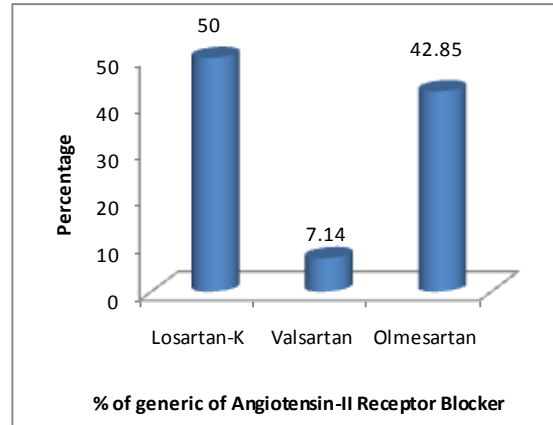

Figure 5: Comparison of generics of beta blocker

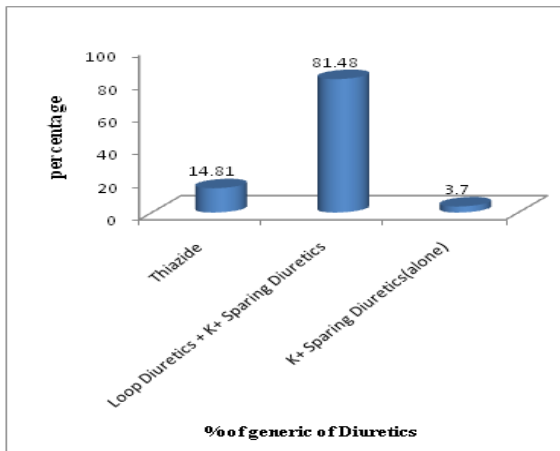**Figure 7: Comparison of generics of calcium channel blocker**

Figure 8: Comparison of generics of Diuretics

ACE inhibitors were prescribed about 7.24% (table 1, figure 3) of all prescriptions and ramipril is the generic leader (79.48%, table 1, figure 9).
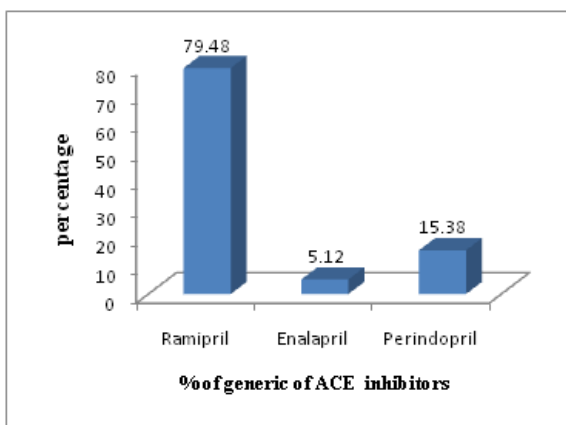

Figure 9: Comparison of generics of ACE inhibitors

Figure 10: Comparison of generics of Angiotensin-II Receptor blocker

Angiotensin II receptor blockers cover 7.80% of all prescription drugs and almost two generics dominate here (Losartan 50% and Olmesartan 42.85%, table 1 and figure 10).

Lipid lowering drugs cover 17.47% of all prescription drugs and atorvastatin is the leader for all generics (95.74%, table 1 and figure 11).
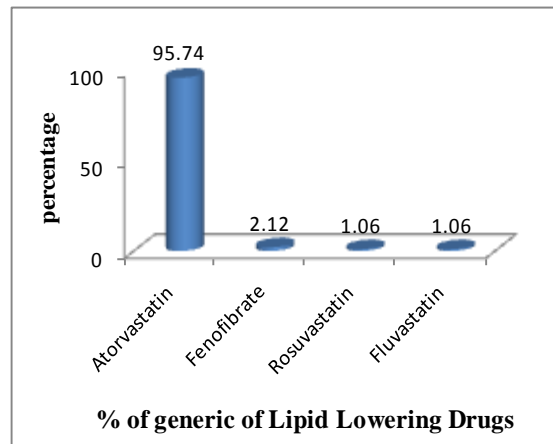

Figure 11: Comparison of generics of Lipid lowering drugs

Among other cardiovascular drugs anti-anginal and anti-ischemic drug, Trimetazidine were prescribed much more (52.30%, table 2, figure 12) than others and potassium channel blocker, Amiodarone (36.92%, table 2, figure 12).

Table 2: Other cardiovascular drugs (with or without combination)

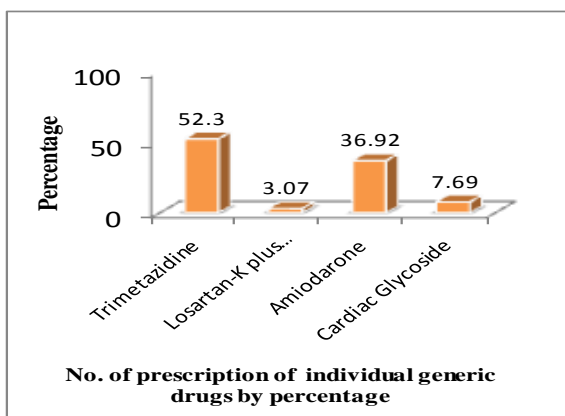| Therapeutic class	Generic name	No. of prescription	Percentage (%)
Anti-anginal & Anti-ischemic drug	Trimetazidine	34	52.30
ACE inhibitor plus diuretics	Losartan-K plus hydrochlorothiazide	2	3.07
Potassium channel blocker	Amiodarone	24	36.92
Positive ionotropic drugs	Cardiac Glycoside	5	7.69

Figure 12: Comparison of other cardiovascular drugs (with or without combination)

Other than cardiovascular drug cardiovascular patients were also prescribed other medication which includes antibacterial, PPI, biguanides, anti-psychotic etc (table 3).

Table 3: Others mostly prescribed drugs with cardiovascular drugs

Therapeutica Class	Generic name
Antibiotic	Flucloxacillin
	Amoxicillin
Oral hypoglycemic	Sulfonylurea
Anti-psychotic (SSRI)	Flupentixol
	Clomipramine (TCA)
Biguanides (Anti-asthmatic)	Salmeterol
NSAIDs	Paracetamol
PPI	Omeprazole
	Esomeprazole
	Pantoprazole
Calcium	Calcium carbonate
Sedative	Diazepam
	Bromazepam
	Clonazepam
Vitamin	Vit B

CONCLUSION

The survey was successful in depicting a part of the whole sector of cardiac patients in Bangladesh and it also gives a clear image of the prescriber's preference for generics of cardiovascular drugs. The overall study was aimed to find out the prescribing habits of physician and their preference for different generic. So, this study also reveals the generic of cardiovascular drug share of pharma market in Bangladesh.

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