

**Trends in drug usage among elderly with cardiovascular diseases****Rajeshwari Shastry\*, Yugandhar Bethi, Sowjanya, Jammula Uday Kumar**

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**Received:** 04 July 2014**Accepted:** 12 July 2014**\*Correspondence to:**

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**ABSTRACT**

**Background:** Cardiovascular disease (CVD) is a common health problem in the world and a major cause of premature morbidity and mortality in the elderly. Various combinations of drugs are used for the management of CVD. Hence, the present study was conducted to analyze the drug usage trends in elderly with CVDs.

**Methods:** A retrospective cross-sectional descriptive study was conducted for a period of 6 months in an outpatient department at a tertiary care teaching hospital. The medical records of elderly (age  $\geq 60$  years) patients with CVDs were reviewed. Drug prescribed mainly for hypertension, ischemic heart disease (IHD), congestive cardiac failure (CCF) were included along with drugs used for other co-morbidities. The results were analyzed using descriptive statistics.

**Results:** Of 234 elderly patients, 124 (53%) were males and 110 (47%) were females. Hypertension was found in 208 (88.9%) patients, 66 (28.2%) had IHD and 4 (1.7%) had CCF. Drugs used for CVDs were beta blockers (BB) (30.77%), calcium channel blockers (CCB) (39.32%), angiotensin receptor blockers (ARB) (24.36%), angiotensin converting enzyme inhibitors (ACEIs) (20.94%) and diuretics (16.67%). Nitrates were prescribed for 66 (28.20%) patients and antiplatelet agents such as aspirin and clopidogrel were prescribed in 80 (34.19%) patients. Diabetes mellitus was found in 114 (48.7%) patients, 26 (11.1%) had bronchial asthma, followed by hyperlipidemia (3.8%), arthritis (3.8%), cerebrovascular accident (1.7%), and peripheral neuropathy, retinopathy and hypothyroidism was noted in 2 (0.9%) patients each.

**Conclusion:** Among the antihypertensive groups CCBs were the most commonly used followed by BB, ARBs and ACEIs. Among these antihypertensive agents amlodipine, losartan, atenolol and enalapril were most commonly used. Commonly used antidiabetic agents were metformin and glimepiride.

**Keywords:** Elderly, Cardiovascular diseases, Hypertension, Ischemic heart disease, Congestive cardiac failure, Diabetes mellitus

**INTRODUCTION**

The elderly population is rapidly increasing in the world. The Indian aged population is currently the second largest in the world.<sup>1</sup> Use of drugs in the form of prescription or over the counter medications plays an important role in the prevention of morbidity and mortality in older adults with chronic conditions. Cardiovascular diseases (CVDs) are the leading cause of death<sup>2</sup> among elderly patients and are a major reason for drug prescription.

CVD includes coronary heart disease, hypertension, congestive heart failure, peripheral artery disease, stroke and rheumatic heart disease. CVDs are interlinked with other conditions such as hyperlipidemia and hypertension.<sup>3</sup> Various combinations of drugs are available for the

management of CVD. The treatment options for CVDs are vasodilators, beta blockers (BB), angiotensin converting enzyme inhibitors (ACEIs), angiotensin receptor blockers (ARBs), calcium channel blockers (CCBs), diuretics, antiplatelet and lipid-lowering agents. The most important factor in the treatment of either subclinical or clinical CVD is the presence of co-morbidities. Non-CVDs are also connected with cardiac complications such as diabetes, obesity, and depression. In India, the CVD epidemic appears to overlap with the epidemic of diabetes.

Population-based trends in drug use have important implications for patient health outcomes, drug treatment and other health services.<sup>4</sup> The present study was primarily intended to analyze the drug usage trends in elderly with CVDs.

**METHODS**

A retrospective cross-sectional descriptive study was conducted for a period of 6 months in an out-patient department at a tertiary care teaching hospital. After obtaining approval from the institutional ethics committee, the case record files were retrieved from the medical records department. The medical records of 234 elderly (age ≥60 years) patients with CVDs were reviewed. Drugs prescribed for the above mentioned CVDs along with patients’ demographic data and other drugs used for other co-morbidities were collected on a patient proforma. The drugs used by the patient at the time of their last visit to the clinic were considered. The results were analyzed using descriptive statistics.

**RESULTS**

A total of 234 elderly patients’ data were collected. Of these, 124 (53%) were males, and 110 (47%) were females. Table 1 shows the demographic data and the co-morbid conditions associated with CVDs.

Table 2 shows the drugs used for CVDs and diabetes mellitus. Among the drugs used for CVD, calcium channel blockers (CCB) were the most used, followed by antiplatelet drugs, BB, nitrates, ARB, ACEI, diuretics and atorvastatin. Among the CCBs amlodipine; among the antiplatelet aspirin; among

the BBs atenolol; among the ARBs losartan; among the ACEIs enalapril and among the diuretic hydrochlorothiazide were more commonly used cardiovascular drugs. Diabetes mellitus was the main comorbid condition associated with CVD. Metformin and sulfonylureas were the antidiabetics used. Other drugs used for comorbid conditions were amitriptyline, bronchodilators like salbutamol, terbutaline, tiotropium bromide, antihistaminics like cetirizine, levocetizine, desloratidine, analgesics such as piroxicam, diclofenac, ibuprofen, antiulcer agents like ranitidine, pantoprazole, and omeprazole.

Distribution of patients according to drug combination for CVD is shown in Table 3. Out of 139 patients on monotherapy, 41 patients were only on CCBs. In two-drug combinations, BBs plus CCBs and CCBs plus ACEIs were prescribed the most. In three-drug combinations, BBs plus CCBs plus ARBs and BBs plus CCBs plus ACEIs were highest. In four-drug combination BBs, ARB, CCB and hydrochlorothiazide were commonly prescribed (Table 3).

**Table 1: Demographic data, CVDs with co-morbidities.**

Characteristics	Number (%)
Age (years) (mean)	69.41±6.52
Gender	
Male	124 (53)
Female	110 (47)
CVD	
Hypertension	208 (88.9)
IHD/CAD	66 (28.2)
CCF	4 (1.7)
Co-morbidities	
Diabetes	114 (48.7)
Respiratory disorder	26 (11.1)
Dyslipidemia	9 (3.8)
Arthritis	9 (3.8)
Cerebrovascular accident	4 (1.7)
Hypothyroidism	2 (0.9)
Neuropathy	2 (0.9)
Retinopathy	2 (0.9)
Depression	1 (0.4)

IHD: Ischemic heart disease, CAD: Coronary artery disease, CCF: Congestive cardiac failure, CVDs: Cardiovascular diseases

**Table 2: Drugs used for CVDs and diabetes mellitus.**

Drugs	Number (%)
Drugs for cardiovascular diseases (N=234)	
Calcium channel blockers	92 (39.32)
Beta blockers	72 (30.77)
Angiotensin receptor blockers	57 (24.36)
Angiotensin converting enzyme inhibitors	49 (20.94)
Diuretics	39 (16.67)
Nitrates	66 (28.20)
Antiplatelet drugs	80 (34.19)
Atorvastatin	31 (13.24)
Drugs used for diabetes mellitus (N=114)	
Sulfonylureas	63 (52.26)
Metformin	80 (70.17)
Thiazolidinedione	19 (16.67)
Alpha glucosidase inhibitor	8 (7.01)
Insulin	25 (21.93)

CVDs: Cardiovascular diseases

**Table 3: Distribution of patients according to the number of drugs for CVDs.**

Drug combination	Number of patients (%)
Monotherapy	139 (59.40)
Two-drug combination	66 (28.20)
Three-drug combination	21 (8.97)
Four-drug combination	7 (2.99)
Five-drug combination	1 (0.42)

CVDs: Cardiovascular diseases

## DISCUSSION

CVD is a common health problem in the world and a major cause of premature morbidity and mortality in the elderly.<sup>5</sup> It has been predicted that by 2020, there would be an 111% increase in cardiovascular deaths in India compared with other Asian countries or in developed countries.<sup>6</sup>

Hypertension was the most prevalent CVD in our study followed by ischemic heart disease (IHD) and congestive heart failure. These findings are similar to that of HG Zaveri et al.<sup>7</sup> who also found that among the CVDs most common was hypertension followed by coronary artery disease and congestive heart failure. In the present study CCBs and BB are the most commonly used drugs for hypertension and this is comparable to a study done by Tiwari et al.<sup>8</sup> As these agents have cardio-protective and antihypertensive effects, use of these agents are justified. Hypertension is strongly associated with diabetes mellitus, and the selection of antihypertensive in these patients is usually ARBs or ACEIs as these agents increase insulin sensitivity, reduce blood pressure and proteinuria, and provide long-term cardiovascular protection.<sup>9,10</sup> In our study also majority of diabetic patients were on ARBs or ACEIs. Use of diuretic was less compared with other agents could be due to the adverse effect on glucose homeostasis and lipid profile.<sup>11</sup> All the patients who had IHD were on nitrates as these were the preferred option as prophylaxis and for the relief of angina attack. Among the antiplatelet agent's aspirin was the most commonly used and this may be due to its multiple indications in the management of CVDs such as myocardial infarction, stroke and IHD. Among the statins, atorvastatin was used the most as it has shown beneficial effects for the primary and secondary prevention of CVD. Monotherapy in 59.4% and two-drug combinations in 28.2% patients were prescribed for CVDs and are not analyzed separately as almost similar classes of drugs are used for IHD and hypertension.

Diabetes mellitus (48.7%) was the most common comorbidity in patients with CVD. Among the antidiabetic agents, metformin and second-generation sulfonylureas (glimepiride, glibenclamide) were the most common agents used followed by insulin preparation.

## CONCLUSION

Among the antihypertensive groups, CCBs was the most commonly used followed by BB, ARB and ACEIs. Among these antihypertensive agents amlodipine, losartan, atenolol and enalapril were most commonly used.

Commonly used antidiabetic agents were metformin and glimepiride.

*Funding: No funding sources*

*Conflict of interest: None declared*

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

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doi: 10.5455/2319-2003.ijbcp20140833

Cite this article as: Shastry R, Bethi Y, Sowjanya, Kumar JU. Trends in drug usage among elderly with cardiovascular diseases. *Int J Basic Clin Pharmacol* 2014;3:723-5.