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A Study on the Assessment of Risk Factors and Evaluation of Prescribing Pattern in Patients with Hyperkalemia Having Cardiovascular Disorders

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ABSTRACT

Objectives: To assess the risk factors and to evaluate the prescribing patterns in patients with hyperkalemia having cardiovascular disorders. **Methods:** Among 264 patients, 172 patients were with cardiovascular diseases. The risk of hyperkalemia increases with various heart diseases like Ischemic heart disease, Arrhythmia, Coronary artery disease, Congestive heart failure. The percentage was calculated using Microsoft Excel. **Results:** There was total of 172 patients with cardiovascular disease in which age group 61-70 years (40.11%), male gender (66.86%) with Diabetes mellitus as co-morbidity (64.53%) were the most common cases. Ischemic heart disease (94.76%) was found to be the most commonly found heart disease. 100% of drugs were prescribed in brand names and the anti-hypertensive agents were prescribed commonly (96.18%). The drug Atorvastatin was prescribed the most (83.72%). The commonly prescribed brand name and their doses were also determined. The risk factors and severity of hyperkalemia were determined. Most of the patients were with mild hyperkalemia (62.20%) and their risk factor was found to be disease induced (71.50%). 63.95% of prescriptions were prescribed with Furosemide for the management of hyperkalemia. 94.18% of prescriptions included polypharmacy. **Conclusion:** The risk factors of hyperkalemia in cardiovascular disease patients and the prescribing pattern in those patients were studied. There are high risks of getting hyperkalemia in cardiovascular patients and this is concluded by the obtained results.

INTRODUCTION

Hyperkalemia is a common condition in patients with heart failure, often asymptomatic or associated with mild, non-specific symptoms, and discovered on routine laboratory tests[1]. Patients with chronic kidney disease (CKD), heart failure (HF), and diabetes mellitus (DM), and those using rennin- angiotensin- aldosterone system inhibitors (RAASi) are at 2 to 3 times higher risk for hyperkalemia. In hospitalized patients admitted with worsening heart failure, despite aggressive dieresis, increases in serum potassium levels are observed[2]. However, patients with heart failure frequently show co-morbidities and a certain degree of renal failure, a factor known as independent death predictor in patients with heart failure. Therefore, the risk of severe hyperkalemia during the treatment is significant. In this way, patients who benefit more from the use of rennin-angiotensin system blockers are those at higher risk of developing hyperkalemia[3].

Multiple physiological mechanisms contribute to potassium homeostasis, and consequently, serum potassium levels are generally well regulated. Recent studies have shown that optimal potassium levels are different from those known previously, and suggested lower threshold levels for hyperkalemia[4].

Hyperkalemia in patients with heart failure: Role of renal disease and therapy

The patients, by virtue of their disease, co-morbidities, and medical therapy, are at risk for hyperkalemia. Hyperkalemia can be classified into two types:

1. Inherent hyperkalemia: includes hormonal disorders (e.g., Addison's disease, hyporeninemic hyperaldosteronism), diabetes mellitus, CKD, and diseases with cell membrane instability that can cause intracellular and extracellular shifts; and

2. Treatment-related hyperkalemia: medications (e.g., RAASi, mineralocorticoid receptor antagonists, NSAIDs, diuretic agents, heparin).

In addition, excess dietary intake of foods high in potassium or sodium supplements containing high potassium content cause hyperkalemia[2].

Electrocardiographic manifestations of hyperkalemia vary from classic sine- wave rhythm, which occurs in severe hyperkalemia, to nonspecific repolarization abnormalities seen with mild elevation of potassium[5].

Accepted treatments for hyperkalemia include (1) stabilization of electrically excitable membranes by administration of calcium; (2) shift of potassium from extracellular to the intracellular compartment by means of sodium bicarbonate, insulin or albuterol; and (3) removal of potassium from the sodium polystyrene exchange resins or dialysis[6].

The aim of this study is to assess the risk factors and evaluate the prescribing pattern in patients with hyperkalemia having cardiovascular disorders and to update the knowledge about the risk factors of hyperkalemia in patients having cardiovascular disorders and to evaluate the prescribing pattern in those patients for a future prevention and better therapeutic approaches.

MATERIALS AND METHODS

STUDY SITE

A prospective study was carried in a private hospital, Palakkad District. It is a 100 bedded super specialty hospital and a major referral cardiac center in Palakkad.

STUDY DURATION

The data collection was carried out for a period of 4 months (August 2017 to November 2017).

DATA COLLECTION

The data of the patients with cardiovascular disorders were collected with the help of pre-designed data entry forms. The data were sorted and the percentage was calculated by using Microsoft Excel.

STUDY POPULATION

Out of 264 cases collected, 172 cases were included and rest of the cases was excluded.

STUDY CRITERIA

Inclusion criteria: All inpatients with hyperkalemia associated with cardiovascular disorders were included.

Exclusion criteria: Cases with insufficient data were excluded.

RESULTS

Table. 1 Age wise distribution

Sl. No.	Age (Years)	Number of prescriptions (n=172)	Percentage (%)
1	≤30	0	0
2	31-40	2	1.16
3	41-50	6	3.48
4	51-60	23	13.37
5	61-70	69	40.11
6	71-80	45	26.16
7	81-90	25	14.53
8	≥90	2	1.16

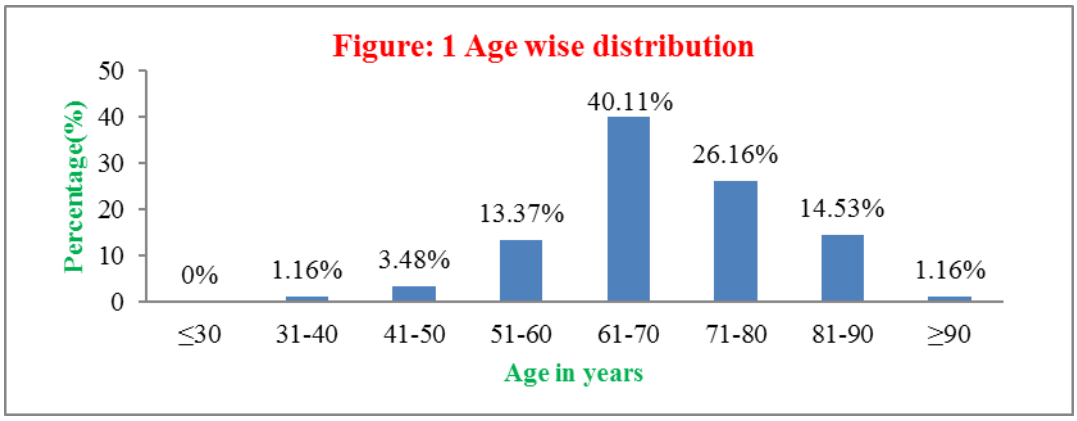


Table. 2 Distribution according to gender

Sl. No.	Gender	Number of prescriptions (n=172)	Percentage (%)
1	Male	115	66.86
2	Female	57	33.13

Figure: 2 Distribution according to Gender

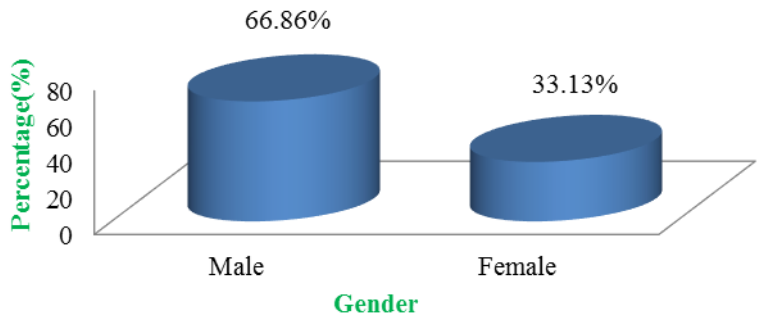


Table.3 Based on co-morbid conditions

Sl. No.	Co-morbid conditions	Number of prescriptions (n=172)*	Percentage (%)
1	Diabetes mellitus	111	64.53
2	Hypertension	101	58.72
3	Anemia	12	6.97
4	Hypothyroidism	14	8.13
5	Hyperkalemia	17	9.88
6	Others	27	15.69

**n=172; Total will not correspond to 100% due to multiple co-morbid conditions.*

Figure : 3 Based on co-morbid conditions

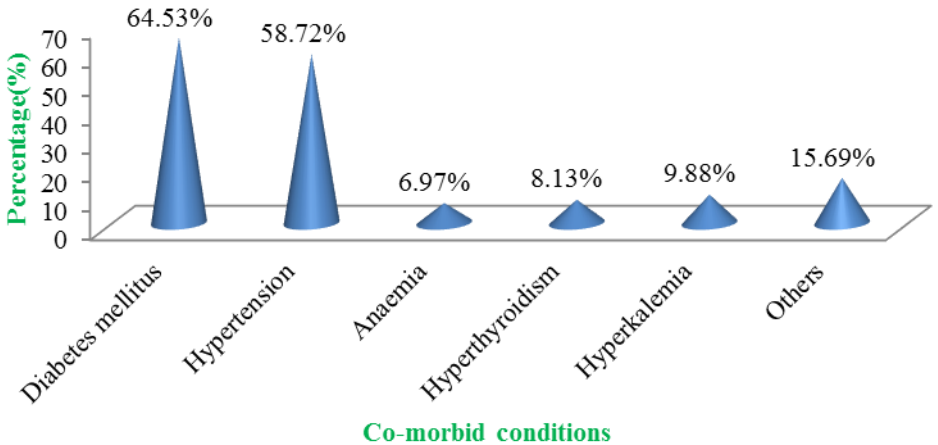


Table. 4 Distribution according to cardio vascular diseases

Sl. No.	Cardiovascular diseases	Number of prescription (n=172)*	Percentage (%)
1	Ischaemic heart disease	163	94.76
2	Myocardial infarction	22	12.79
3	Arrhythmia	0	0
4	Coronary artery syndrome	20	11.62
5	Left & right ventricular failure	41	23.8
6	Congestive heart failure	6	3.48

**n=172; Total will not correspond to 100% because of multiple cardiovascular diseases.*

Figure: 4 Distribution according to cardiovascular diseases

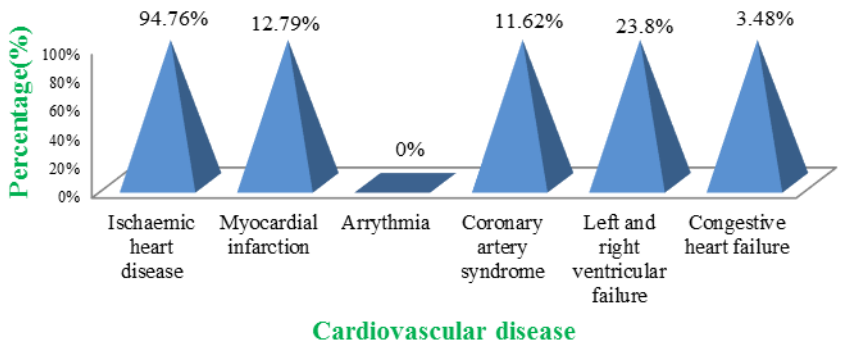


Table. 5 Pattern of drug prescriptions

Sl. No.	The pattern of drug prescription	Number of prescription (n=172)	Percentage (%)
1	Drugs prescribed in brand name	172	100
2	Drugs prescribed in the generic name	0	0

Figure: 5 Pattern of drug prescriptions

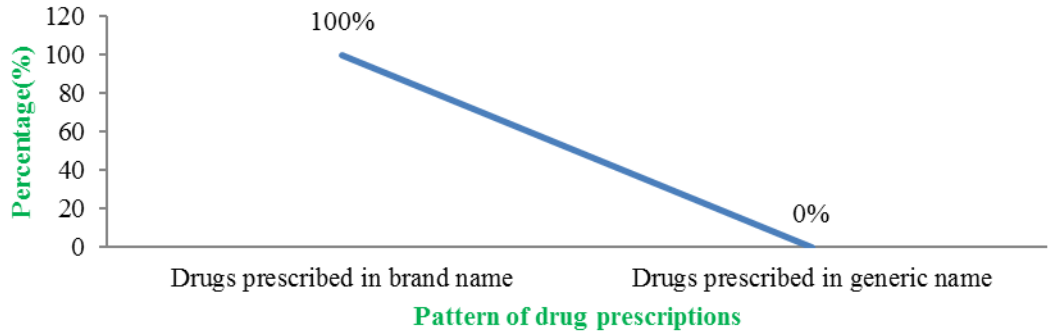


Table.6 Distribution according to the commonly prescribed drug class

Sl. No.	Drug class	Number of prescription (n=172)*	Percentage (%)
1	Antiplatelets	147	85.46
2	Antihyperlipidemic	131	76.16
3	Antibiotics	97	56.39
4	Antianginal	90	52.32
5	Anti hypertensive	162	94.18
6	Cardiac glycosides	41	23.83

**n=172; Total will not correspond to 100% because of multiple drug class.*

Figure: 6 Distribution according to commonly prescribed drug class

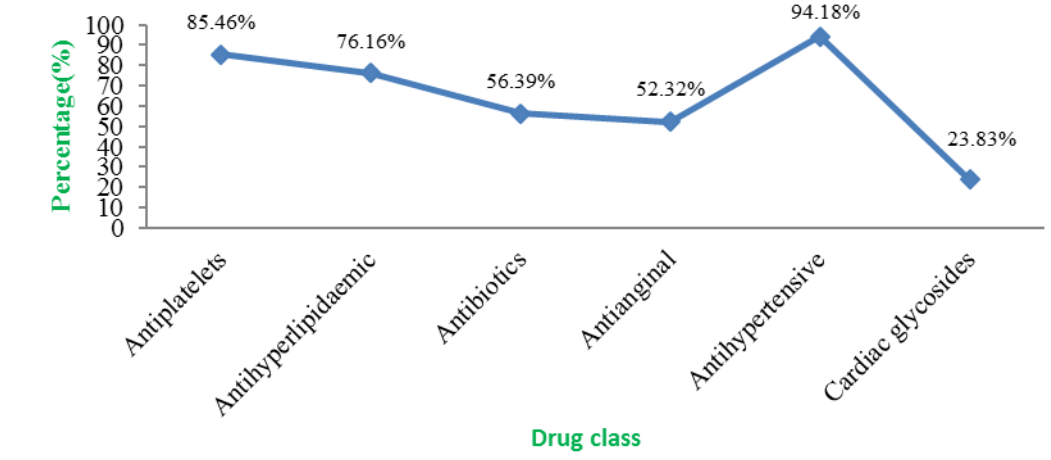
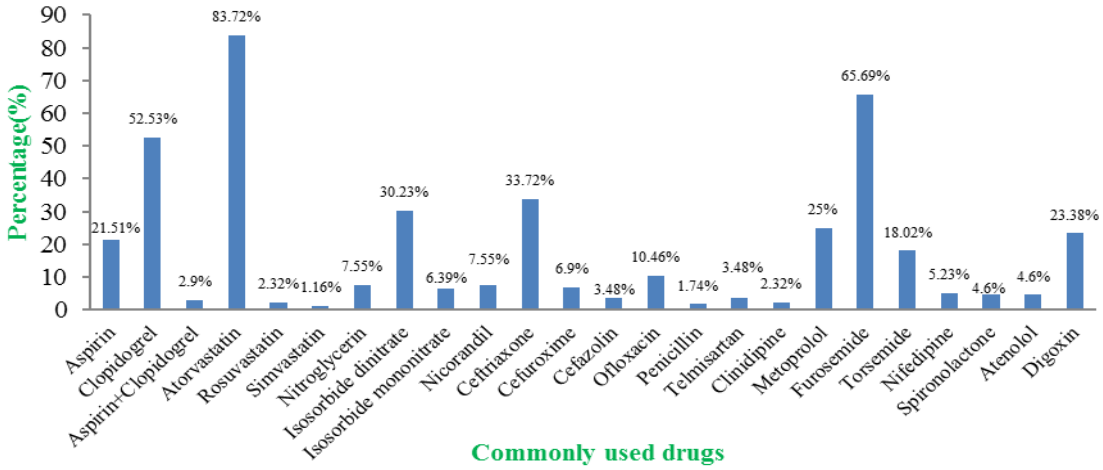


Table. 7: Distribution according to commonly used drugs

Sl. No.	Drug class	Commonly used drugs	Number of prescriptions (n=172)*	Percentage (%)
1	Anti platelets	i. Aspirin ii. Clopidogrel iii. Aspirin + Clopidogrel	37 90 5	21.51 52.32 2.90
2	Anti hyperlipidemic	i. Atorvastatin ii. Rosuvastatin iii. Simvastatin	144 4 2	83.72 2.32 1.16
3	Anti anginal	i. Nitroglycerin ii. Isosorbide dinitrate iii. Isosorbide mono nitrate iv. Nicorandil	13 52 11 13	7.55 30.23 6.39 7.555
4	Antibiotics	i. Ceftriaxone ii. Cefuroxime iii. Cefazolin iv. Ofloxacin v. Pencillin	58 12 6 18 3	33.72 6.9 3.48 10.46 1.74
5	Anti hypertensive	i. Telmisartan ii. Clinidipine iii. Metoprolol iv. Furosemide v. Torsemide vi. Nifedipine vii. Spirnolactone viii. tenolol	6 4 43 113 31 9 8 8	3.48 2.32 25 65.69 18.02 5.23 4.6 4.6
6	Cardiac glycosides	Digoxin	41	23.83

Figure: 7 Distribution according to commomly used drugs



**n=172; Total will not correspond to 100%.*

Table. 8 Distribution according to commonly prescribed brand names

Sl. No.	Drug class	Commonly prescribed brand names	Number of prescriptions (n=172)*	Percentage (%)
1	Anti platelet	Aspirin		
		i. Ecospirin	26	15.11
		ii. Dispirin	44	25.58
		Clopidogrel		
		i. Clopilet	53	30.81
		ii. Plavix	47	27.32
		iii. Deplatt	18	10.46
		iv. Clopitab	5	2.90
		Clopidogrel+aspirin		
		i. Clodrel plus	3	1.16
2	Anti hyperlipidemic	Atorvastatin		
		i. Atocor	32	18.60
		ii. Avas	44	25.58
		iii. Atorva	24	13.95
		iv. Storvas	32	18.60
		Rosuvastatin		
		i. Rozat	3	1.74
		ii. Rosuvas	2	1.16
		Simvastatin		
		i. Zosta	2	1.16
3	Anti anginal	Nitroglycerin		
		i. Nitrocontin	6	3.48
		ii. Angi plat	3	1.74
		Isosorbide dinitrate		
		i. Sorbitrate	38	22.09
		ii. Isordil	13	7.55

		iii. Isolazine	1	0.58
		Isosorbide mononitrate	3	1.74
		i. Ismo	4	2.32
		ii. Imdur	5	2.90
		iii. Nitrofix		
		Nicorandil	6	3.48
		i. Nikoran	4	2.32
		ii. Korandil	3	1.74
		iii. K.cor		
4	Antibiotics	Ceftriaxone		
		i. Ofromax	27	15.69
		ii. Cefixime	26	15.11
		iii. Ceftrix	5	2.90
		Cefuroxime		
		i. Ceftum	6	3.4
		ii. Ceroxim	7	4.06
		Ofloxacin		
		i. Zanocin	18	10.46
		Pencillin		
		i. Ampicillin	3	1.74
		Cefazoline		
		i. Cefacidal	2	1.16
		ii. Cefrine	4	2.32
5	Anti hypertensive	Furosemide		
		i. Lasix	113	65.69
		Metoprolol		
		i. Metzok	11	6.39
		ii. Betaloc	32	18.60
		Verapamil		
		i. Isoptin SR	2	1.16
		Spironolactone		
		i. Aldactone	8	4.65
		Atenolol		
		i. Altol	8	4.65
		Torsemide		
		i. Tortas	26	15.11
		ii. Demadex	5	2.90
		Nifedipine		
		i. Adalat	3	1.74
		ii. Procardia	6	3.48
		Carvedilol		
		i. Coreg CR	6	3.48
		Telmisartan		
		i. Micardis	1	0.58
		ii. Telmilex	2	1.16
		iii. Telma AM	3	1.74
6	Cardiac glycosides	i. Digoxin	40	23.25
		ii. Lanoxin	1	0.58

**n=172; Total will not correspond to 100%.*

Table. 9 Distribution according to commonly prescribed drug doses

Sl. No.	Drug class	Commonly prescribed brand names	Drug dose	Number of prescriptions (n=172%)*	Percentage (%)
1	Antiplatelets	Aspirin			
		i. Ecospirin	150 mg	14	8.13
			75 mg	12	6.9
		ii. Dispirin	325 mg	34	19.76
			300 mg	10	5.81
		Clopidogrel			
		i. Clopilet	75 mg	39	22.67
			30 mg	7	4.06
			100 mg	7	4.06
		ii. Plavix	75 mg	47	2.32
		iii. Deplatt	75 mg	18	10.4
2	Anti hyperlipidemic	Atorvastatin			
		i. Atocor	10 mg	21	12.20
			20 mg	7	4.06
			40 mg	4	2.32
		ii. Avas	10 mg	13	7.55
			20 mg	16	9.30
			40 mg	15	8.72
		iii. Atorva	10 mg	4	2.32
			20 mg	6	3.48
			40 mg	14	8.13
		iv. Storvas	40 mg	17	9.88
			20 mg	4	232
			10 mg	11	6.39
		Rosuvastatin			
		i. Rozat	10 mg	4	2.32
3	Anti anginal	Nitroglycerin			
		i. Nitrocontin	2.6 mg	6	3.48
		ii. Angi plat	6.5 mg	2	1.16
			2.6 mg	1	0.58
		Isosorbide dinitrate			
		i. Sorbitrate	5 mg	18	10.46
			10 mg	19	11.04
		ii. Isordil	10 mg	13	77.55
		Isosorbide mononitrate	20 mg	2	1.16
		i. Ismo	40 mg	1	0.58
			30 mg	6	3.48
		ii. Nitrofix			
		Nicorandil	5 mg	4	2.32
		i. Nikoran	10 mg	2	1.16
			5 mg	4	2.32
		ii. Korandil			

4	Antibiotics	Ceftriaxone			
		i. Oframax	1 g	26	15.11
		ii. Cefixime	200 mg	1	0.58
		iii. Ceftrix	400 mg	26	15.11
		Cefuroxime	250 mg	5	2.90
		i. Ceftum			
			500 mg	4	2.32
		ii. Ceroxim	250 mg	2	1.16
			500 mg	4	2.32
		Ofloxacin	250 mg	3	1.74
		i. Zanocin			
		Cefazolin	200 mg	17	9.88
		i. Cefacidal			
		ii. Cefrine	500 mg	2	1.16
		Pencillin	250 mg	4	2.32
		i. Ampicillin			
			500 mg	3	1.74
5	Cardiac glycosides	i. Digoxin	125 mcg	13	7.55
			250 mcg	20	11.2
			500 mcg	6	3.48
		ii. Lanoxin	125 mcg	1	0.58
6	Antihypertensive	Furosemide			
		i. Lasix	20 mg	65	37.79
			40 mg	32	18.60
			80 mg	16	9.30
		Metoprolol			
		i. Toprol	25 mg	3	1.74
			50 mg	2	1.16
		ii. Betoloc	25 mg	28	16.27
			50 mg	4	2.32
		Verapamil			
		i. Isoptin SR	10 mg	2	1.16
		Spiranolactone			
		i. Aldactone	25 mg	4	2.32
			50 mg	1	0.58
		Torsemide			
		i. Tortas	10 mg	21	12.20
			20 mg	5	2.90
		ii. Demadex	10 mg	1	0.58
			20 mg	4	2.32
		Nifedipine			
		i. Adalat	30 mg	3	1.74
		ii. Procardia	30 mg	5	2.90
			60 mg	1	0.58
		Carvedilol			
		i. Coreg CR	3.125mg	6	3.48
		Telmisartan			
		i. Micardis	20 mg	1	0.58

		ii. Telmix iii. Telma AM	5 mg 40 mg	2 3	1.16 1.74

**n=172; Total will not correspond to 100%.*

Table.10 Distribution according to risk factors of hyperkalemia

Sl. No.	Risk factors	Number of prescriptions (n=172)*	Percentage (%)
1	Drugs	96	55.81
2	Disease	123	71.51
3	Food habits	5	2.90
4	Adverse drug reaction	103	59.88
5	Drug interaction	18	10.46

**n=172; Total will not correspond to 100% because of multiple factors.*

Figure: 8 Distribution according to risk factors of hyperkalemia

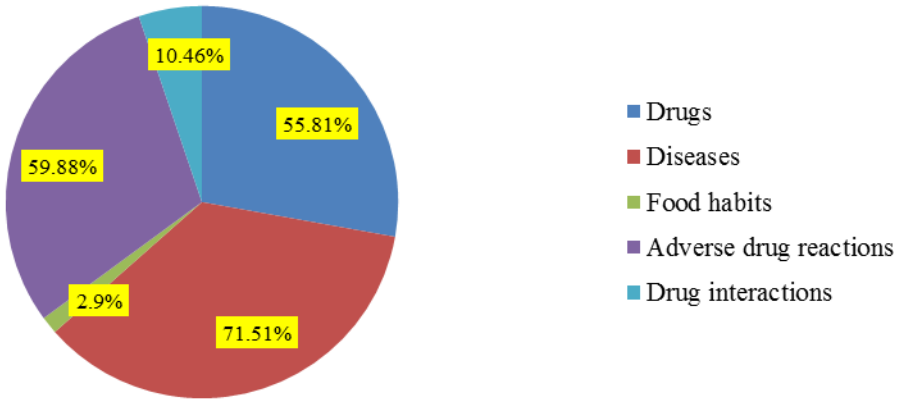


Table.11 Distribution according to the severity of hyperkalemia

Sl. No.	Severity	Number of prescriptions (n=172)	Percentage (%)
1	Mild	107	62.20
2	Moderate	45	26.16
3	Severe	20	11.62

Figure: 9 Distribution according to severity of hyperkalemia

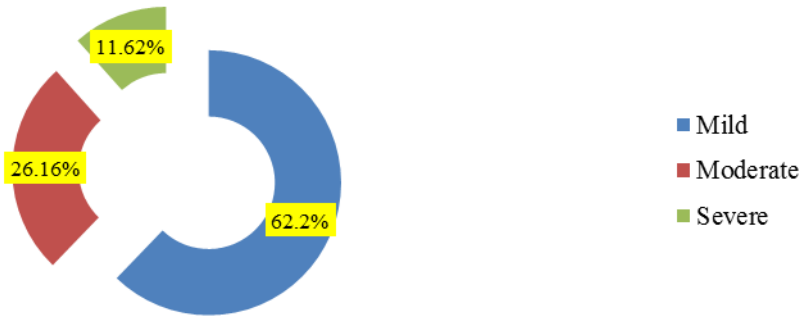


Table.12 Distribution according to the management of hyperkalemia

Sl. No.	Drugs used	Number of prescriptions (n=172)*	Percentage (%)
1	Furosemide	110	63.95
2	Calcium carbonate	7	4.06
3	Calcium gluconate	2	1.16
4	Insulin	87	50.58
5	Calcium polystyrene sulphonate	8	4.65
6	Salbutamol	21	12.20

**n=172; Total will not correspond to 100%.*

Figure: 10 Distribution according to Management of hyperkalemia

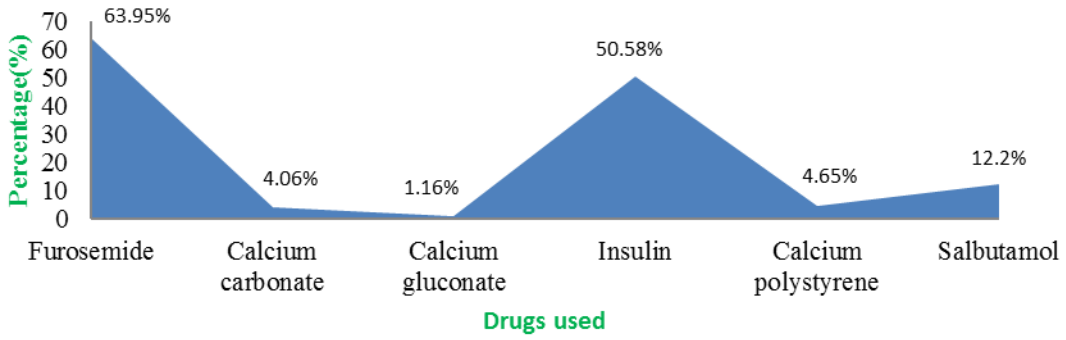


Table.13 Distribution according to the duration of therapy

Sl. No.	Number of days	Number of prescriptions (n=172)	Percentage (%)
1	≤3	43	25
2	4	50	29.06
3	5	53	30.81
4	6	13	7.55
5	7	3	1.74
6	8	4	2.32
7	≥9	6	3.48

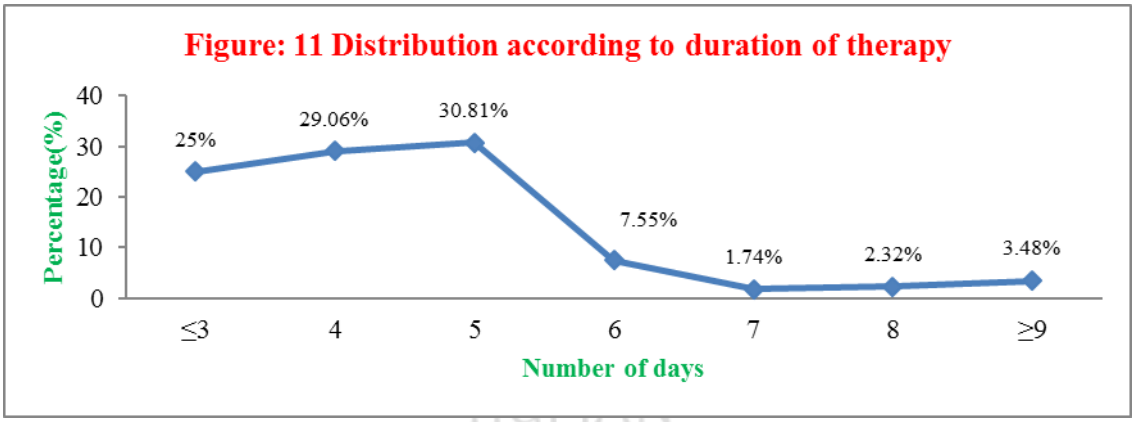
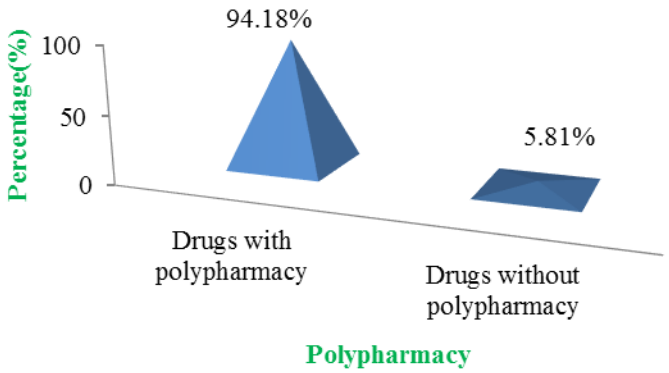


Table.14 Distribution according to polypharmacy

Sl. No.	Polypharmacy	Number of prescriptions (n=172)	Percentage (%)
1	Prescriptions with polypharmacy	162	94.18
2	Prescriptions without polypharmacy	10	5.81

Figure: 12 Distribution according to Polypharmacy



DISCUSSION

The main aim of this study was to assess the risk factors of hyperkalemia and to evaluate the prescribing factors in those patients with cardiovascular diseases.

Table: 1 and Figure: 1 shows that the cardiovascular patients with an age group of 61-70 (40.11%) have the high risk of getting hyperkalemia. Akshay S. Desai *et al* conducted a study and their results were age ≥75 years. The epidemiological variations and the study populations may be the reason for this change.

Table: 2 and Figure: 2 represent the distribution based on gender. In this study, male gender is having the high risk of getting hyperkalemia than females and it is about 66.86% of males with cardiovascular disease are having high risk. Another study conducted by Alexander Michel *et al* also shows that male gender is having the high risk of hyperkalemia than females.

Table: 3 and Figure: 3 indicate the distribution based on comorbidities. This study shows that patients with diabetes mellitus is the condition found in a majority of the patients as co-morbidity. It is about 64.53%. Luis A. Garcia Rodriguez *et al* conducted a study and their results were that Type 2 diabetes mellitus was also an independent predictor of hyperkalemia, which means the DM, is the most commonly seen comorbidity among hyperkalemic patients with cardiovascular disorders.

Table: 4 and Figure: 4 indicate the distribution according to the cardiovascular disease. In our study, the most common heart disease is found to be ischaemic heart disease that is about 94.76%. Michael H Alderman *et al* conducted a study and their results were that 11.1% of

coronary artery disease is the common heart disease. The results may vary among the study population. Another study conducted by Zafar. F *et al* concluded that hypertension and Ischemic heart disease was most commonly diagnosed cardiovascular diseases.

Table: 5 and Figure: 5 represent the distribution based on the pattern of drug prescriptions. This study shows that all the prescriptions were prescribed in brand names rather than in generic name.

Table: 6 and Figure: 6 show that distribution according to commonly prescribed drug class. This study shows that antihypertensive (94.18%), and antiplatelets (85.46%) was the most commonly prescribed drug classes among these patients. But in another study conducted by Kiran P. Vakade *et al*. shows that the most commonly prescribed drug classes are antihypertensive specifically, ARAs and ACEIs (56.10).

Table: 7 and Figure: 7 indicate the distribution according to commonly prescribed drugs. The most commonly prescribed drugs are Atorvastatin (83.72%), Furosemide (65.69%) and Clopidogrel (52.53%). Vandana M. Thorat *et al* conducted a study and resulted as Aspirin Clopidogrel combination (80.49%), Enoxaparin (75.61%), Atorvastatin (73.17%), Glyceryl trinitrate (73.17%) were the most commonly prescribed drugs. Variations may occur based on study site.

Table: 8 represent the distribution according to the commonly prescribed brand names. The commonly prescribed brand name of Aspirin is Dispirin (25.58%) and Clopidogrel is Clopilet (30. 81%).This is in case of antiplatelet drugs. In case of antihyperlipidaemic drugs, Avas is the commonly prescribed brand name for Atorvastatin that is about 25.58%.While Rosuvastatin is prescribed in the brand name of Rozat (1.74%) and Simvastatin as Zosta about 1.16%. Nitroglycerin under the class of Anti angina agents is prescribed as Nitrocontin (3.48%), Isosorbide dinitrate as Sorbitrate about 22.09%, Isosorbide mononitrate as Nitrofix about 2.90% and Nicorandil as Nikoran about 3.48%.

The Ceftriaxone of Antibiotics is commonly prescribed as Ofromax about 15.69%, while Cefuroxime as Ceroxim about 4.06%, Ofloxacin is prescribed asZanocin about 10.46%, Penicillin as Ampicillin about 1.74% and Cefazoline as Cefrine about 2.32%. Antihypertensive are prescribed as follows; Furosemide as Lasix (65.69%), Metoprolol as Betolac about 18.60%, Verapamil as Isoptin SR about 1.16%, Spironolactone as Aldactone about 4.65%, Atenolol as Altol for about 4.65%, Torsemide as Tortas about 15.11%,

Nifedipine as Procardia about 3.48%, Carvedilol as Coreg CR about 3.48% and Telmisartan as Telma AM for about 1.74%. In case of Cardiac glycosides, Digoxin is the most commonly prescribed brand name for Digoxin than that of Lanoxin. It is about 23.25%. Since various brand name is available for a single drug, variation may occur which depends upon different study site.

Table: 9 indicate the distribution based on commonly prescribed doses for drugs. Various doses are available for the single drug. In case of Aspirin of Antiplatelet drugs, Ecospirin 150mg (8.13%) and Dispirin 325mg (19.76%) is the commonly prescribed drug doses. While in case of Clopidogrel, Clopilet 75mg (22.67%), Plavix 75mg (2.32%), and Deplatt 75mg (10.4%) are the commonly prescribed doses. In case of Antihyperlipidaemic drugs, Atocor 10mg (12.20%), Avas 20mg (9.30%), Atorva 40mg (8.13%), and Storvas 40mg (9.88mg) are the commonly prescribed drug doses for Atorvastatin. While in case of Rosuvastatin Rozat 10mg (2.32%) is prescribed. Anti-angina drugs include, Nitrocontin 2.6mg (3.48%), Angiplat 6.5mg (1.16%) are the doses of Nitroglycerin. Sorbitrate 10mg (11.04%) and Isordil 10mg (77.55%) are the drug doses of Isosorbide dinitrate. Ismo 20mg (1.16) and Nitrofix 30mg (3.48%) are under Isosorbide mononitrate. Nikoran 5mg (2.32%) and Korandil 5mg (2.32%) are coming under Nicorandil. These are the commonly prescribed drug doses in case of Antianginal drugs. Ofromax 1g (15.11%), Cefixime 400mg (15.11%), and Ceftrix 250mg (2.90%) are the doses usually prescribes in case of Ceftriaxone. Ceftum 500mg (2.32%), Ceroxim 500mg (2.32%) are the doses in case of Cefuroxime. Ofloxacin is prescribed as Zanocin 200mg (9.88%). Cefacidal 500mg (1.16%), and Cefrine 250mg (2.32%) are the prescribed dose of Cefazolin. Ampicillin 500mg (1.74%) is the prescribed dose of Penicillin. These are the commonly prescribed dose of Antibiotics. Digoxin 250mcg (11.2%) and Lanoxin 125mcg (0.5%) are the commonly prescribed dose for cardiac glycosides. The antihypertensive is prescribed as follows; Furosemide as Lasix 20mg (37.79%), Metoprolol as Toprol 25mg (1.74%), Betolac 25mg (16.27%), Verapamil as Isoptin SR 10mg (1.16%), Spironolactone as Aldactone 25mg(2.32%), Torsemide as Tortas10mg (12.20%), Dermadex 20mg (2.32%), Nifedipine as Adalat 30mg (1.74%), Procardia 30mg (2.90%), Carvedilol Coreg CR 3.125mg (3.48%), Telmisartan as Micardis 20mg (0.58%), Telmix 5mg (1.16%), Telma AM 40mg (1.74%) are the commonly prescribed doses.

Table: 10 and Figure: 8 represent the distribution according to risk factors for hyperkalemia. This study concludes that disease (71.51%) is the major risk factor of hyperkalemia. A study

conducted by Peter van der Meer *et al* concluded their study as hyperkalemia is observed in patients often using ACEIs and mineralocorticoid receptor antagonists.

Table: 11 and Figure: 9 indicate the distribution according to the severity of hyperkalemia. Here, most of the patients are with mild hyperkalemia (62.20%). Jasper Tromp *et al* conducted a study and their results were as follows; low potassium level was present in 6% patients, high potassium levels in 9% of patients.

Table: 12 and Figure: 10 represent the distribution according to the management of hyperkalemia. The most commonly prescribed drug for the management of hyperkalemia is Furosemide (63.95%). Variations may occur depending upon the study site.

Table: 13 and Figure: 11 represent the distribution according to the duration of therapy. Most of the patients have undergone therapy for 3 days (30.81%). This is because, in this study, most of the patients are with mild hyperkalemia.

Table: 14 and Figure: 12 indicate the distribution according to polypharmacy. In this study, most of the patients (94.18%) are prescribed with polypharmacy. This variation depends on different study sites.

CONCLUSION

The study was aimed to assess the risk factors and evaluate the prescribing pattern in patients with hyperkalemia having cardiovascular disorders. Out of 264 cases, there were 172 cases with hyperkalemia having cardiovascular disorders. The present study was provided many useful findings regarding the risk factors and prescribing pattern in patients. According to the result, the risk of hyperkalemia in cardiovascular disorders resulted by drugs, diseases, food habits, adverse drug reactions and drug interactions. Even though the greatest risk of hyperkalemia induced by the drugs used in cardiovascular disorders and in ischemic heart disease, there is more risk to occur hyperkalemia. Commonly prescribed drug classes includes antiplatelets, antihyperlipidemic, antibiotics, antianginal, antihypertensive and cardiac glycosides. All these classes of drugs are prescribed in brand names, from these the antihypertensive drugs causes more risk to induce hyperkalemia in cardiovascular disease patients.

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