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Research Article

DRUG USE EVALUATION OF ANTIHYPERTENSIVE MEDICATIONS IN OUT PATIENTS IN A SECONDARY CARE HOSPITAL

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ABSTRACT

Drug utilization research is defined as research on "the marketing, distribution, prescription and use of drugs in a society, with special emphasis on the resulting medical, social and economic consequences" and has the principle aim of facilitating the rational use of drugs, our study aims to identify consumption and cost consumption of antihypertensive medications in secondary care hospital. It is a prospective study conducted for the period of 4 months. The required data were collected from the pharmacy from the patient case sheet or through direct patient interview by using suitable patient profile form, and the obtained data were evaluated in relation to the drug use. ATC/DDD method was used to measure the outcome variables. Antihypertensive consumption increased from 10826.8 DDDs in March 2011 to 16437.75 DDDs in June 2011. Overall, the cost consumption has been increased to12523.93 Indian rupees from the initiation of study period to end of the study period. Our study results shows that consumption and cost consumption of antihypertensive drugs were increased during the study period. Increased Drug use and Cost consumption of antihypertensive medications in our study indicates the necessity of preventive care for hypertension and patient has to be provided with knowledge about life style modifications in hypertension to decrease the drug use.

Keywords: ATC, DDD, Drug and cost consumption

INTRODUCTION

Drug utilization research is defined as research on "the marketing, distribution, prescription and use of drugs in a society, with special emphasis on the resulting medical, social and economic consequences" and has the principle aim of facilitating the rational use of drugs[9]. Drug utilization research developed quickly and soon became a respectable subject for consideration at international congresses in pharmacology and epidemiology. Particularly rapid developments were seen in Australia and Latin America and successful research in drug utilization requires multidisciplinary collaboration between clinicians, clinical pharmacologists, pharmacists and epidemiologists. Without the support of the prescribers, this research effort will fail to reach its goal of facilitating the rational use of drugs. Drug utilization research is an essential part of pharmacoepidemiology as it describes the extent, nature and determinants of drug exposure.[1]Drug utilization studies are powerful tools to ascertain the role of drugs in the society. They provide a sound socio medical and health economic basis for health care decision making. To achieve this, it is very important to determine the drug use pattern and to monitor the drug use profiles.[2] Drug utilization data have a central role in the quality of care cycle and are essential to the management of policy related to drug supply, pricing cost and use/the anatomical therapeutic chemical(ATC) and defined daily dose(DDD) methodologies for classification and measurement can be helpful in following and comparing cost trends, but need to be used with caution. The purpose of the ATC/DDD system is to serve as tool for drug utilization research in order to improve drug use practices.[3]our study aims to identify consumption and cost consumption of antihypertensive medications in secondary care hospital. Besides that, the aim of the study was to identify the possible association between the increase or decrease in the utilization of antihypertensive drug groups.

MATERIALS AND METHODS

It is a prospective observational study conducted for the period of 4 months in a secondary care and patients who met the study criteria were included in the study. A total of 883 outpatients were included in this study regardless of gender with Antihypertensive drugs in their drug regimen. The required data were collected from the pharmacy or from the patient case sheet or through direct patient interview by using suitable patient profile form, and the obtained data were evaluated in relation to the drug use, and Outcome was measured by using WHO ATC/DDD system.

Following formulas are used to measure out comes:

DDD (Defined daily dose) =

$$\frac{\text{No. of items issued} \times \text{Amount of drug per item}}{\text{WHO recommended DDD OF DRUG}}$$

$$\text{DDD/1000Inhabitants/day} = \frac{\text{Total number of dosage X Strength of each Units prescribed dosage unit}}{\text{DDDX Duration of study X Total sample size}} \times 1000$$

RESULTS

Total of 1649 prescriptions were evaluated for antihypertensive drug use which has been dispensed to 883 patients for four months period. The prevalence of monotherapy is higher than combination therapy. Most frequently prescribed monotherapy is Calcium channel blockers and ACE Inhibitors.

Table 1 represents the consumption of antihypertensive medications on monthly basis and consumption data were shown in DDDs, among all the classification of antihypertensive medications Calcium channel blockers and ACE Inhibitors were mostly usedand their DDDs are 17728,16857 respectively.

Figure 1 represents the drug consumption in DDD/1000 inhabitants per day, which implies that Amlodipine has been the drug of choice for most of the patients around 16.36% of study population has been treated daily. Ramipril was next choice of treated to 15.53% of study population daily. Metaprolol was the least drug of choice with a percentage of 0.06 % daily.

In our study we observed that each prescription contains 3.07 drugs on an average, and also we observed that maximum number of drugs is prescribed by using their Generic name and Brand names in a prescription were depicted in table 2.

Table 3 depicts the cost consumption of each classification of antihypertensive medications and their drugs according to their DDDs used. Ca channel blockers consume huge cost among all the classes with a value of 47602.18 Indian Rupees as a whole, and theβ-blockers consumes with an amount of 25275 Indian Rupees. Even though consumption of Diuretics are moderately high (9013DDDs) but their cost consumption is low. Consumption of Amlodipine is

very high and Nifedipine, Propranolol consumes less cost for their total defined daily doses.

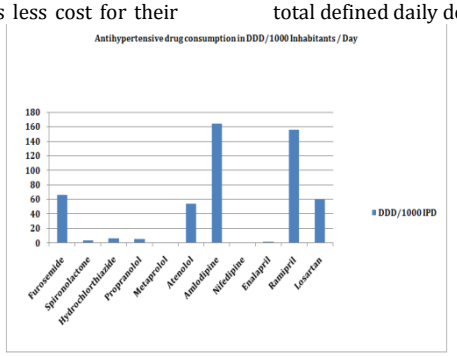

Figure 1:

Table 1: Total consumption of antihypertensive drugs.

Name of the drug	March	April	May	June	Total consumption in DDDS	Total no. of DDDs class wise
Diuretics						
Furosemide	1061	2344	1641	2062	7108	9010
Spironolactone	147	493	227	365	1232	
Hydrochlothiazide	30	45	150	445	670	
Total	1238	2882	2018	2872	9010	
β-blocking agents:						
Propranolol	12.5	112.7	50	47	222.2	6198.7
Metaprolol	58.5	35	45	47	186	
Atenolol	1264	1436	1474	1616	5790	
Total	1335	1583.7	1569	1710	6198.7	
Calcium channel blockers:						
Amlodipine	3665	4492	4329	5145	17631	17728
Nifedipine	30.8	8.3	38	20	97	
Total	3695.8	4500.3	4367	5165	17728	
ACE Inhibitors:						
Enalapril	90	71	8	33.75	203	16857
Ramipril	3568	4798	3808	4480	16654	
Total	3658	4869	3816	4513.75	16857	
Angiotensin II receptor blockers:						
Losartan	900	1695	1730	2177	6502	6502
Total	10826.8	15529.3	13500	16437.75	56295.9	

Table 2: Average number of generic names and brand names per prescription

Month	Total No. of prescriptions	Average No. of generic names in prescription	Percentage of generic name in prescription	Average No. of brand names in prescription	Percentage of brand names in prescription	Average No. of drugs per prescription
March	286	2.04	61.96%	1.25	38.14%	3.29
April	402	2.35	65.44%	1.23	34.56%	3.58
May	450	1.88	69.65%	0.82	30.35%	2.70
June	511	1.95	67.98%	0.93	32.02%	2.83
Total	1549	2.05	66%	1.02	34%	3.07

Table 3:

Brand or generic available in study site	WHO recommended DDD	Consumption of cost for utilized DDDs in rupees (%) March	April	May	June	Total
		838.596	3283.54	1558.76	2938.765	8619.661
Furosemide40mg	40mg	318.3	703.2	492.3	907.28	2421.08
Aldactone25mg	75mg	509.796	2564.59	1013.964	1875.735	5964.085
Hydrochlothiazide 25mg	25mg	10.5	15.75	52.5	155.75	234.5
		5166.191	9244.04	5034	5830.972	25275.2
Propranolol 40mg	160mg	9	82.95	36	34.592	162.542
Metolar-50 mg	150mg	1860.3	1183	1431	1494.6	5968.9
Atenolol 25mg	75mg	3296.89	7978.09	3567	4301.78	19143.76
		10388.01	11548.58	11151.07	14573.79	47661.45
Avacard 5mg	5mg		10371.95	11544.4	11125.53	14560.30
Nifedipine 5mg	30mg		16.06	4.18	25.536	13.44
		4729.84	6153.22	4649.09	5586.44	2111.59
Enalapril 5mg	10mg		412.56	347.64	41.412	153.54
Macpril 2.5 mg	2.5mg		4317.28	5805.58	4607.68	5432.9
Angiotensin II receptor blockers				3582	5267	22416.6
Losartan	Sort 25mg		50mg	3582	5267	22416.6
Total				24704.64	35496.38	125091.5

DISCUSSION

Totally 1649 outpatient prescriptions which have antihypertensive drugs in their prescription were collected from dispensing daily pharmacy.1649 prescriptions were dispensed to 883 patients in total four months study period. Some of them were repeated for the pharmacy to collect drugs.

From the data evaluation the average number of drugs per prescription was 3.07. In a study conducted Basaweshwar Teaching and General Hospital (BTGH), Gulbarga in 2010 it was range between 3.5 to 9.5.[4] but in 2011 on trauma care unit the number of drugs for a prescription was 4.5 to 9.5.[2]

In 1649 outpatient prescriptions percentage of monotherapy (60%) is high than combination therapy (40%). In monotherapy, Amlodipine (30%) and Ramipril (29%) were used more. In a combination therapy β-blockers with calcium channel blockers (22.6%) used more. A study conducted in U.S. adult people Polytherapy with a calcium channel blocker, β--blocker or angiotensin-converting enzyme inhibitor significantly increased by 30%, 42%, and 68%, respectively, whereas monotherapy with a diuretic or Beta blocker were significantly decreased.[5]

In a Diabetology outpatient setting of a tertiary hospital conducted a study and their results shows Generic name prescription was 74.38% [6]. In our study it was less; Generic name in prescription was 66% higher than Brand name in prescription was 34%.

In our study Amlodipine was used more than all other drugs (163.6 DDD/1000 IPD), Ramipril was ranked second with a high utilization (155.3 DDD/1000 IPD) and

Metaprolol was used very low (0.06 DDD/1000 IPD) than any other drugs. In Zagreb pharmacies [7] and in Kragujevac Clinical Hospital Center also ACE inhibitors were used more.[7] and in an antihypertensive utilization study in Spain, ACE inhibitors were used more.[8]

A study conducted at Spain on antihypertensive drugs they concluded that ACE Inhibitors cost consumption was high. In our study, results shows that cost consumption of Ca channel blockers were high, for individual drugs Amlodipine consumes more cost(47602.18), Nifedipine and Propranolol consumes very least cost (59.21, 162.5 Indian Rupees respectively). Among all other drugs table 4 represents the cost consumption of all antihypertensive classes and their drugs.

CONCLUSION

The study provides an overview about utilization of antihypertensive among our study patients in our hospital and could serve as a basis for further research, our result implies that there is an increased drug use and cost consumption of antihypertensive in our study period indicates the necessity of preventive care for hypertension and improving patient's knowledge on antihypertensive medications on all aspects will boost up the present health care in this settings.

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