IJPSR (2016), Vol. 7, Issue 10 (Research Article)

INTERNATIONAL JOURNAL OF PHARMACEUTICAL SCIENCES AND RESEARCH

Received on 06 May, 2016; received in revised form, 08 August, 2016; accepted, 23 September, 2016; published 01 October, 2016

ASSESSMENT OF ANTIHYPERTENSIVE DRUGS UTILIZATION PATTERN IN BUTAJIRA ZONAL HOSPITAL, BUTAJIRA TOWN, SOUTH ETHIOPIA

Diltata Busser, Raghavendra Yarlagadda *, Seid Mussa Ahmed

Jimma University, College of Health Sciences, Department of Pharmacy, Jimma, Ethiopia.

Keywords:

Hypertension, combination therapy, Butajira zonal hospital, Ethiopia

Correspondence to Author:
Raghavendra Yarlagadda

Assistant Professor,
Department of Pharmacy,
College of Health sciences,
Jimma University, Jimma, Ethiopia.

E-mail: raghavendra.rangarao@ju.edu.et

ABSTRACT: Background: Many factors contribute for prevalence of high blood pressure including poor treatment compliance, lack of access to health care and lack of physician adherence to therapeutics. In Ethiopia, routine health care report is incomplete and erratic and 90% individuals diagnosed with hypertension do not properly adhere to treatment. The present study was carried out to assess the antihypertensive drug utilization pattern in Butajira Zonal Hospital, Ethiopia. **Methodology:** A retrospective cross-sectional study was conducted on 486 patient cards of hypertensive patients from Jan, 23 2011 – Feb. 03, 2011 in Butajira Zonal Hospital, SNNPR, Ethiopia. **Results**: The hypertensive patients studied were female 267 (54.94%) and 271 (55.76%) were above 45 years of age. The common signs/symptoms and disease reported were headache 31(19.50%), congestive heart failure and urinary tract infection 23(14.46%). Combination therapy study on 275 patients shows 237(86.18%) and 38(13.82%) were on two and three drugs respectively. A total of 211 anti-hypertensive drugs were prescribed as mono-therapy out of them hydrochlorothiazide was mostly 123(58.29%) prescribed. A total of 198(100%) patients were taking non-steroids anti-inflammatory drugs, norfloxacin 15(7.58%), Digoxin 14(7.07%), Insulin 9(4.55%) and salbutamol 6(3.03%) were commonly co administered with anti-hypertensives. **Conclusion**: Diuretics were the most prescribed anti-hypertensive drugs in mono-therapy and combination therapy. The consumption of antihypertension drugs in the study area and Ethiopia as well is increasing which is similar other countries, but differences in the relative increase for each class of drug suggest that further study may be required to clarify the origins and causes.

INTRODUCTION: Hypertension is the most common problem seen in primary care and leads to myocardial infarction, stroke, renal failure, and death if not detected early and treated appropriately. Patients want to be assured that blood pressure (BP) treatment will reduce their disease burden, while clinicians want guidance on hypertension management using the best scientific evidence. [1]

QUICK RESPONSE CODE

DOI: 10.13040/IJPSR.0975-8232.7(10).4028-34

Article can be accessed online on: www.ijpsr.com

DOI link: http://dx.doi.org/10.13040/IJPSR.0975-8232.7 (10).4028-34

Blood pressure can be classified as 140/90 as high, 130/85 to 139/89 as high-normal and 129/84 and above as normal and life style changes was recommended along with medication. Primary hypertension occurs in 10–15% of white adults and 20–30% of black adults in the United States. Secondary hypertensions (5-10%) of patients have specific causes. [2] Hypertension is an important risk factor for the development of chronic renal insufficiency (CRI) and end stage renal disease (ESRD). [3]

The available regimens in Ethiopia include diuretics, beta-blockers (BBs), calcium channel blocker and Angiotensin converting enzyme inhibitor as first step agents. First line drugs for non-emergency conditions are hydrochlorothiazide

and/or nifedipine and/or propanol and enalapril or methyldopa is an alternative. [4] The principal cause of cardiovascular deaths is emerging as prominent public health problems in developing countries, ranking third with many 16% of all deaths. [5]

According to world health report 2002, cardiovascular disease accounted for 9.2% of total deaths in the African region and hypertension remains the most important risk factors with national prevalence level ranging from 25% to 35% in adults aged 25-64 years. Awareness, treatment and control of hypertension are extremely low in this region, as health care resources are overwhelmed by other priorities including HIV/AIDS, TB and malaria. [6] The reported prevalence of hypertension varied around the world with the lowest prevalence in rural India (3.4% in men and 6.8% in women) and the highest prevalence in Poland (68.9 in men and 72.5% in women). [7]

In developed countries arterial hypertension is the most prevalent cardiovascular disorder modifiable risk factor; it affects about 20% to 50% of the adult population in these countries. For every 20-mm Hg systolic or 10-mm Hg diastolic increase in BP, there is a doubling of mortality from both coronary heart disease and stroke. [8]

A study conducted in Ethiopia on patients with essential hypertension at Tikur Anbessa hospital concluded that Ethiopian hypertensives may respond better to diuretics than to beta blockers or angiotensin converting enzyme inhibitors. [9] Another research done in Sidama zone, Southern Ethiopia on hypertension obesity and central obesity in diabetics and non-diabetics showed that, the general prevalence of hypertension in the entire study population was 18.8% with 26.1% in diabetics and 10.2% in non-diabetics. [10]

In general, the principal aim of utilization pattern of anti-hypertensive drugs research is to facilitate the rational prescription of these drugs in the population. It increases our understandings of how these drugs are being prescribed. Appropriate use of anti-hypertensive drugs has huge global reduction in morbidity and mortality due to hypertension. Therefore, this study was conducted to assess the antihypertensive drug utilization pattern, to identity commonly prescribed anti-hypertensive drugs, to determine proportion of patients on mono-therapy and combination therapy, to assess physicians' compliance with standard treatment guideline, to assess the extent of drug interaction with anti-hypertensive agent in the treatment of hypertension in Butajira Zonal Hospital.

METHODS AND MATERIALS:

Study Area, Period and design: A retrospective cross-sectional study was carried out in Butajira Zonal Hospital, South Nations, Nationalities and People Region, Ethiopia. Butajira town is found at 135km South from Addis Ababa and the town has five kebeles with a total population of 41,345. The hospital has inpatient, outpatient and operation service. The study was conducted from January, 23 2011 – Feb. 03, 2011 on the hypertensive patient cards from January 1 – December 31, 2010.

Study design, study population Sample Size and sampling: Descriptive cross sectional study of hypertensive patient's history card from January 1 – December 31, 2010 in Butajira zonal hospital and the study population was 486 patient history cards.

Data Collection, Quality, analysis and interpretation: A well-designed data collection format containing the variables to be measured was used. Data was collected by using data abstraction format containing the variables to be measured. The data was collected from the patient history card. Data were collected by the nurses working in the hospital and principal investigator. The quality of the study was improved through training data collector on how and which data to be collected by staff workers. Data aanalysis was done by combinations of manual calculator and Vassar stats (statistical tables' calculator) and also SPSS 16 software package. The results were presented in absolute figures (percentages) as depicted in Tables and Figures.

Ethical Consideration: First, ethical clearance was obtained from institutional ethical review board of the college of health sciences, Jimma University. Then a formal letter was written from Jimma University, Pharmacy department to Butajira Zonal Hospital in order to get permission and co-operation to conduct the study. During data

collection culture and norms of the society was respected. Moreover, verbal consent was secured from each respondent.

RESULTS: The majority of hypertensive patients studied were female 267 (54.94%) and 271 (55.76%) were above 45 years of age (**Table 1**).

TABLE 1: SOCIO DEMOGRAPHIC CHARACTERISTICS OF HYPERTENSIVE PATIENTS IN BUTAJIRA ZONAL HOSPITAL FROM JAN.1 - DEC.31, 2010

		Age						
		<25	**25-34**	**35-44**	**45-54**	**55-64**	**>65**	**Total**
Sex	Male	13(2.68%)	23(4.74%)	39(8.02%)	51(10.49%)	58(11.93%)	35(7.2%)	219(45.06%)
	Female	20(4.11%)	45(9.26%)	75(15.43%)	68(13.99%)	48(9.88%)	11(2.27%)	267(54.94%)
Total		33(6.79%)	68(14.00%)	114(23.45%)	119(24.68%)	106(21.81%)	46(9.47%)	486(100%)

A total of 211 anti-hypertensive drugs were prescribed as mono-therapy during study period, out of them hydrochlorothiazide was the most prescribed 123(58.29%), followed by Nifidipine 61(28.91%) (As shown in the **Fig.1**).

Antihypertensive drugs prescribed:

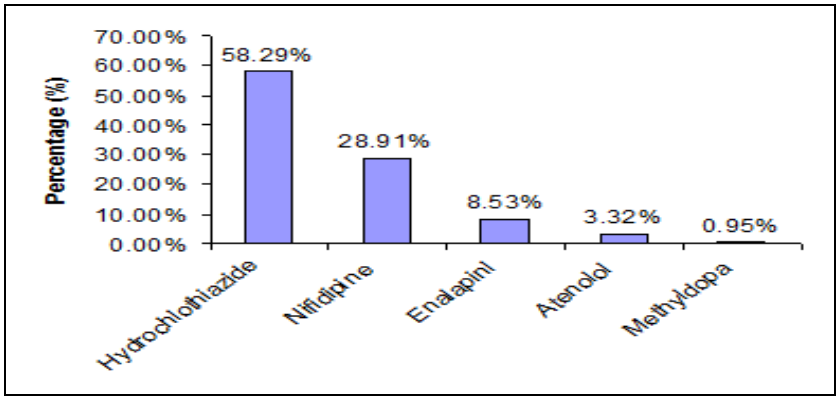

FIG. 1: PATTERN OF UTILIZATION OF ANTI-HYPERTENSIVE DRUGS MONO-THERAPY IN BUTAJIRA ZONAL HOSPITAL FROM JAN.1 - DEC.31, 2010

Out of 275 patients on combination therapy 237(86.18%) and 38(13.82%) were on two and three drugs respectively (**Table 2**).

TABLE 2: PATTERN OF PRESCRIBED ANTI-HYPERTENSIVE DRUG COMBINATIONS IN BUTAJIRA ZONAL HOSPITAL FROM JAN.1 - DEC. 31, 2010

Drug regimen	**Frequency (%)**	**Total**
Two drugs combinations		
Hydrochlorothiazide + Nifedipine	51(18.54%)	
Hydrochlorothiazide + Atenolol	30(10.91%)	
Nifidipine + Hydralazine	25(9.09%)	
Hydrochlorothiazide + Enalapirl	23(8.36%)	
Nifidipine + Enalapirl	21(7.64%)	
Nifidipine + Methyldopa	15(5.45%)	
Atenolol + Methyldopa	15(5.45%)	
Captopin + Furosemide	12(4.36%)	
Hydrochlorothiazide + Captopirl	10(3.64%)	237(86.18%)
Nifidipine + Furosemide	8 (2.91%)	
Hydralazine + Enalapirl	5 (1.82%)	
Enalapin + Furosemide	5 (1.82%)	
Nifidipine + Captopirl	3 (1.09%)	
Hydrochlorothiazide + Hydralazine	3 (1.09%)	
Hydralazine + Furosemide	3 (1.09%)	
Hydrochlorothiazide + Methyldopa	2 (0.73%)	
Hydralazine + Captopril	2 (0.73%)	

Hydrochlorothiazide + Propranalol	2 (0.73%)	
Hydralazine + Methyldopa	2 (0.73%)	
Three drugs combinations		
Hydrochlorothiazide + Atenolel + Enalapirl	10(3.64%)	
Hydrochlorothiazide + Nifedipine + Enalapirl	9 (3.28%)	
Hydrochlorothiazide + Atenolol + Hydralazine	5 (1.82%)	
Nifedipine + Enalapirl + Hydralazine	4 (1.45%)	
Hydrochlorothiazide + Nifedipine + Methyldopa	4 (1.45%)	38(13.82%)
Hydrochlorothiazide + Hydralazine + Enalapirl	2 (0.73%)	
Hydrochlorothiazide + Nifedipine + Spironolactone	1 (0.36%)	
Hydralazine + Nifedipine + Methyldopa	1 (0.36%)	
Hydrochlorothiazide + Nifedipine + Methyldopa	1 (0.36%)	
Hydrochlorothiazide + Nifedipine + Hydralazine	1 (0.36%)	
Total		275(100%)

Out of 275 patients on combination therapy 85(30.90%) and 115(41.82%) were stage 1 and stage 2 hypertensive blood pressure respectively. While 106(50.24%) and 28(13.27%) on mono therapy were on stage 1 and stage 2 hypertensive blood pressure. 30(14.22%) of monotherapy was isolated systemic hypertension.

TABLE 3: COMPARISON OF PATIENT ON MONOTHERAPY AND DIFFERENT REGIMENS OF COMBINATION THERAPY DURING THE STUDY PERIOD IN BUTAJIRA ZONAL HOSPITAL FROM JAN.1 - DEC. 31, 2010

Blood pressure (mmHg)	Regimen			Total
	Mono-therapy	Combination therapy		
		2 drug	3 drug	
Pre-hypertensive	42(19.90%)	7(3.18%)	0(0%)	49(10.08%)
$Stage_1$	106(50.24%)	78(35.46%)	7(12.73%)	191(30.30%)
$Stage_2$	28(13.27%)	95(43.18%)	20(36.36%)	143(29.42%)
$\geq \frac{180}{110}$	5(2.37%)	27(12.27%)	28(50.91%)	60(12.35%)
ISH (SBP $\geq$ 160 DBP $\leq$ 95	30(14.22%)	13(5.91%)	0(0%)	43(8.85%)
Total	211(100%)	220(100%)	55(100%)	486(100%)

ISH-Isolated Systemic Hypertension, SBP-Systolic Blood Pressure, DBP-Diastolic Blood Pressure.

Out of 486 patients, regime change was recorded in 49(10.08%) patients. Among them 15(14.15%) and 11(9.24%) were between age 55-64 and 45-54 years respectively. The majority of regime change was above 45 years old.

TABLE 4: AGE AND REGIME CHANGE CROSS TABULATION IN BUTAJIRA ZONAL HOSPITAL FROM JAN.1 - DEC. 31, 2010

Age	Regime change		Total
	No	Yes	
<25	30(90.91%)	3(9.09%)	33(100%)
25 – 34	66(97.06%)	2(2.94%)	68(100%)
35 – 44	105(92.11%)	9(7.89%)	114(100%)
45 – 54	108(90.76%)	11(9.24%)	119(100%)
55 – 64	91(85.85%)	15(14.15%)	106(100%)
$\geq$ 65	37(80.44%)	9(19.56%)	46(100%)
Total	437(89.92%)	49(10.08%)	486(100%)

The common signs/symptoms and disease reported during diagnosis of disease were headache 31(19.50%), congestive heart failure 23(14.46%) and urinary tract infection 23(14.46%).

TABLE 5: THE COMMON SIGNS/SYMPTOMS AND DISEASE DURING THE STUDY PERIOD IN BUTAJIRA ZONAL HOSPITAL FROM JAN.1 - DEC. 31, 2010

Signs/symptoms and disease	Frequency	Percentage %
Headache	31	19.50
Congestive heart failure	23	14.46
Urinary tract infection	23	14.46
Peptic ulcer disease	17	10.70
Diabetes mellitus	13	8.19
Pneumonia	10	6.29
Epigastric pain	7	4.40
Joint pain	6	3.77
Asthma	6	3.77
Back pain	5	3.14
Malaria	5	3.14
Upper respiratory tract infection	4	2.52
Diarrhea	3	1.89
Others	6	3.77
Total	159	100

A total of 198 patients were taking other drugs concomitantly with anti-hypertensive drugs ASA 35(17.68%) from non-steroids anti-inflammatory drugs, norfloxacin 15(7.58%) from antibiotics, Digoxin 14(7.07%) from cardiovascular drugs, Insulin 9(4.55%) from anti diabetics and salbutamol6 (3.03%) from anti-asthma were commonly co administered with anti-hypertensives (**Table 6**).

TABLE 6: OTHER DRUGS TAKEN WITH ANTI-HYPERTENSIVE AGENTS DURING THE STUDY PERIOD IN BUTAJIRA ZONAL HOSPITAL FROM JAN.1 - DEC. 31, 2010

Drugs	Number	Total
Analgesics		
Asprin	35(17.68%)	
Ibuprofen	13 (6.56%)	
Diclofenac	12 (6.06%)	
Paractamol	10 (5.05%	74(37.37%)
Dyprone injection	2 (1.01%)	
Indomethacin	2 (1.01%)	
Antibiotics		
Norfloxalin	15(7.58%)	
Amoxacillin	12 (6.06%)	
Ciprofloxalin	10 (5.05%)	45 (22.73%)
Ceflraxone	5 (2.53%)	
Cotrimoxazole	3 (1.51%)	
Gastrio intestinal drugs		
Omeprazole	13 (6.56%)	
Cimitidine	9 (4.55%)	28 (14.14%)
Antacids	6 (3.03%)	
Cardio vascular drugs		
Digoxin	14(7.07%)	
KCl	2(101%)	16 (8.08%)
Anti diabetics		
Insulin	9(4.55%)	
Glibenclamide	4 (2.02%)	14(7.07%)
Metformin	1 (1.01%)	
Anti-asthma		
Salbutamol	6(3.03%)	10(5.05%)
Prednisolone	4(2.02%)	
Anti-protozoa		
Artemether + Lumefantrine	7(3.53%)	7(3.53%)
Others	4(2.02%)	4(2.02%)
Total	198(100%)	198(100%)

The drugs mentioned in **Table 7** were co prescribed drugs having drug-drug interaction with anti-hypertensive drugs were ASA 6(26.09%) and insulin 4(17.39%) were commonly prescribed.

TABLE 7: HARMFUL DRUG-DRUG INTERACTIONS WITH ANTIHYPERTENSIVE DRUGS DURING STUDY PERIOD IN BUTAJIRA HOSPITAL FROM JAN.1 - DEC. 31, 2010

Co-prescribed drugs	Anti-hypertensive	Number (%)
ASA	Enalapirl	6(26.09%)
Insulin	Hydrochlorothiazide	4(17.39%)
Glibenclamide	Hydrochlorothiazide	3(13.04%)
Prednisolone	Hydrochlorothiazide	3(13.04%)
Diclofenac	Captoprirl	3(13.04%)
Diclofenac	Enalapirl	2(8.70%)
Cimetidine	Nifiedipine	2(8.70%)
Total		23(100%)

DISCUSSION: Assessment of anti-hypertensive drugs utilization pattern is essential because of hypertension is the most common cardiovascular disease. The study showed that there were higher numbers of female patients (54.94%). This value is consistent with the value 55% found in Nigeria.[11] The possible causes for the higher number of hypertension of females were due to pregnancy induced hypertension, higher fat accumulation than men and high estrogen level is possible cause of hypertension.

The study showed that 58.29% of patients were using diuretics (hydrochlorothiazide), followed by calcium channel blockers (Nifidipine) 28.91%. In a research done in Nigeria thiazide diuretics alone or in combinations remained the most commonly prescribed drugs in 56% of all patients.[11] A study conducted in Ethiopia in patients with essential hypertension in Tikur Abnessa Hospital showed that hydrochlorothiazide significantly lowered both systolic and diastole blood pressure.[9]

The proportion of patients on combination therapy was (56.58%), according to recently issued international recommendations. One of the major reasons for the combinations of drugs is that, while reaching a superior clinical effectiveness, lower dose of both associated drugs can be used and this results in a lower incidence of adverse effects. In the present study 86.18% & 13.82% were on two and three drugs of combination therapy respectively and these results were better than similar to the research done in Nigeria, i.e., 61.2% and 33.6% were on 2 and 3 drugs, respectively.[12]

According to the result, regimen change was recorded in 10.08% of patients. The reasons for most of regimen changes were not written but some patients regimen change was due to side effects of the drugs and uncontrolled hypertension. According to study done in Netherlands, the percentage of non-compliant patients (compliance < 80%) among cases and controls was 5.1 and 3.6%, respectively which is associated with the occurrence of change in anti-hypertensive medication regimen.[13]

The study showed that the common co morbid disease during the diagnosis of hypertensive patients were congestive heart failure (14.46%), urinary tract infection (14.46%), peptic ulcer disease (10.7%) and diabetes mellitus (10.70%). But study done in Nigeria shows that type diabetes mellitus was most frequent co morbidity among hypertensive patients (32.7%), followed by Osteo arthritis (21.8%) and congestive heart failure (9.1%).[14]

In the present study, the prevalence of potentially harmful drug interaction patients was 4.7%. A study done in Tokyo on patients using Non-steroid anti-inflammatory drugs, the difference in the change in systolic blood pressure between the User and Non-user groups was 2.88 mmHg (95% confidence interval: 0.89, 4.87); thus, systolic blood pressure in the Non-User group decreased further from the baseline than that in the User group. In the subjects administered beta blockers, diuretics, angiotensin-converting enzyme inhibitors, and calcium channel blockers, the corresponding differences were 0.37 mmHg, 6.11 mmHg, 3.85 mmHg, and 3.50 mmHg respectively.[15]

The study showed that most of the prescribers are compliance to national standard treatment guidelines. According to Ethiopian standard treatment guidelines, hydrochlorothiazide, Nifedipine, Atenolol and enalapril were the first

step agents for non-emergency condition, whereas hydralazine and captopril in addition to furosemide were indicated for hypertensive emergency and hypertensive urgency respectively.[4]

CONCLUSION: Diuretics were the most prescribed anti-hypertensive drugs in mono-therapy and combination therapy, hydrochlorothiazide was the major one among diuretics. Majority of hypertensive patients were treated by combination therapy than mono-therapy. Majority of hypertensive patients were stage 1. Headache, congestive heart failure, urinary tract infection and peptic ulcer disease were common signs and diseases reported during diagnosis. NSAIDS, antibiotics, and Gastro-intestinal drugs were the common, concomitantly taken drugs with anti-hypertensive drugs. Most prescribers were compliance with standard treatment guideline. Aspirin and insulin were concomitantly taken with anti-hypertensive, yet having significant drug interaction.

CONFLICT OF INTEREST: The authors declare no conflict of interest.

REFERENCES:

1. Paul AJ, Suzanne O, Barry LC, William CC, Cheryl DH, Joel H, *et al*: Evidence-Based Guideline for the Management of High Blood Pressure in Adults. Report From the Panel Members Appointed to the Eighth Joint National Committee (JNC 8) FREE. *JAMA* 2014; 311(5):507-520. doi:10.1001/jama.2013.284427
2. Healthwise Staff. High Blood Pressure Treatment Guidelines. https://myhealth.alberta.ca/health/Pages/conditions.aspx?hwid=tx4349. Accessed in March 2010.
3. Raymond RT and Myron HW: Current concepts in hypertension: hypertension and renal disease. The American Society of Hypertension. 2001; 4(2): p.2
4. Drug administration and control authority of Ethiopia (DACA), Standard treatment guideline for primary hospital. 2010, Addis Ababa, Ethiopia; (106-113)
5. Fernando A. Epidemiological aspects of hypertension in the world, Geneva foundation for medical education and research 2008:2(1); 435-439
6. World Health Organization. World health report 2002. Reducing risks, promoting healthy life. *Geneva*: WHO, 2002. www.who.int/whr/2002/en/index.html (accessed 26 Sep 2005).
7. Kearney PM, Whelton M, Reynolds K, Whelton PK, He J. Worldwide prevalence of hypertension: a systematic review. J Hypertens. 2004 Jan;22(1):11-9.
8. Zaki NH, Mousa QH and Ghazi FH: Hypertension as a Risk Factor: Is It Different in Ischemic Stroke and AcuteMyocardial Infarction Comparative. International Journal of Hypertension 2011; Article ID 701029, 5 pages. doi:10.4061/2011/701029
9. Habte B: The efficacy of hydrochlorothiazide, timolol and enalapril in Ethiopians with essential hypertension. Ethiop Med J. 1992;30(3):163-7.
10. Giday A, Wolde M, Yihdego D: Hypertension, obesity and central obesity in diabetics and non-diabetics in Southern Ethiopia. Ethiopian Journal of Health Development 2010; 24(2)
11. Adigun AQ, Isholo DA, Akintomide AO, Ajay AAL: Shifting trends in the pharmacologic treatment of hypertension in a Nigerian tertiary hospital: a real-world evaluation of the efficacy, safety, rationality and pharmaco-economics of old and newer antihypertensive drugs. Journal of Human Hypertension 2003; 17:277–285. doi:10.1038/sj.jhh.1001538
12. Etuk E, Isezuo SA, Chika A, AkucheJ, Ali M: Prescription pattern of anti-hypertensive drugs in a tertiary health institution in Nigeria. Ann Afr Med 2008; 7:128-32.
13. Van Wijk BL, Klungel OH, Heerdink ER, de Boer A: The association between compliance with antihypertensive drugs and modification of anti-hypertensive drug regimen. J Hypertens. 2004, 22(9) 1831-7
14. Kazeem BY and Olumide B: Physician prescription of anti-hypertensive drug combinations in tertiary care setting in South Western Nigeria. J Pharm Pharmaceut Sci 2005; 8(2): 235-242.
15. Ishiguro C, Fujita T, Omori T, Fujii Y, Mayama T, Sato T: Assessing the effects of non-steroidal anti-inflammatory drugs on antihypertensive drug therapy using post-marketing surveillance database. J Epidemiol. 2008; 18(3):119-24.

How to cite this article:
Busser D, Yarlagadda R, Ahmed SM: Assessment of Antihypertensive Drugs Utilization Pattern in Butajira Zonal Hospital, Butajira Town, South Ethiopia. Int J Pharm Sci Res 2016; 7(10): 4028-34.doi: 10.13040/IJPSR.0975-8232.7(10).4028-34.

All © 2013 are reserved by International Journal of Pharmaceutical Sciences and Research. This Journal licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Unported License.

This article can be downloaded to **ANDROID OS** based mobile. Scan QR Code using Code/Bar Scanner from your mobile. (Scanners are available on Google Playstore)