ISSN:0975-1459
Journal of Pharmaceutical Sciences and Research
www.jpsr.pharmainfo.in

Rational Use of Beta Blockers in Management of Hypertension

Khawaja Tahir Mehmood, Fatima Amin, Hafiza Kiran Ismail, Ayesha Irfan.
Lahore College for women university Lahore, Pakistan

Abstract:
Hypertension is an extremely common disorder. It is major risk factor for cardiovascular morbidity and mortality through its effects on target organs like brain heart kidney eyes. In Pakistan magnitude of problem of uncontrolled hypertension is greater. .Treatment of hypertension decreases morbidity and increases life expectancy. . Beta blockers are widely used in the treatment of hypertension. Beta blockers are effective only when they are rationally prescribed and used. It is retrospective type of study during which data of 50 hypertensive patients with primary hypertension using beta blockers were collected to analyze whether beta blockers are rationally prescribed and used. After therapy with beta blockers Blood pressure is effectively controlled. After the therapy 20 % patient have B.P in range of 110-130, 56% patients have B.P in range of 120-130 and 24% have B.P in range of 130-140.It is concluded that blood pressure is effectively controlled when beta blockers rationally used. It should be given with caution in older and diabetic patients because it increases the risk of stroke in older patients. It is most effective when given in combination.

Key words; Beta blockers, Hypertension, rational use,

INTRODUCTION:

Hypertension is defined as either a sustained systolic blood pressure of greater than 140 mmHg or sustained diastolic blood pressure of greater than 90mmHg. High blood pressure also known as hypertension is usually defined as having a sustained blood pressure of 140/90 mmHg or above. Hypertension is defined as repeatedly elevated blood pressure exceeding 140/90mmHg. (1, 2, 3)

Seventh report of Joint National Committee classifies hypertension into four categories for the purpose of treatment and management. The categories are normal less than 120/80 , pre hypertension 120-139/80-89, stage 1 hypertension 140-159/90-99, stage 2 hypertension 160 and above/ 100 and above . (4)

Hypertension is basically of two types' primary hypertension and secondary hypertension. The vast majority of patients with hypertension about 90-95% have primary hypertension in which underlying cause is unknown. Secondary hypertension in which underlying cause is known affects a small percentage of patients. In these cases hypertension causes are known and medical. The medical reasons behind high blood pressure can be liver, kidney, or heart diseases. Apart from these two types other rare types include malignant hypertension, isolated systolic hypertension, white coat hypertension and resistant hypertension. (5, 6)

Although exact causes of primary hypertension is not fully understood it is known that some factors that contribute include smoking, obesity, alcohol consumption, lack of exercise. Secondary hypertension is caused by endocrine diseases, narrowing of aorta, may also be caused by steroids, medicines, pregnancy, contraceptive pills. A family history of hypertension increases likelihood that an individual will develop hypertension diseases. (7)

Hypertension or high blood pressure usually causes no symptoms and high blood pressure is often called as Silent Killer. People who have hypertension typically don't know it until their blood pressure is measured. Sometime people with markedly elevated blood pressure may develop headache, dizziness, blurred vision, nausea, vomiting, chest pain, shortness of breadth. In chronic high blood pressure commonly found organ damages are heart attack, heart failure, kidney failure, eye damage. (8) Typically hypertension attributed symptoms like dizziness and headache are more prevalent in hypertensives and are closely related to blood pressure levels in untreated and treated conditions. (9)

Hypertension is a major risk factor for cardiovascular morbidity and mortality through

its effects on target organs like brain, kidney, heart, and eye. Hypertension causes organ damage by direct physical effects of increase blood pressure as well as active promotion of atherosclerosis and thrombogenesis. Presence of target organ damage makes a dramatic difference to clinical outcomes in hypertension. The target organ effects of hypertension are particularly manifest in heart, brain, kidney, peripheral arteries and eyes. Hypertension is a progressive cardiovascular syndrome arising from complex and interrelated etiologies. Early markers of the syndrome are often present before blood pressure elevation is sustained. Progression is strongly associated with functional and structural cardiac and vascular abnormalities that damage the heart, kidneys, brain, vasculature, and other organs and lead to premature morbidity and death. (10)

Different diagnostic methods are used to detect high blood pressure. Blood pressure is usually measured by sphygmomanometer. Sphygmomanometer or blood pressure guage is an instrument which is used to measurement blood pressure and detection of hypertension. Diagnosis of hypertension is usually made after two or more readings after the first visit. The different methods used for diagnosis of hypertension includes Patient medical history, physical examination , electrocardiograph (ECG) , chest X-rays, blood and urine tests, electrocardiography (ultrasonic cardiography), magnetic resonance imaging (MRI), fast computerized tomography (CT), cholesterol and blood sugar levels. (11)

Treatment of hypertension is important because it is serious condition that can damage blood vessels and lead to serious conditions including heart attack, kidney failure, and vision problems. The management of hypertension involves pharmacological treatment as well as lifestyle modifications. The goal of antihypertensive therapy is to reduce cardiovascular and renal morbidity. The drugs used for treatment of hypertension includes thiazide diuretics, beta blockers, angiotensin converting enzyme inhibitors, calcium channel blockers, angiotensin receptor blockers, vasodilators .The sixth report of joint national committee on detection evaluation and treatment of hypertension recommends thiazide diuretics and beta blockers as first line agents for hypertension because of risk reductions in vascular morbidity and mortality. JNC 7 recommends thiazide diuretics for first line treatment of hypertension and recommends other drugs like beta blockers ACE inhibitors calcium channel blockers if thiazide diuretics are contraindicated. Beta blockers are recommended in JNC 7 report as first line therapy in patients with compelling indications such as ischemia, heart diseases and heart failure. (12)

Life style modifications play very important role in prevention and management of hypertension. Studies provide evidence that reduction in salt intake help in prevention and lowering of blood pressure. Increase physical activity and decrease alcohol intake are also very effective in reducing blood pressure. Some other interventions for reducing high blood pressure includes Stress management, use of pill supplementation to increase Potassium, fish oils, calcium and magnesium, dietary fibers, and change in fat ,fatty acids, carbohydrates and protein intake. (13)

Beta blockers are widely used in the treatment of hypertension .Beta blockers are still recommended as first line agents by guidelines. Beta blockers are recommended as first line therapy when indicated for example with heart failure. For more than 3 decades beta blockers have been widely used in the treatment of hypertension (14). National and international guidelines have promoted beta blockers as being on equal footing with thiazide diuretics, calcium channel blockers, renin –angiotensin-aldosterone system blockers, and angiotensin receptors blockers. (15)

The sixth report of joint national committee on detection evaluation and treatment of hypertension support diuretics and beta blockers as first line agents for hypertension because of proven reductions in morbidity and mortality. Most commonly used beta blockers are atenolol, metoprolol, nadolol, propanolol, timolol. Beta blockers are of two types selective and nonselective beta blockers.

Selective beta blockers specifically block beta 1 receptors. Nonselective beta blockers block both beta 1 and 2 receptors. Evidence suggests that lipophillic beta blockers relatively are best. Cardio selectivity appears to be advantage for risk reduction in smokers and also concerning side effects and quality of life. (16, 17)

Beta blockers are drugs that bind to beta adrenergic receptors but do not activate them thereby block the actions of beta adrenergic agonists. Beta blockers reduce blood pressure very effectively in both systolic and diastolic hypertension. Beta blockers antagonize the action of adrenaline and relieve stress to heart. Exact mechanism is not known but it has been proposed that beta blockers reduce blood pressure by reducing heart rate and cardiac output , inhibit release of rennin, inhibit sympathetic outflow, reduce venous return and plasma volume, produce nitric oxide, decrease vasomotor tone, improve vascular compliance and resetting baroreceptor level. Beta blockers oppose the excitatory effects of norepinephrine at beta adrenergic receptors. (18)

Beta-blockers are well tolerated in clinical practice, although they can have side effects that include fatigue, depression, impaired exercise tolerance, sexual dysfunction, and asthma attacks. Beta blocker causes adverse metabolic effects by causing unfavorable effects on lipids or by causing diabetes. Beta blockers cause weight gain in some patients. Obesity management in overweight hypertensive patient is more difficult in case of beta blocker use. (19)

The risk of stroke is higher with beta blockers than with other antihypertensive drugs and also specifically with atenolol. In primary hypertension beta blockers appear to offer no or less advantage in preventing death and preventing stroke. (20)

Beta blockers are not very effective for blood pressure reduction in elderly. Beta blocker should no longer be considered as appropriate first line therapy for uncomplicated hypertension in elderly. In trials comparing other antihypertensive medications with beta blockers all agents showed similar efficacy in younger patients while in older patients beta blockers were associated with high risk of stroke. Beta blockers appear to be less effective in reducing cardiovascular outcomes than thiazide diuretics particularly in older individuals. (21, 22, 23)

Beta blockers are not effective for blood pressure reduction in treating hypertension in blacks as they are in whites. The effectiveness of beta blockers can be increased by adding thiazide diuretics. (30)

Recently questions have been raised regarding the safety and effectiveness of beta blockers. The weaknesses identified include the adverse effects of older beta blockers on glucose control and stroke protection especially in elderly. But the evidences suggest that beta blockers are effective and safe antihypertensive drugs and should still be recommended as first line therapy in most uncomplicated hypertensive patients either alone or in combination with other drugs . There is reservation regarding their administration to diabetic and older hypertensive patients. However when compelling indications for their use exist they should not be withheld. (24, 25)

MATERIAL AND METHODS:

Data of 50 hypertensive patients collected who come to hospital and hypertensive patients in surroundings using beta blockers as antihypertensive therapy. Patients with primary hypertension were included in this group. During the study questionnaire was developed and data collected. Questions related to medicine used life style modifications, duration of therapy , family history, were include in order to analyze whether beta blockers as antihypertensive medications are working effectively in controlling blood pressure and effectively prescribed and used or not. Blood pressure of hypertensive patients was monitored for 4 weeks.

RESULTS AND DISCUSSION:

Hypertension is the medical term for high blood pressure and it is extremely common disorder. Hypertension is called silent killer because it usually causes no symptoms. More than 90% of people with hypertension have

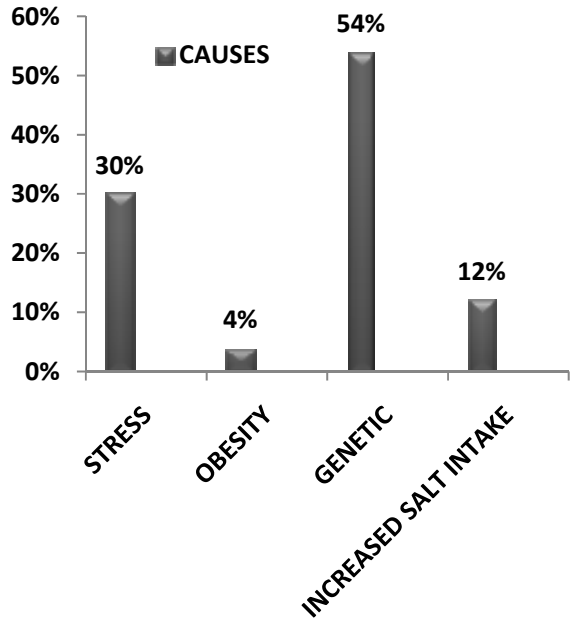
primary hypertension. Treatment of hypertension is very important because if it remains untreated it lead to life threatening complications. Beta blockers are widely used in the treatment of hypertension. Beta blockers are used either alone or in combination. Beta blockers effectively lower blood pressure when appropriately prescribed and administered especially in hypertensive patients with co morbid conditions. These are more effective when given in combination.

This study was conducted to see whether beta blockers are rationally prescribed or not. Following results were obtained.

People know very little about hypertension as 44% people know what is hypertension and 56% have no knowledge about it. Mostly people know about their hypertension in emergency case as data shows people know about their hypertension 52% in emergency service, 24% in routine medical check up and 16% in screening program.

52% people have hypertension for less than 5 years. 26% have more than 5 years and 10% have from more than 10 years. 54 % people have family history of hypertension. Among the causes is 54% genetic, 30% stress, 12% salt intake, 4% obesity.

CAUSES:



Most of the people as data show 44% check their B.P monthly. So there is need to increase awareness among patients about regular check up of blood pressure.

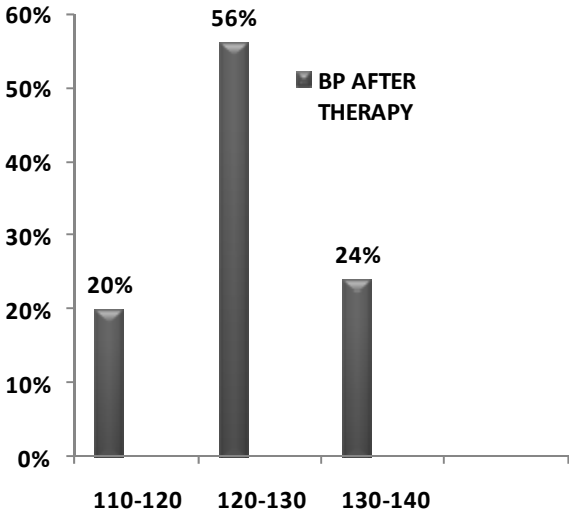
Majority about 64% go to hospital for follow up and minority about 2 % go to pharmacy.

20% people are hospitalized due to hypertension. Mostly about 54% initial treatment of hypertension is started with pharmacological treatment. 76 % people use medicine to treat hypertension and 24% do not use medicine. There is need to guide the patient about regular use of medicine and inform the patient about risks associated with hypertension if left untreated.

Among the mostly followed recommendation is salt restriction about 70% and less is weight and stress reduction. There is need to counsel the patient about importance of stress and weight reduction in lowering blood pressure.

The frequency of different beta blocker use is Atenolol 48%, Propranolol 34%, and Metoprolol 18%. After the treatment B.P of most patients lie in the range of 120-130.

BP RANGE AFTER THERAPY:



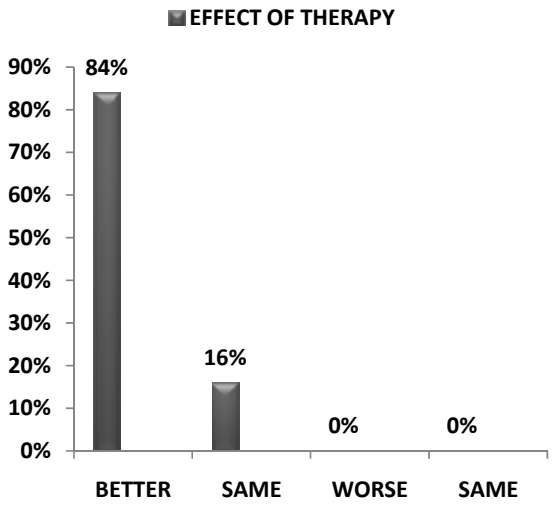
Beta blockers are very effective in controlling blood pressure in hypertensive patients. Beta blockers are mostly used as first line antihypertensive therapy. Beta blockers should not be used as first line therapy in diabetics and elder people. In treatment of primary

hypertension noncardioselective beta blockers should be preferred over cardiooselective.

Along with beta blockers lifestyle modifications should be adopted that will help in controlling blood pressure. Patients using beta blockers should be counseled about how to take beta blocker and at what time to take and not miss dose and what to do if side effects occurred. Patients using beta blockers should be informed about side effects like weight gain diabetes and headache. Only 10% people know about the side effects of beta blockers. In people having other diseases with hypertension 8% diseases occurred before the use of drugs and only 2 % occur after the use of beta blockers.

About 19 % patients missed their doses. In 84% patients after the use of beta blockers blood pressure is effectively controlled. About 94% patients are satisfied with beta blocker therapy for hypertension.

EFFECT OF THERAPY:



Mostly about 86% consult with physician and only 4% consult with pharmacist. There is need to increase the awareness about the role of pharmacist in controlling blood pressure. Pharmacist in most of the time is in direct contact with the patient and has greater opportunity to counsel the patient about treatment and management of hypertension.

In the light of the work done we have come to conclusion that there is need to increase awareness about hypertension and its complications in people as the people know very little about this disease. Most people know about their hypertension in emergency cases. People don't take it seriously and do not use medicine regularly and don't check blood pressure regularly. Along pharmacological treatment lifestyle modification is necessary to control blood pressure. Beta blockers are among the best class of anti hypertensive therapy when they are rationally used. Beta blockers effectively lower blood pressure when patient use it regularly at right time in right dose. Beta blockers are most effective when given in combination. Beta blockers should be used with caution in elderly and diabetics because in elderly it can cause stroke. There is need to tell the patient about side effects of beta blockers like weight gain, diabetes, and headache. There is need to counsel the patient about regular use of medicine and regular blood pressure checking. There involvement of pharmacist in hypertension management is very less and there is need to increase the involvement of pharmacist because pharmacist most effectively counsels the patient about proper use of medicine and importance of lifestyle modification in management of hypertension.

CONCLUSION

In the light of the work done we have come to conclusion that there is need to increase awareness about hypertension and its complications in people as the people know very little about this disease. Most people know about their hypertension in emergency cases. People don't take it seriously and do not use medicine regularly and don't check blood pressure regularly. Along pharmacological treatment lifestyle modification is necessary to control blood pressure. Beta blockers are among the best class of anti hypertensive therapy when they are rationally used. Beta blockers effectively lower blood pressure when patient use it regularly at right time in right dose. Beta blockers are most effective when

given in combination. Beta blockers should be used with caution in elderly and diabetics because in elderly it can cause stroke. There is need to tell the patient about side effects of beta blockers like weight gain, diabetes, and headache. There is need to counsel the patient about regular use of medicine and regular blood pressure checking. There involvement of pharmacist in hypertension management is very less and there is need to increase the involvement of pharmacist because pharmacist most effectively counsels the patient about proper use of medicine and importance of lifestyle modification in management of hypertension.

ACKNOWLEDGEMENT

We are very grateful to Dr. Bushra Mateen, Vice Chancellor, Lahore College for Women University Lahore,Dr. Hafeez, Head of Pharmacy Department, Lahore College for Women University and to Dr Afshan of sir Ganga Ram hospital.

REFERENCES

[1]. Lippincots illustrated review pharmacology 3rd edition by Richard D Howland 2006
[2]. Blood pressure NHS choices your health 2006
[3]. www.medterm.com visited on 22 may 2010
[4]. Reasons for high blood pressure by Joe Tailor
[5]. Cardiovascular drugs Anna M Wodlinger Remington 21st edition volume2
[6]. Reasons for high blood pressure by Joe Tailor www.hypertension.blood pressure.centre.com
[7]. The British Union Provident association bupa.co.wk Dr. james Quekett
[8]. www.emedicine health. Com
[9]. Journal of human hypertension 2008, 252-258 prevalence of hypertension attributed symptoms
[10]. Article by Kona Vishnu medical writer Omni medical search
[11]. Eduardo Piamet Fixed combination in management of hypertension department of hypertension and neurology hypertension program university of Albama and Brimingham USA 2008
[12]. Ron Walls Diuretics and beta blockers still first choice for hypertension Journal watch emergency medicine (1998)
[13]. Gregory Y.H. Lip Target organ damage and prothrombic state in hypertension (2000) American Heart association
[14]. Spiral et al Cardiovascular protection using beta blockers a critical review of evidence (2007)
[15]. Christopher P .John Beta blockers have same efficacy as other antihypertensive (2007)
[16]. Wikstrand john Primary prevention with beta blockers in patient with hypertension (1990)
[17]. Ron Walls Diuretic and beta blocker still first choice for hypertension Journal watch emergency medicine
[18]. Beat J Meyer Rethinking role of beta blockers in hypertension Journal watch of cardiology (2005)
[19]. Franz et al Are beta blockers efficacious as first line therapy in elderly JAMA (1998)
[20]. Khan and McAlister (2006) beta blockers in elderly
[21]. Jenny et al Blood pressure lowering efficacy of beta blocker as second line agent Cochrane hypertension group (2009)
[22]. Cruickshant et al Beta blockers in black patients
[23]. Arya M Sharma et al Beta blockers and weight gain American heart association (2001)
[24]. Beat J Meyer Rethinking role of beta blockers in hypertension Journal watch of cardiology (2005)
[25]. Domenic A .Sica New vasodilating beta blockers in hypertension (2008)