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Research article

ADVERSE EFFECTS OF BETA BLOCKERS AMONG HYPERTENSIVE PATIENTS

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ABSTRACT

Hypertension is the most common life style disease affecting the majority of the adult population in the world. According to Joint National Committee 7, systolic pressure140 and diastolic pressure 90 mmHg and above is considered as hypertension. Currently there are numerous drug regimens for hypertension are available of which some drugs may also be associated with adverse effects and since beta blockers are the most affordable and commonly used drugs in the treatment, the assessment of the adverse effects of beta blockers occurring in hypertensive patients is mandatory. The study was done as a hospital based cross sectional study in which 74 patients were selected randomly after getting the informed consent. Among 74 participants, 52 (70%) were females and 22 (30%) were males. The commonly encountered adverse effects were tiredness, giddiness and shortness of breath. The other adverse effects includes, headache, blurred vision, tremor, decreased alertness, weight gain, etc., also been reported. All these are effects are due to the pharmacological actions of beta blockers. On comparison between two age groups, 51-60 (elderly hypertensive patients) experienced more adverse effects than the younger age group. Similarly in our study, females developed more adverse effects than males and also more in higher age group especially giddiness, tiredness and shortness of breath. In this study the adverse effects were more common among elderly age group females which indicate that this group of women may require some alternative drug regimen or beta blockers can be prescribed along with other anti hypertensive drugs. Thus beta blockers should not be the first line therapy in the treatment of hypertension. Further in depth research involving more sample and various age groups of study population might explore the actual picture on the burden of adverse effects of beta-blockers.

Key words: Beta-blockers, Adverse effects, Hypertensive, Giddiness, Shortness of breath, headache, weight gain, decreased alertness.

INTRODUCTION

Hypertension is a common life style disease affecting the human population. It is also a hereditary disease. According to Joint National Committee 7(JNC 7), systolic pressure above 140mm Hg and diastolic pressure above 90 mm Hg is considered as hypertension. Prevalence of Hypertension has increased due to obesity, changes in diet, stress[1]. There are various type of antihypertensive drugs such as beta blockers, diuretics, calcium channel blockers, ACE inhibitors, alpha blockers, etc[2]., The most commonly used one is beta blockers, as these are the cheapest and easily available ones. Beta blockers (beta adrenergic blockers, beta antagonist) are the class of drugs targeting the beta adrenergic receptors. They differ in their effects on adrenergic receptors and duration of action. Three types of beta - adrenergic receptors with different kind of drugs act on different receptors. Beta 1 receptor also known as cardio-selective found mainly in the heart & kidney. Beta 2, also known as non-cardio selective is found in the liver, lungs, GIT, uterus, etc.,[3]. Beta blockers inhibit the chronotropic, inotropic and vasoconstrictor response to the Catecholamines like Norepinephrine & epinephrine. Atenolol is a hydrophilic 3-adrenoceptor blocker with a half-life of about 6-10 hr while metoprolol, the more lipophilic compound, has a half-life of about 3-4 hrs. Most beta blockers have half life over 8 hours[4]. They are metabolized in combination by liver and kidney. Atenolol is primarily metabolized by kidney while liver has little or no involvement. Beta blockers are used for the management of hypertension, cardiac arrhythmia, glaucoma, angina, coronary artery disease etc. To the best of the knowledge of the investigators and after extensive literature review, very few studies were done in India in relation to the adverse effects of beta blockers. Hence this study was planned, in order to assess the in depth self perceptive adverse effects of beta blockers among hypertensive patients on treatment.

AIMS & OBJECTIVES:

The aims of this study were

1. Assessment of the common side effects occurring in hypertensive patients who are chronic users of beta blockers.
2. To compare the gender and age difference in relation to the tolerance of beta blockers during the treatment for hypertension
3. Promoting awareness to the community about the common side effects occurring after the consumption of beta blockers

MATERIALS AND METHODS

The study was done as a hospital based cross sectional study among adult hypertensive population of both genders between 40 to 60 years attending general medicine OPD from July and August 2013 using a pre formed pretested questionnaire after getting the informed consent. The study participants were selected by simple random sampling method among those who attended the OPD clinic after applying inclusion and exclusion criteria. The participants were informed about the purpose of the study and confidentiality.

Inclusion criteria: Known hypertension patients on beta blocker for treatment of hypertension for at least one year and above with 40 to 60 years of age

Exclusion Criteria: Patients with other chronic medical conditions and co – morbidities like Diabetes mellitus, Cardio vascular diseases, chronic lung disease, cardiac failure, Kidney

diseases, liver diseases and who are on any other drugs for treatment of chronic medical illnesses, patients allergic to certain drugs were excluded from the study.
After the participants gave consent for the study, they were interviewed using the questionnaire by the investigator at the OPD in a separate room. The questionnaire included general socio-demographic profile, complete treatment history, adverse effects perceived by them during the drug intake.
Data collection: Questionnaire method with personal interview
Data entry and Analysis:
The data were entered in MS excel spread sheet and analysis was done using SPSS software. The data were represented in Tabular form and appropriate charts and diagrams were used.

RESULTS

SOCIO DEMOGRAPHIC DETAILS

A total of 74 participants with 41 to 60 years of age group were interviewed during this period, of which 52 (70%) were males and 22 (30%) were females. Majority 76% of the study population belonged to 51 to 60 years of age group and the remaining were from 41 to 50 years. Mean age of the study participants was 54.3 years and the mean duration of treatment for hypertension was 7.14 years. Sixty percent (44) of the study participants were known hypertensives for 5 to 10 years of duration. Among males approximately 20% of them had history of smoking and alcoholism. (Table – 1)

TREATMENT BEHAVIOUR AND ADVERSE EFFECTS PERCEIVED

Majority 70 (95%) of the study participants were on treatment with Atenolol whereas only remaining 5% (4) were on Metoprolol. The adverse effects reported by the participants were nausea, vomiting, skin rashes, weight loss/gain, hair loss, decreased alertness, palpitation, tremor and disturbed sleep wakeful cycle. Most common adverse effects reported were tiredness (91%), giddiness (85%), and shortness of breath (80%), headache (62%), blurring of vision (61%), altered sleep wakeful cycle (57%), and excessive sweating (53%). (Table – 2)The least common adverse effects were nausea, vomiting, skin rash and hair loss. Approximately 30% of the participants reported decreased alertness and 41% perceived palpitation after consuming the drugs. Our study also explored that the adverse effects were more common among females than males and also more commonly reported by higher age group (51 to 60) than lower age group (41 to 50). (Table – 3) Among females most of them reported giddiness, tiredness and shortness of breath compared to males, and there is no such significant difference among two different age groups.

MISCELLANEOUS SYMPTOMS (ADVERSE EFFECTS)

Other symptoms perceived and reported by the participants were burning micturition, constipation, dry cough, dysphagia, heart burn, arthralgia, myalgia and increased frequency of defecation. Among these symptoms, majority reported arthralgia (16.3%), followed by burning micturition (6.8%). (Table – 4)

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TABLE -1 FREQUENCY DISTRIBUTION TABLE FOR SOCIO DEMOGRAPHIC PROFILE OF THE STUDY PARTICIPANTS

VARIABLE	NUMBER (N = 74)	PERCENTAGE
AGE GROUP		
41 TO 50	18	24%
51 TO 60	56	76%
GENDER		
MALE	22	30%
FEMALE	52	70%
OCCUPATION		
EMPLOYED	25	34%
UNEMPLOYED	49	66%
SOCIO ECONOMIC STATUS		
UPPER MIDDLE	61	82.5%
LOWER MIDDLE	13	17.5%
DURATION OF TREATMENT		
LESS THAN 5 YEARS	24	32%
5 TO 10 YEARS	44	60%
MORE THAN 10 YEARS	06	08%
BETA BLOCKERS TAKEN FOR TREATMENT		
ATENOLOL	70	95%
METOPROLOL	04	05%
LIFESTYLE HABITS		
SMOKER	04	05%
SMOKER AND ALCOHOLIC	08	11%
ALCOHOLIC	03	04%
NOT A SMOKER OR ALCOHOLIC	59	80%

TABLE – 2 ADVERSE EFFECTS OF BETA BLOCKERS PERCEIVED BY THE STUDY PARTICIPANTS

ADVERSE EFFECTS	NUMBER	PERCENTAGE (%)
NAUSEA/VOMITING	11	15%
WEIGHT GAIN	12	16%
SKIN RASHES	13	18%
HAIR LOSS	15	20%
↓↓ ALERTNESS	22	30%
PALPITATION	30	41%
TREMOR	33	45%
LOSS OF APPETITE	34	46%
PROFUSE SWEATING	39	53%
SLEEP WAKE CYCLE	42	57%
BLURRED VISION	45	61%
HEADACHE	46	62%
SHORTNESS OF BREATH	59	80%
GIDDINESS	63	85%
TIREDNESS	67	91%
MENSTRUAL DISTURBANCE	4	05%

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TABLE – 3 AGE AND SEX GROUP DISTRIBUTION OF ADVERSE EFFECTS DUE TO BETA BLOCKERS

ADVERSE EFFECTS	AGE GROUP			
	41 to 50 years		51 to 60 years	
	Male	Female	Male	Female
Skin rashes	1	0	4	8
Nausea and Vomiting	0	0	8	3
Headache	0	6	14	26
Loss of appetite	0	6	12	16
Weight gain/loss	0	6	6	12
Blurred vision	0	10	15	20
Shortness of breath	0	16	18	25
Hair loss	0	6	4	5
Tiredness	0	16	18	33
Profuse sweating	0	11	8	20
Giddiness	0	16	17	32
Palpitation	0	10	8	12
Tremor	0	7	6	20
Disturbed Sleep wakeful cycle	0	11	12	19
Decreased alertness	0	9	6	7

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TABLE – 4 MISCELLANEOUS SYMPTOMS / ADVERSE EFFECTS PERCEIVED BY THE STUDY PARTICIPANTS

SYMPTOM / ADVERSE EFFECTS	NUMBER	PERCENTAGE
BACK ACHE	4	5.4%
BURNING MICTRUTION	2	2.7%
BURNING MICTURITION	3	4.1%
CHEST BURN	1	1.4%
CONSTIPATION	2	2.7%
DRY COUGH	1	1.4%
DYSPHAGIA	1	1.4%
FREQUENT STOOLS	3	4.1%
GASTRITIS	2	2.7%
INDIGESTION	1	1.4%
JOINT ACHE/KNEE PAIN	5	6.8%
MUSCLE PAIN	1	1.4%
NERVE PAIN	1	1.4%
PRICKING PAIN IN JONTS	7	9.5%
PRICKING SENSATION IN THE FOOT	1	1.4%
SCALP IRRITATION	1	1.4%

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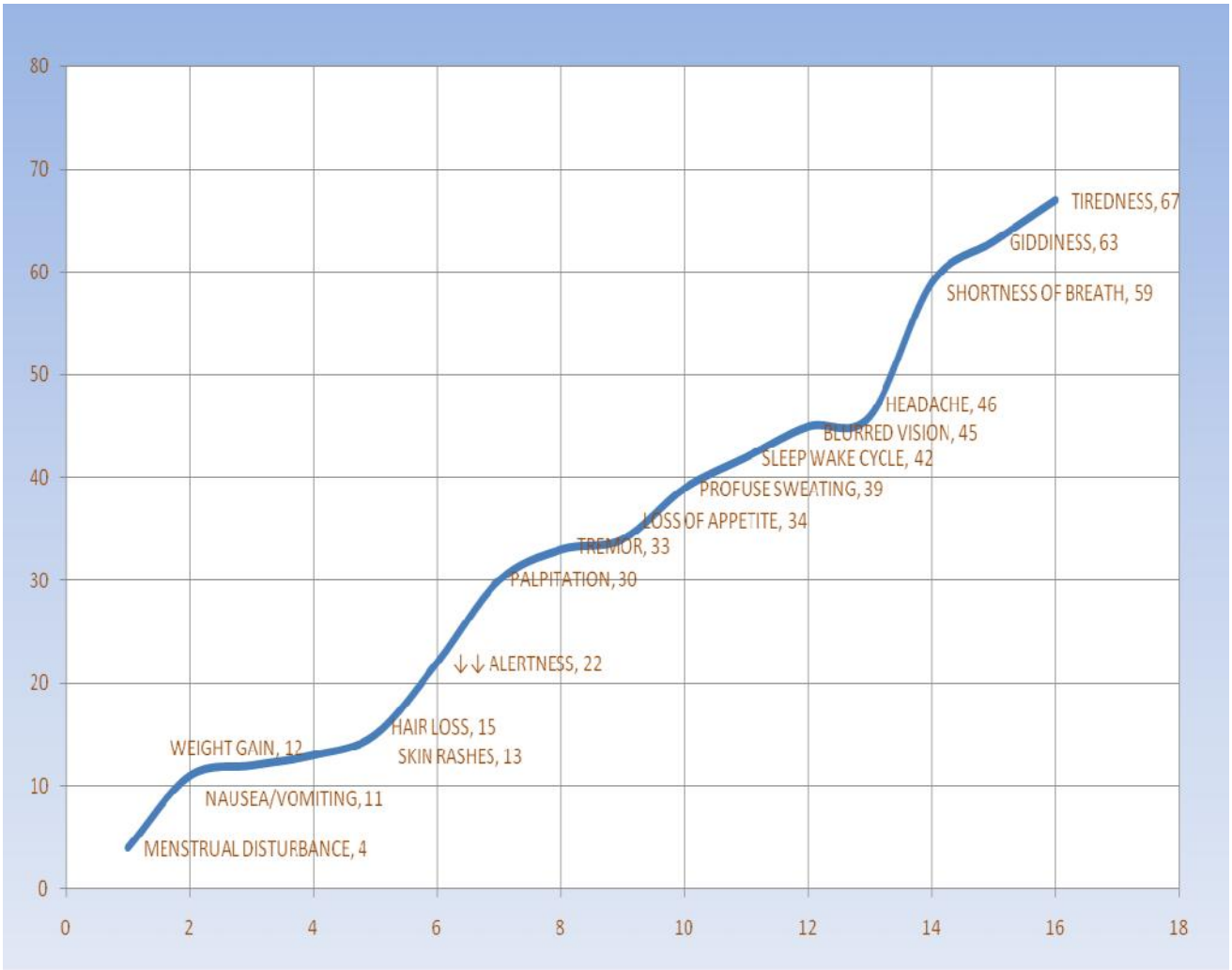
FIGURE – 1 TREND OF OTHER ADVERSE EFFECTS AMONG THE STUDY PARTICIPANTS



DISCUSSION

Anti hypertensive tablets are necessary to control the blood pressure within the normal limits. Various anti hypertensives are available such as beta -blockers, ACE inhibitors, Calcium channel blockers, alpha blockers, etc., In the present study, 74 patients in which 22 males and 52 females were participated. (Table – 1) of which most of them chronic hypertensives with a mean years of duration was 7.14 which suggests more the duration of exposure to drugs more will be the chances of adverse effects. A study carried out in south India by Ramesh et al., observed that 0.7% hospital admissions were due to adverse drug reactions and a total of 3.7% of hospitalized patients experience adverse drug reaction, of which1.3%are fatal[5]. But in this study there were no serious adverse effects except few patients (18%) developed skin rashes. The study published in the European Journal reported that certain beta blockers causes headache, musculocutaneous reaction, allergy, weight gain[6], and

depression, erectile dysfunctions[7]. The participants of the present study, experienced headache(62%), skin rashes (18%) weight gain (16%), decreased alertness (30%) but none of the participant suffered sexual dysfunction. Similarly a study done by Doumas M et al[8], reported that beta blockers have associated with the risk of sexual dysfunctions. Even though beta blockers are the prophylaxis for migraine, 62% patients have developed headache in this study. Significant number of participants in our study reported palpitation and tremor, which is unlikely in beta blockers can be attributed to anxiety. P.E.Hall et al[9], conducted a study in which 1500 patients using beta blockers were included and the incidence of fatigue was 1.2 %. In contrast our study had explored that tiredness (fatigue) was the most common adverse effect constituting 91%. According to the pharmacological action of beta blockers, patients treated with beta blockers have bradycardia, but surprisingly subjects under this study experienced palpitation. Beevers et al[10] in his meta analysis concluded that 'Beta blockers can also be dangerous in many hypertensive patients. Messerli FH and others proved that the beta blockers should not be the first line therapy for elderly hypertensives[11]. The present study also agrees with the above two statements. The study published in American Journal of hypertension[12] reported that diuretics and calcium-blocking drugs are more effective in elderly patients at lowering SBP pressure, beta- blockers were relatively ineffective, were frequently contraindicated, and had more side effects. This study also agrees with the above statement that the elderly hypertensives were easily more prone to get the adverse effects and in addition to this most of the other complaints like, burning micturition, heart burn, arthralgia etc., had been reported by them. Since hypertension is the life style disease some of the adverse effects may also be due to their stress, obesity decreased physical activity. However this can be prevented by advising the patients to do the regular physical exercises, yoga & to avoid the junk foods and to follow prudent diet principles to prevent them getting further complications.

CONCLUSION:

a)The common adverse effects seen in chronic hypertensive patients who were using beta blockers are tiredness, giddiness and shortness of breath b)Beta blockers are not suitable for elderly patients who are above 51 yrs & can be given to the middle aged persons as the second line of treatment for hypertension along with other anti hypertensive tablets.

LIMITATIONS:

Lesser sample size and self perception by the patients on adverse effects to the drugs without monitoring could be a limitation and cause of concern on overestimate of certain side effects of the drugs. Similarly adverse effects of variety of beta blockers could not be studied because most commonly used drugs were atenolol and metoprolol.

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