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RESEARCH ARTICLE

PHARMACOECONOMIC ANALYSIS OF ANTIHYPERTENSIVE DRUGS AND EVALUATION OF QUALITY OF LIFE, AN OBSERVATIONAL STUDY IN PATIENTS WITH HYPERTENSION, GGH, ANANTAPURAMU

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ABSTRACT

Introduction: Hypertension is one of the leading cause of global burden of disease and as it is a chronic condition with significant detrimental effects on the wide range of health outcomes, cost effective management of hypertension a appears to be a great challenge for both developed as well as developing countries eventhough recently there have been lot of studies on pharmaco- economics and out come research in the field of hypertension globally, but the results cannot be exactly extrapolated to Indian scenario as the economic status and socio economics factors are different in India as compared to the countries. Hence a study was undertaken to evaluate the cost effectiveness of antihypertensive drugs in our hospital. **Objectives:** To evaluate the prescription pattern, cost effective antihypertensive therapy and quality of (QoL) of the patients. **Materials and Methods:** An observational comparative study is planned on 100 patients Attending the outpatient Department of General medicine at GGH, Ananthapuramu from JUNE 2018 to DECEMBER 2018 with a follow up period of 6 months. Written informed consent is obtained from all the patients satisfying the inclusion criteria. In first visit, a detailed history is taken regarding the disease (hypertension) duration, co morbid condition, socio economic status, duration of antihypertensive therapy. Blood pressure and pulse is recorded, drug therapy details noted like pattern (monotherapy or multi drug therapy), costs of the drugs, dosage of the drug and changes in the drug therapy. After 6 months, again same details are collected. The details so obtained regarding the different patterns of drug therapy are analysed for the cost effectiveness. Statistical tests used for analysis are Chi square Test and "T" test. The QoL is evaluated with SF – 30 questionnaire. **Results:** Multitherapy was frequently prescribed (74%), out of that Atenolol with amlodipine. combination was most common (54%) , Diabetes was the most common co- morbid condition (24%). In mono therapy Amlodipine proved to be more cost effective (CER of 8.93) then Atenolol (CER 18.15) (p-0.0059) and in multitherapy Amlodipine with Enalapril combination was more cost effective *CER 18.24) then Amlodipine with Atenolol (CER 27.73) with (p-0.057). Conclusion: Multitherapy was most frequently prescribed, and Amlodipine with Enalapril combination proved to be most cost effective therapy. HRQoL was not much different in all the treatment groups.

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INTRODUCTION

Hypertension and its associated clinical conditions, in particular cardiovascular disease, place a great socioeconomic burden on the society [Elliott, 2003] Global burden of disease study reported that in 1990 there were 5.2 million deaths from cardiovascular diseases in economically developed countries and 9.1 million deaths from the same causes in developing countries [Gupta, 2014; Murray, 1997] Cardiovascular diseases caused about 2.3 million deaths in India in the year 1990 and are projected to double by the year 2020 [Elliott, 2003; Redwood, 2007]. Persistent hypertension is one of the risk factors for stroke, myocardial infarction, failure and arterial aneurysm, and is a leading cause of chronic kidney failure [Pierdomenico *et al.,* 2009]. While expenditures for hypertension are on the increase in developed countries, and potentially also in the developing world, resource constraints, even in the most affluent countries, need to consider hypertension control in the context of other demands of society. The population and the high-risk approach to hypertension control also have economic consequences; these may vary in different societies and need to be assessed to ensure appropriate allocation of resources. Pharmacoeconomic studies weigh the cost of alternative drugs and drug regimens against the outcomes they achieve to guide decisions [Arenas-Guzman, 2005; Surendra *et al.,* 2009; Walley, 1995; Fletcher,

1994]. Hence, it is very much necessary to assess the effective therapy and costs of the available intervention strategies to reduce the risks. The purpose of this study is to evaluate the effects and pharmacoeconomics of antihypertensive drugs prescribed in a Tertiary care hospital.

MATERIALS AND METHODS

An observational comparative study is planned on 100 patients Attending the outpatient Department of General medicine, GGH, Ananthapuramu from June 2018 to December 2018 with a follow up period of 6 months. Written informed consent is obtained from all the patients satisfying the inclusion criteria. In first visit, a detailed history is taken regarding the disease (hypertension) duration, co morbid condition, socio economic status, duration of antihypertensive therapy. Blood pressure and pulse is recorded, drug therapy details noted like pattern (monotherapy or multi drug therapy), costs of the drugs, dosage of the drug and changes in the drug therapy. After 6 months, again same details are collected. The details so obtained regarding the different patterns of drug therapy are analysed for the cost effectiveness. Statistical tests used for analysis are Chi square Test and "T" test. The QoL is evaluated with SF – 36 questionnaire.

Inclusion Criteria

- Patients aged › more than 35years.
- Both male and female
- Patients with comorbidity like diabetes, Hypothyroidism, Coronary artery disease, and Myocardial infarction.
- Patients with any grade of hypertension
- Patients with or without complications of Hypertension.

Exclusion Criteria

- Pregnant women and lactating mother.
- Patients with psychiatric disorders.
- Patients with co morbidity such as renal transplant.

RESULTS

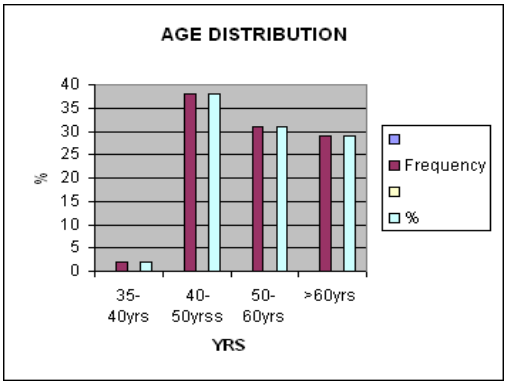
The present study was conducted in the Department of General Medicine in collaboration with the Department of Pharmacology, which included 100 patients with an objective of analyzing the prescription pattern of antihypertensive drugs and to evaluate the cost effective treatment among the prescriptions. After statistical analysis following results were obtained.

Age Distribution

Out of 100 patients,38% were in the age group of 40-50yrs,31%in 50-60yr,29% were above 60%yrs and only 2% were in the range of 35-40yrs.

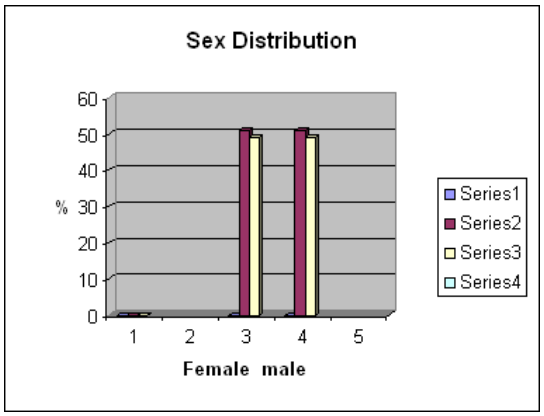
Table 01. Age Distribution

Age Distribution		
Age group	Frequency	%
35-40 yrs	2	2
40-50 yrs	38	38
50-60 yrs	31	31
>60 yrs	29	29
Total	100	100
Mean +or- SD		55.17 + or - 10.3



Sex Distribution

Sex	Frequency	%
Female	51	51
Male	49	49
Total	100	100



Stage of hypertension

Out of 100 patients,49% patients were in the stage of prehypertension, 45% were in stage 1 hypertension 4% were in stage 2 and 2%werein stage 3 hypertension.

Stages of hypertension

Table 03. Stages of Hypertension

Hypertension	Frequency	%
Prehypertension	49	46
Stage 1 HTN	45	45
Stage 2 HTN	4	4
Stage 3 HTN	2	2
Total	100	100

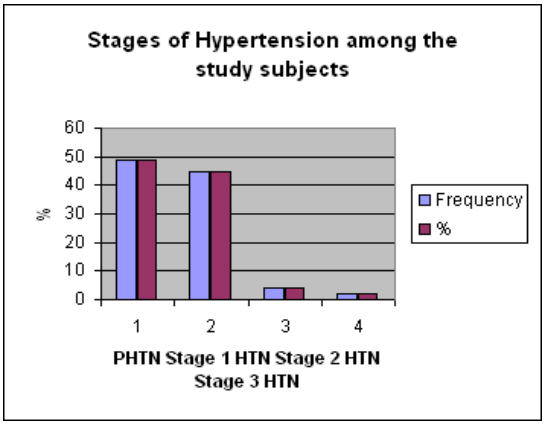


Fig 03. Stage of Hypertension

Duration of Hypertension

Out of 100 patients,76% patients had hypertension since 6-10yrs, 16% since 11-15yrs, 5% since 0-5yrs and only 3% had it since last 16-20 yrs. With the mean duration of 8.67 + or – 2.89yrs.

Duration of hypertension among the study subjects

Table 04. Duration of Hypertension

Duration	Frequency	%
0-5yrs	5	5
6-10yrs	76	76
11-15yrs	16	16
16-20yrs	3	3
Total	100	100
Mean + or - SD		8.86 +or- 2.89

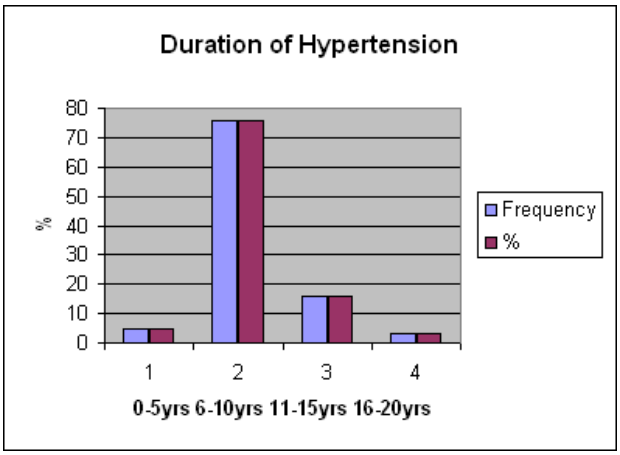


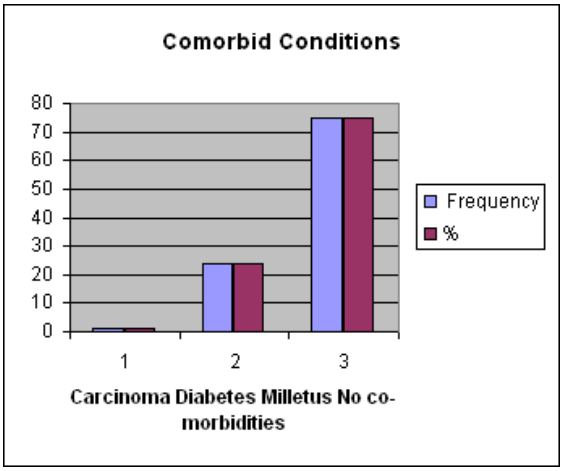
Fig 04. Duration of Hypertension

Comorbid Conditions

Out of 100 patients,75%patients did not have any co-morbid condition along with hypertension, 24% had Diabetes mellitus(DM), and only 1% patient had cancer.

Comorbid Condintions

Co-morbidity	Frequency	%
Carcinoma	1	1
Diabetes Mellitus	24	24
No co-morbidities	75	75
Total	100	100



Complications associated with hypertension

Out of 100 patients,92% patients did not have any complications associated with hypertension, 5% patients had IHD (ischemic heart disease), 2% had CVE (cerebrovascular events like stroke), and 1% had LVF (left ventricular failure).

Complications among the study subjects

Table 06. Complications

Complications	Frequency	%
Cerebrovascular events	2	2
Ischemic Heart Disease	5	5
Left Ventricular failure	1	1
No complications	92	92
Total	100	100

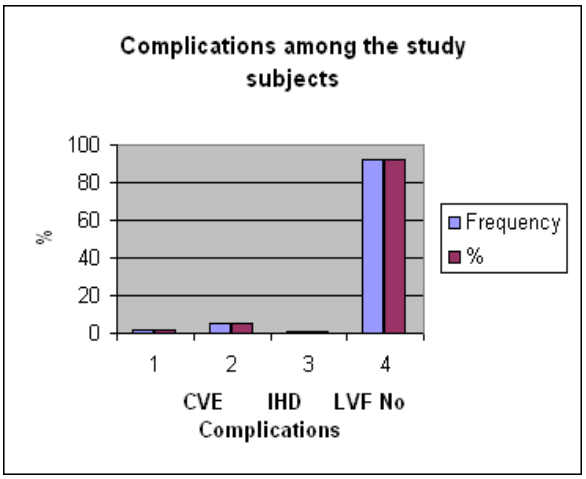


Fig 06. Complications

Type of therapy prescribed: Out of 100 prescripitions, 74% were Multi-therapy and 26% were Monotherapy.

Type of anti-hypertensive therapy used by yhe study subjects

Table 07. Type of Therapy

Therapy	Frequency	%
Monotherapy	26	26
Multitherapy	74	74
Total	100	100

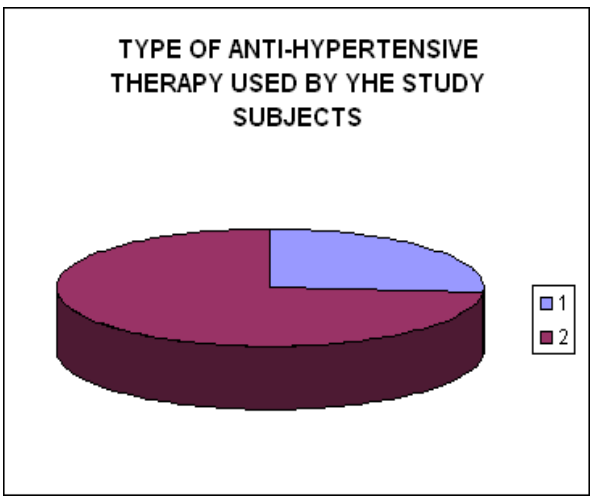


Fig 07. Type of Therapy

Number of drugs per prescription: Out of 100 prescription, 71% prescriptions had 2 drugs, 26% were monotherapy and only 3% prescriptions contained 3 drugs.

Table 08. Number of drugs

Number of antihypertensive drugs used by the study subjects

Number of drugs	Frequency	%
1	26	26
2	71	71
3	3	3
Total	100	100

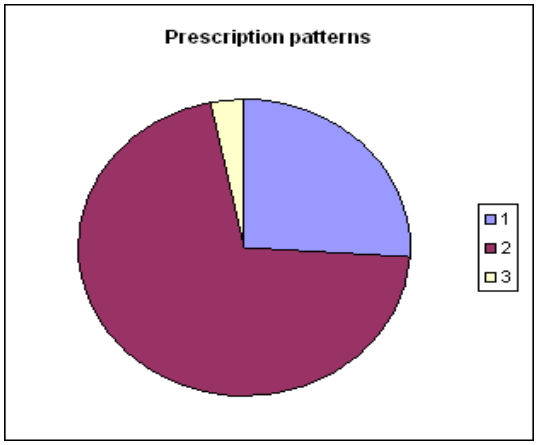


Fig. 08. Number of drugs per prescription

Prescription Patterns: Out of 100 prescriptions, combination of AT+AM was most frequently (57%) prescribed, followed by AM (21%), AM+EN (9%), AT (5%),AT+AM+TL(3%), AT+TL(2%) and EN+DR (2%) and least percentage of AT+EN with (1%).

Combination of antihypertensive drugs used among the study subjects

Table 09. Prescription patterns

Combination of drugs	Frequency	%
AMLODIPINE[AM]	21	21
ATENELOL[AT]	5	5
AT,AM	57	57
AM,EN	9	9
AT,TL	2	2
EN,DR	2	2
AT,EN	1	1
AT,AM,TL	3	3
TOTAL	100	100

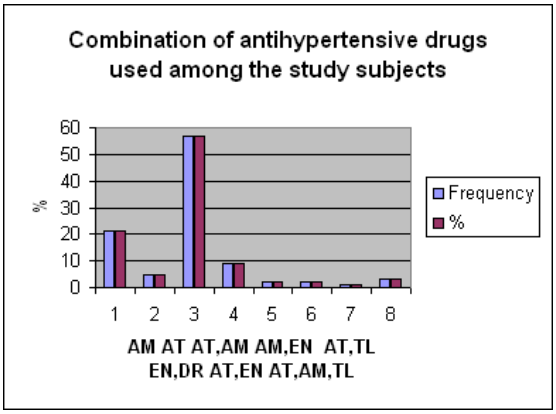


Fig 09. Prescription patterns

SUMMARY

Present study was undertaken with the objective of analysing prescription pattern and pharmacoeconomic evaluation of antihypertensive drugs along with quality of life in 100 patient, attending General medicine OPD at GGH Ananthapuramu.

Ethical clearance was obtained from IEC, GMC, Ananthapuramu.

Every patient in the study was thoroughly explained about the study and a written informed consent was taken.

The date collection had two sessions, one reading taken at first visit and next after 6 months. Details regarding drugs, their costs and physical as well as mental health dimensions were assessed.

After the statistical analysis of the data collected results showed that multitherapy was most frequently prescribed in monotherapy group Amlodipine was more cost effective than Atenolol and in multitherapy group Amlodipine with Enalapril combination was more cost effective than Amlodipine with Atenolol combination. Not much difference was observed in quality of life in patients of both groups in monotherapy and multitherapy.

LIMITATIONS OF THE STUDY

1) Sample sizes in the comparison groups were not equal. Study included 100 OPD patients, after recruitment the patients were analysed for the prescriptions and then data's were compared in most common prescriptions in both mono-therapy and multi-therapy.

2) Patients had a follow up for 6 months, in which two times data were recorded ,first time and then after 6 months. Follow up could have been extended and number of data collection sessions would have been increased, so as to get the consistent data. But due to feasibility problem follow up period was restricted for 6 months

3) Indirect and intangible costs were not much focused, as the study involved the OPD patients with more or less similar indirect costs.

4) Comparison of cost effective analysis in the group with comorbidity and without comorbidity was not done.

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