

## An Investigation on Prevalence of liver diseases in Hypertensive Patients on ACE Inhibitors

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### ABSTRACT:

**Introduction:** Hypertension is a serious medical condition as per WHO which can increase the risk of cardiac, neural, renal related diseases. It is considered as one of the major cause of premature death worldwide, with over a billion people having this condition. The hypertension is considered as a burden in low- and middle-income countries, in which two thirds of cases are found were largely due to increased risk factors in such populations in recent years. **Methodology:** This is a Prospective observational study conducted over a period of 12 months in the department of cardiology and General medicine and on patients taking ACE inhibitors with Hypertension, Patients are keenly assessed at baseline with reference to their age, gender, BMI, co- morbidity conditions, ACE inhibitors prescribed and duration of therapy. Follow up of the patients are conducted for 6 months are monitored, the datas were statistically expressed using Microsoft excel and the values are expressed in percentage. **Results:** In this study, among 112 patients the male patients are 61% and female patients 39% which shows more number of male patients are present in the study. The prevalence of liver diseases like jaundice and hepatitis were more in male population and also predominant with alcoholics. The drug Lisinopril shows more incidences when compared to other ACE inhibitors so alternative therapy along with effective dosage regimen should be recommended. The prevalence of hyperuricaemia in patients with ACE inhibitors was higher with females. BMI profile of the patients also has considerable effect over the prevalence of hyperuricaemia and the drug captopril causes higher number of incidences of hyperuricaemia. **Conclusion:** As per the findings, Prevalance of liver diseases are less common in patients taking ACE inhibitors having hypertension. Early diagnosis initiation of therapy will help to avoid complications, hence knowledge related to Prevalance of liver diseases are essential

knowledge for all health care providers. Involvement must be actively done by the entire well trained clinical pharmacist for identifying the problem and creating wide spread awareness among health care professionals.

**Key words:** Incidence, ACE inhibitors, Hypertension, Prevalance, Liver diseases, Hyperuricaemia.

### I. INTRODUCTION:

One of the leading riskfactor affecting morbidity and disability-adjusted life years worldwide is hypertension<sup>[1, 3]</sup>. Hypertension is a serious medical condition as per WHO which can increase the risk of cardiac, neural, renal related diseases. It is considered as one of the major cause of premature death worldwide, with over a billion people having this condition<sup>[1]</sup> The hypertension is considered as a burden in low- and middle-income countries, in which two thirds of cases are found were largely due to increased risk factors in such populations in recent years As per various literatures ACE inhibitors are found to be associated with incidences of liver injury.<sup>[3]</sup> It is also evident that some of the ACE inhibitors have associated with liver injury within 1 to 4 years of therapy, which is a quite weird pattern. In certain situations, even after years of safe use the liver diseases like jaundice and hyperuricaemia were reported in some patients.<sup>[4]</sup> This study was conducted enrolling all the male and female patients strictly on the basis of underlying disease (i.e.) hypertension, age and medication prescribed with ACE inhibitors which gives us an unbiased and confounding results. This study was designed in an attempt to understand the Prevalance of liver diseases in hypertensive patients on ACE inhibitors among rural population at a multispecialty hospital in Namakkal district.

### II. METHODOLOGY:

The aim and objectives of the study are to assess

the Prevalence of liver diseases in hypertensive patients with ACE inhibitors.

#### Plan of work

The proposed study entitled “An Investigation on the Prevalence of Liver diseases in Hypertensive patients on ACE inhibitors” is planned and carried out in a tertiary care hospital as given below.

#### Phase I

Identification of research problem and scope of the study

Literature survey

Preparation of study protocol

Obtaining ethical clearance from the hospital authorities

#### Phase II

Design of structured pro-forma

Patient selection

Obtaining patient consent

Data retrieval from the cardiology and general medicine department.

#### Phase III

Data analysis

Report submission

This was a Prospective observational study conducted over a period of 12 months in the department of General medicine and cardiology on Hypertensive patients taking ACE inhibitors, by enrolling all the male and female patients strictly on the basis of underlying disease (i.e.) hypertension, age and medication prescribed with ACE inhibitors. Total 230 patients who are having hypertension and under ACE inhibitor therapy were screened and 112 patients were selected based on the following inclusion and exclusion criteria for further study.

#### Inclusion criteria

- Patients of both the genders of more than 18years in age
- Patients with Hypertension prescribed with ACE inhibitors
- Both in and out patients

#### Exclusion criteria

- Patients who are not willing to participate in the study

- Pregnant and Lactating females
- Patients with insufficient data in their records

#### Ethical committee approval

The study protocol was approved by the institutional ethics committee of Vivekanandha Medical Care Hospital (Ref.No:SVCP/IEC/JAN/2016/13)

#### Data collection

Consent was obtained from each subject in Patient Consent form before initiating the study. Structured pro-forma was used to collect various clinical and demographic details of the patients such as age, gender, reason for admission, past medical history, past medication history, vital signs, lab investigations, primary diagnosis and treatment chart. Treatment data including prescribed drugs, doses, frequency and route of administration were also recorded.

#### Method

Patients were assessed at baseline with respect to age, gender, BMI, co- morbidity conditions, ACE inhibitors prescribed and duration of therapy. Patient was followed up for 6 months. Prevalance of liver diseases among hypertensive patients taking ACE inhibitors were monitored.

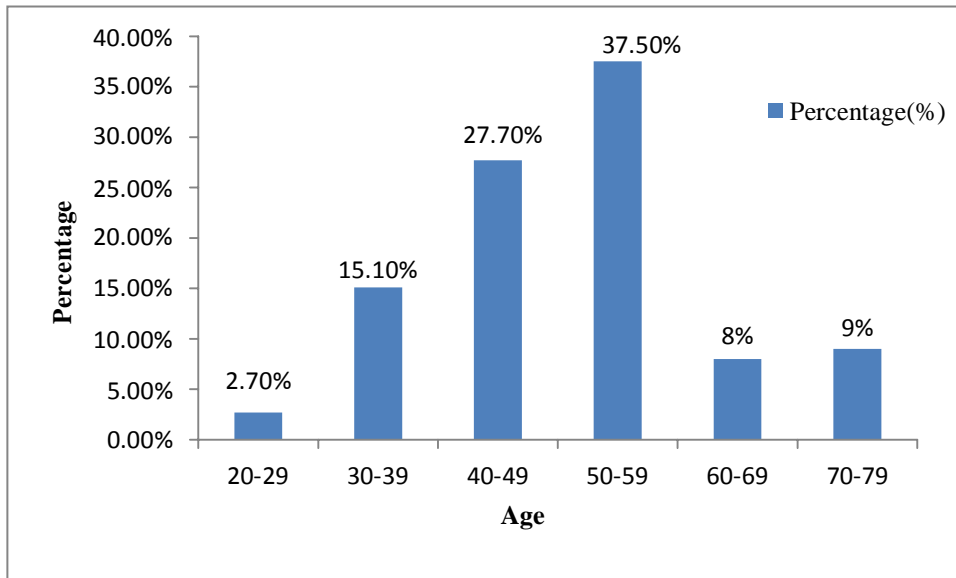
#### Statistics

The statistical analysis was done using Microsoft excel. All the datas were expressed in percentage. Collected data's were entered in Microsoft excel spreadsheet for further interpretations.

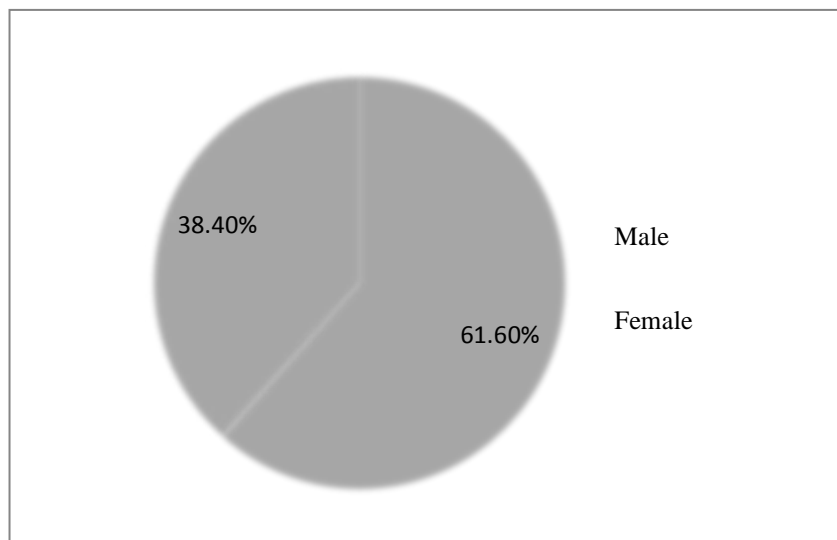
### III. RESULTS

A total of 230 patients who are having hypertension and taking ACE inhibitors in cardiology and general Medicine department were screened and 112 records were selected based on the inclusion and exclusion criteria

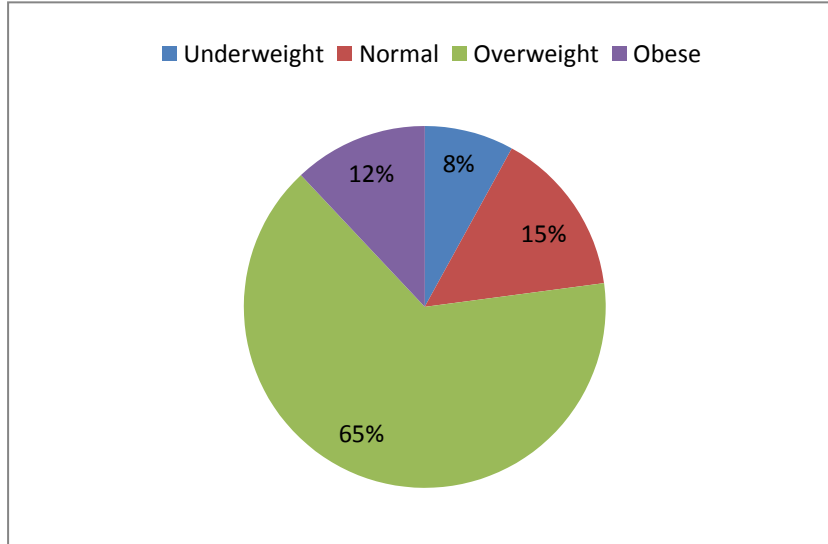
**Figure 1. Age Wise distribution of the study population (n=112)**



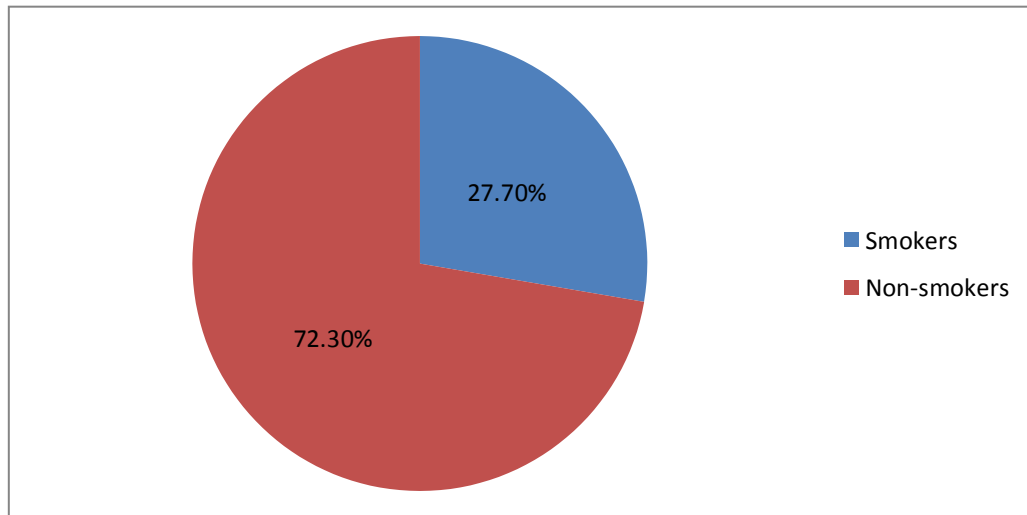
**Figure 2. Gender wise distribution among the study population (n=112)**



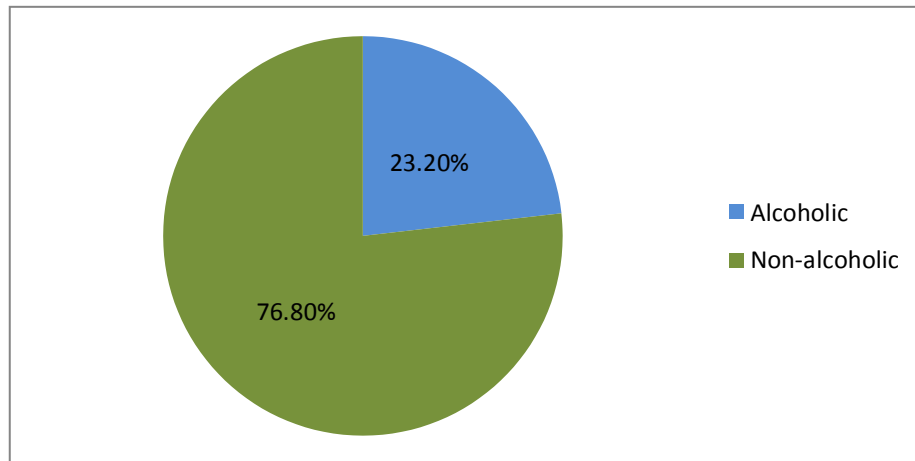
**Figure 3. BMI among the study population(n=112)**



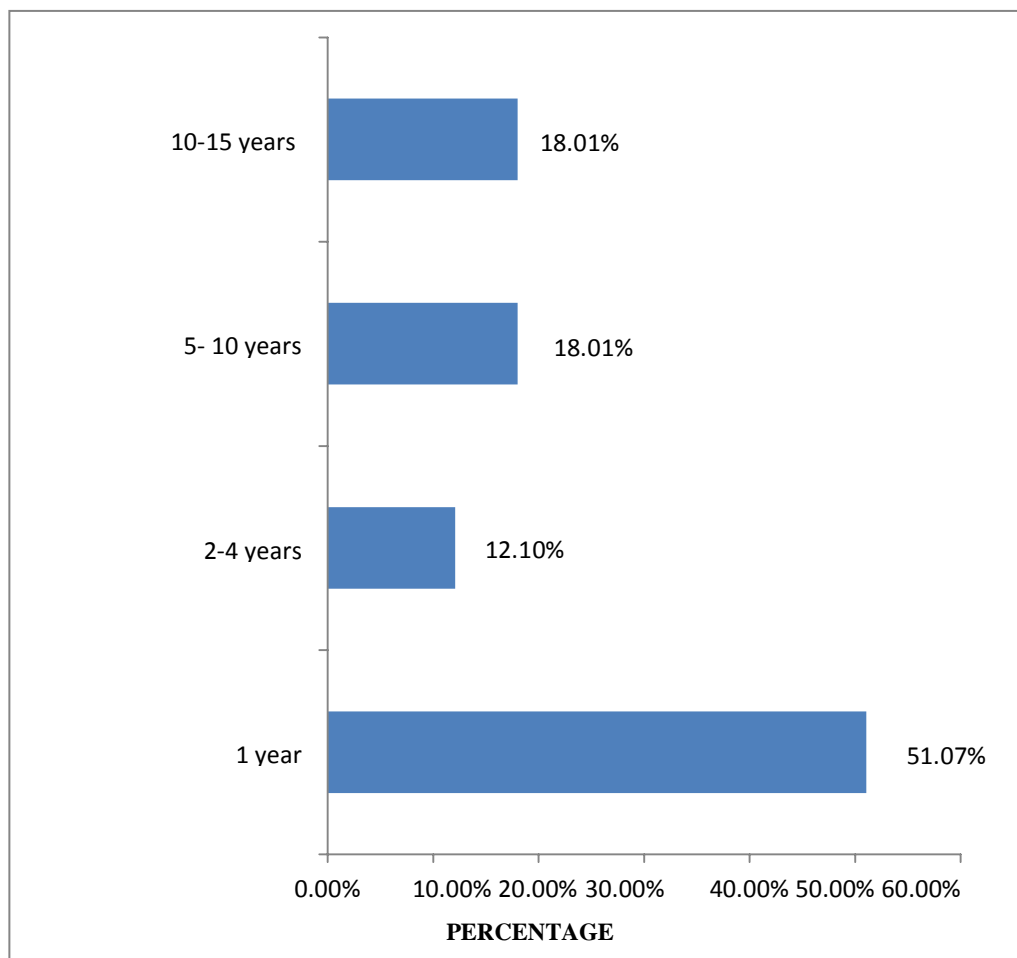
**Figure 4. History of smoking among the study population(n=112)**



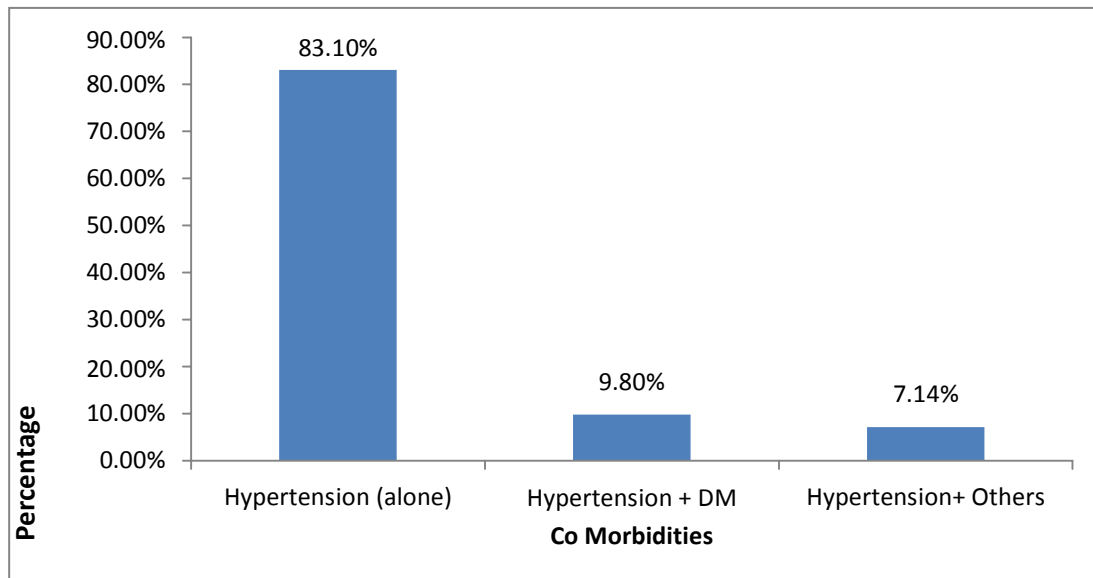
**Figure 5. History of alcoholism among the study population (n=112)**



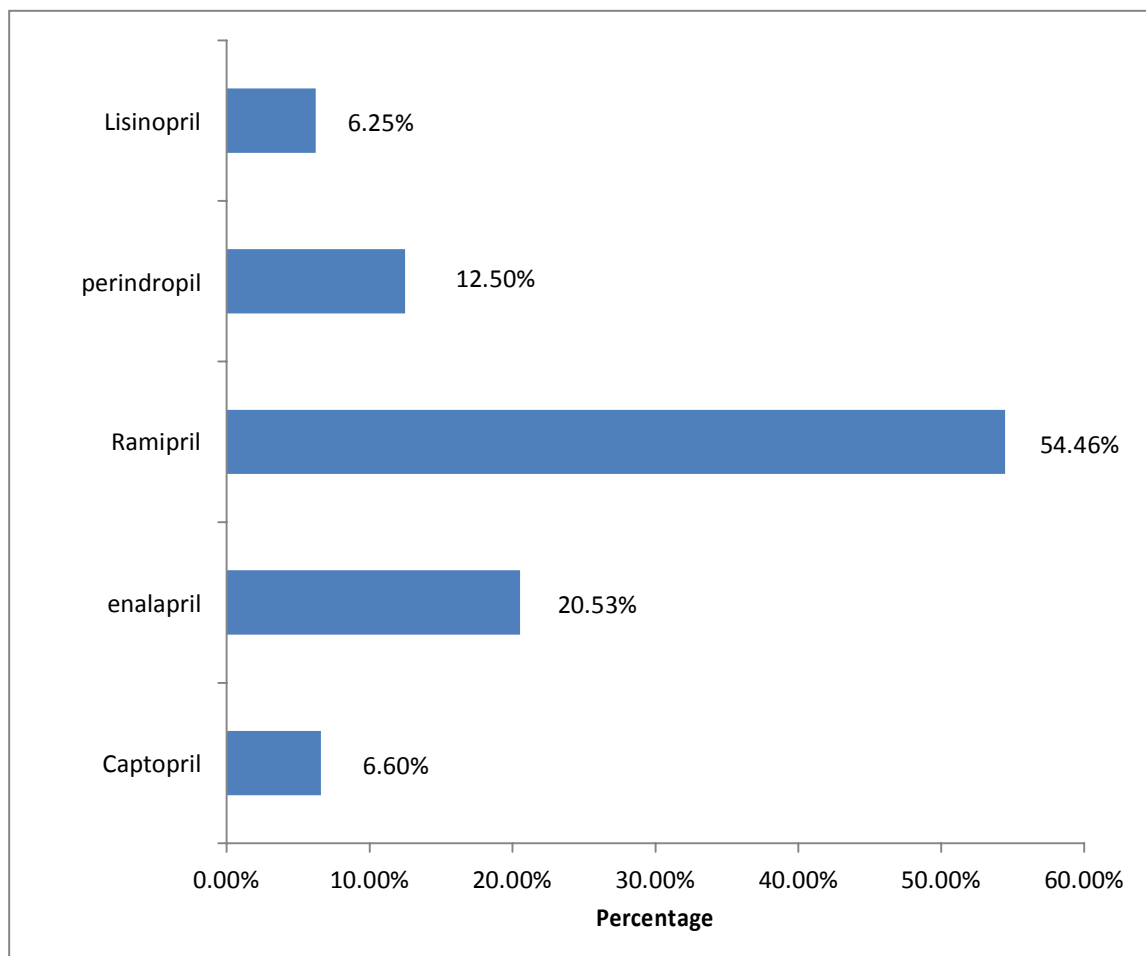
**Figure 6. Duration of hypertension among the study population(n=112)**



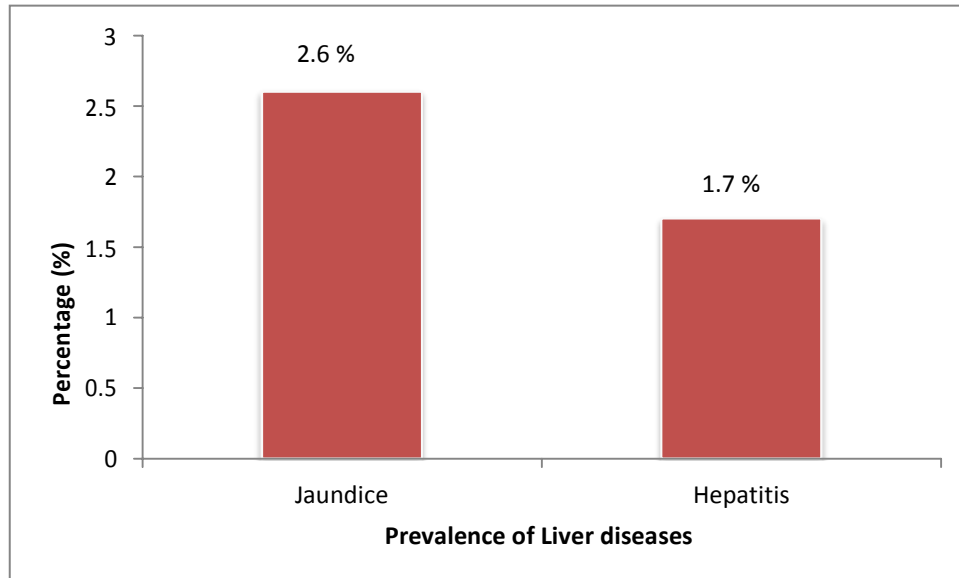
**Figure 7. Pattern of co-morbidities prevalence among the study population (n=112)**



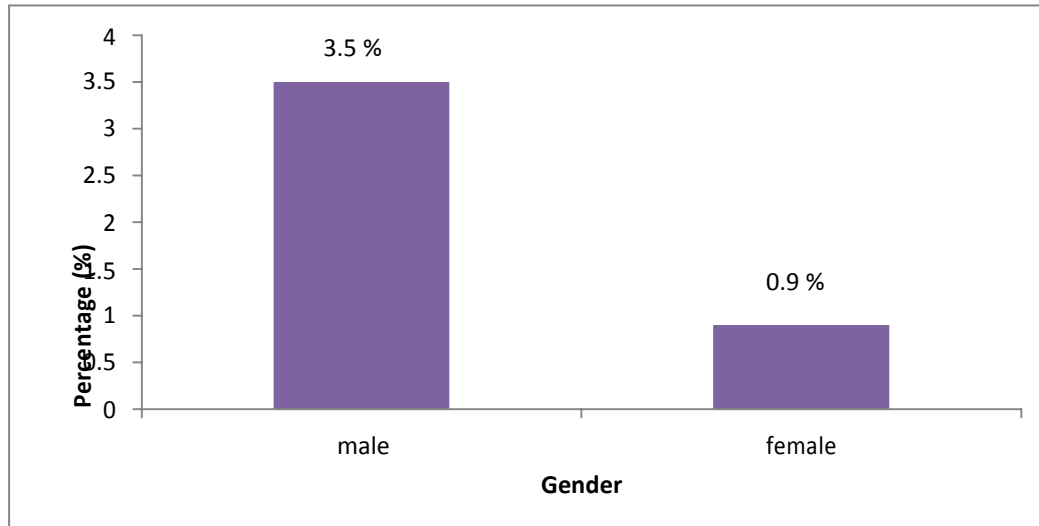
**Figure 8. ACE inhibitors prescribed in the study population (n=112)**



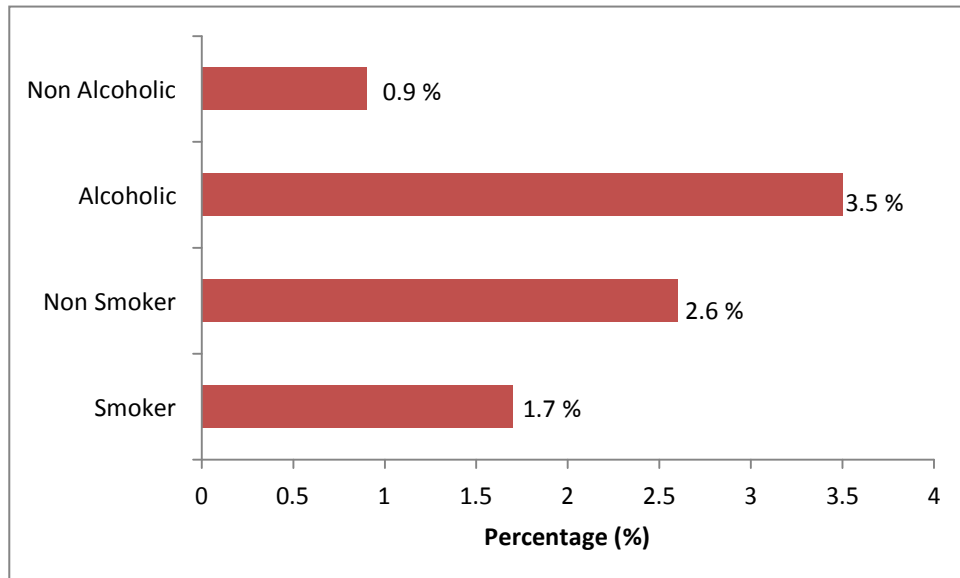
**Figure 9. Prevalence of Liver diseases**



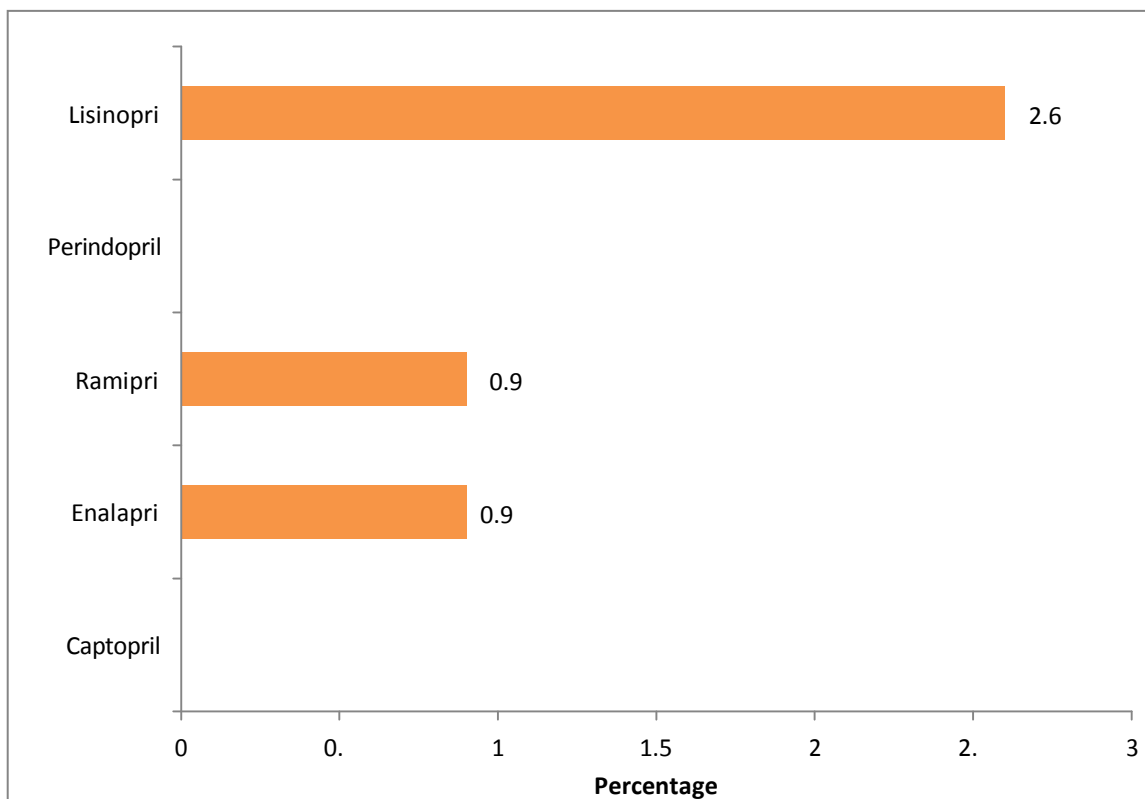
**Figure 10 -Prevalence of Liver diseases based on Gender (n=112)**



**Figure 11. Prevalence of liver diseases based on social history (n=112)**

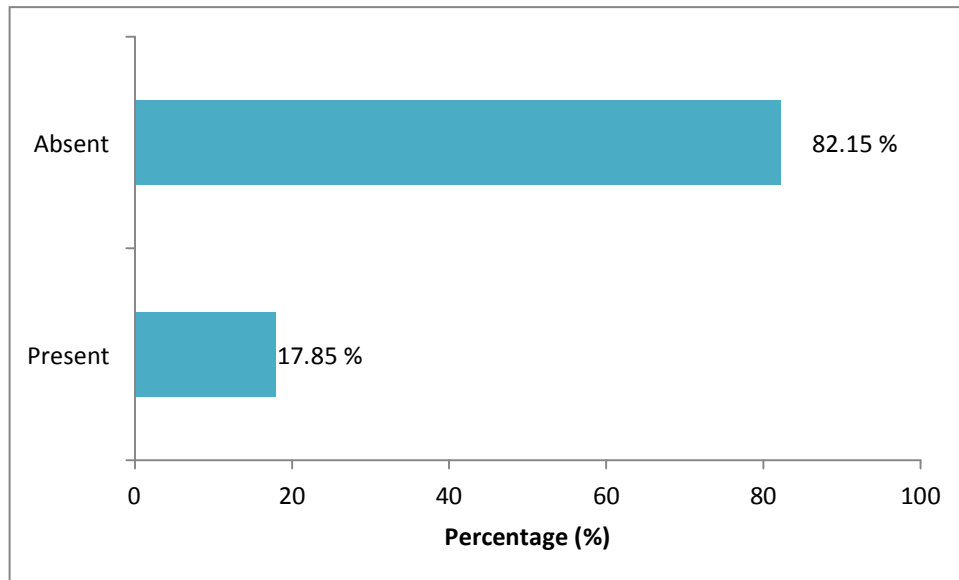


**Figure 12. Prevalence of liver diseases in patients on ACE inhibitors (n=112)**





**Figure 13. Prevalence of hyperuricaemia**



**Figure 14. Prevalence of hyperuricaemia based on gender (n=112)**

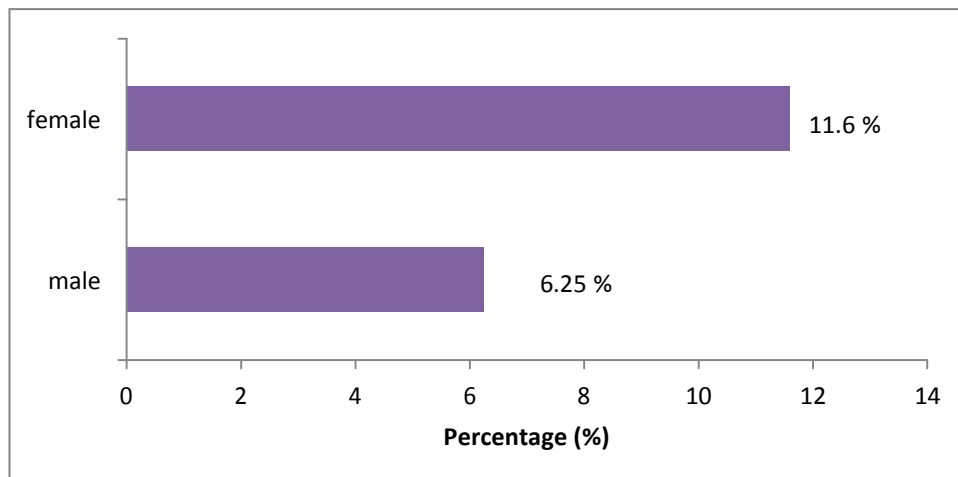


Figure 15. Prevalence of hyperuricaemia based on social history (n=112)

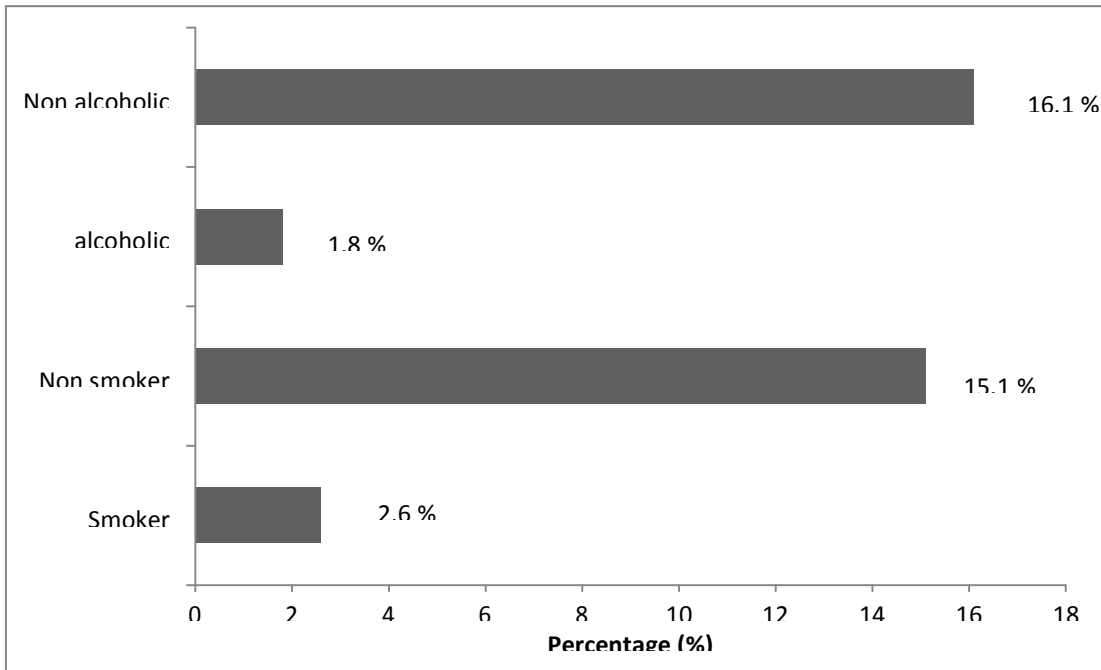
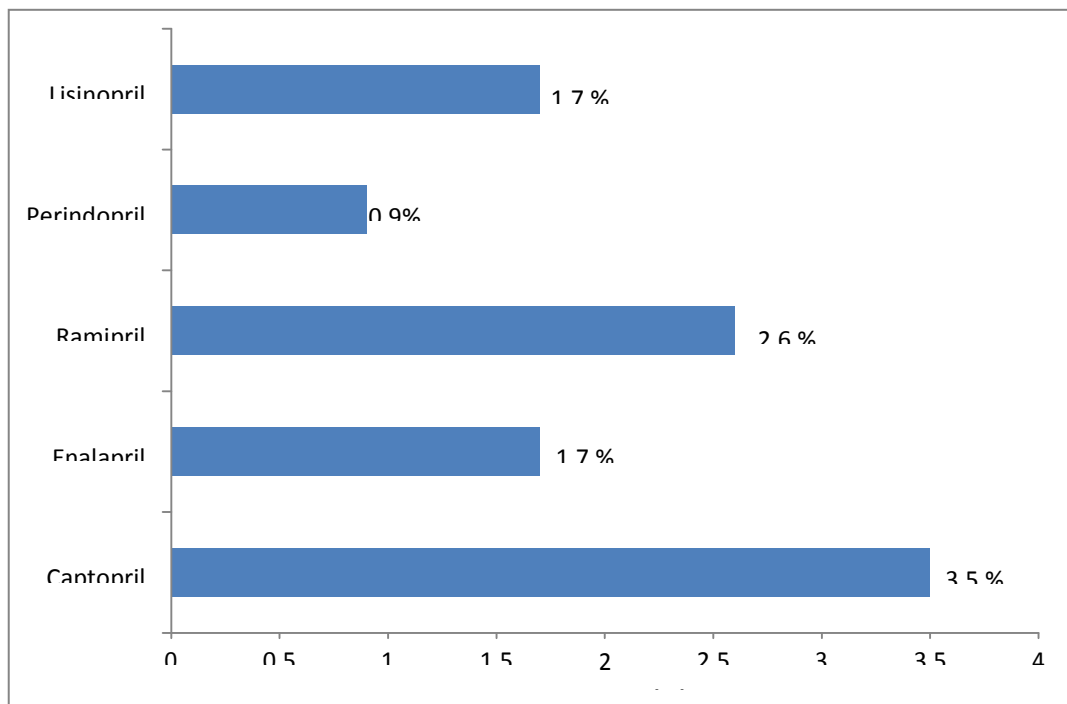


Figure 16. Prevalence of Hyperuricaemia in patients on ACE Inhibitors



#### IV. DISCUSSION:

The total outcome of the study is clear and demonstrative. This study comprised of 112 patients, out of which, most patients were in the age group of 50-59 years Mean age of the study population was  $55.7 \pm 6$  years. In this study, the male patients 61% were more predominant in number than the female patients 39%. A study conducted by Aslam et al. showed the patients were in the age group of 50-59 years with regard to gender distribution, 59.7% were males.<sup>[5]</sup> A study conducted by Hallberg p et al. shows that most of the patients were having normal body mass index. In present study majority of the patients were overweight<sup>[6]</sup> Out of 112 patients, non smokers and non alcoholic were more exposed to drug related outcomes than smokers and alcoholics. A total of 112 patients, 51.07% (59) were having 1 year duration of Hypertension, 12.1% (13) were having 2-4 years duration of Hypertension, 18.01% (20) were having 5-10 years duration of hypertension, and 18.01% (20) were having 10-15 years duration of Hypertension. (Figure 6). The co-morbidities like diabetes mellitus and other complications co-exist with hypertension. But patients with no co-morbidity other than hypertension are more predominant in my study. (figure 7) A total of 112 patients, 6.6% (7) prescribed with captopril, 20.53% (23) prescribed with enalapril, 54.46% prescribed with ramipril, 12.5% prescribed with (14) prescribed with Perindopril and 6.25% (7) prescribed with Lisinopril. (Figure 8) This shows that ramipril is the most prescribed drug in the study population.

##### Prevalence of Liver diseases

Among 112 patients prevalence of liver diseases due to ACE inhibitors were 5 in which 2.6% (3) had jaundice and 1.7% (2) had hepatitis. (Figure 9) In our study Social history shows among 5 patients having prevalence of liver diseases 1.7% (2) are smokers and 2.6% (3) are non smokers, 3.5% (4) were alcoholic and 0.9% (1) is non alcoholic which clearly demonstrates alcoholics are more prone to prevail liver diseases. (Figure 11) Among 5 patients having prevalence of liver diseases, 4 were male and 1 was female. (Figure 10). Out of 5 patients, prevalence of Liver diseases with ACE inhibitors Lisinopril shows more incidences. (Figure 12)

##### Prevalence of Hyperuricaemia

In our study we observed that 17.85% of patients with hypertension had hyperuricaemia which is in line with the study of Assob et al<sup>[8]</sup> his

study showed that 33% of total population had a high (UA) concentration, with 49.5% being hypertensive. Our study results also show that females are more prone to hyperuricaemia than male patients with hypertension. (Figure 14) Out of 20 patients having prevalence of hyperuricaemia 2.6% (3 patients) are smokers and 15.1% (17) are non smokers, 1.8% (2) were alcoholic and 16.1% (18 patients) were non alcoholic which clearly demonstrates that the subjects with incidences were non smokers and non alcoholics. (Figure 15). In our study, 20 patients with prevalence of Hyperuricaemia due to ACE inhibitors 3.5% (4) prescribed with Captopril, 1.7% (2 patients) prescribed with Enalapril, 2.6% (3) with Ramipril, 60.7%, 0.9% (1) with Perindopril. 1.7% (2) with Lisinopril. This shows captopril shows higher incidences of hyperuricaemia. (Figure 16)

#### V. CONCLUSION:

As per the findings, Prevalence of liver diseases are less common in patients taking ACE inhibitors having hypertension. Early diagnosis initiation of therapy will help to avoid complications, hence knowledge related to Prevalence of liver diseases are essential knowledge for all health care providers. Involvement must be actively done by the entire well trained clinical pharmacist for identifying the problem and creating wide spread awareness among health care professionals.

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