

## EVALUATION OF PULMONARY FUNCTIONS IN HYPERTENSIVE PATIENTS TAKING ANTIHYPERTENSIVE DRUGS.

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**Abstracts: Background and Objectives:** Chronic hypertension has been found to be associated with altered Pulmonary Function Tests (PFTs). However, alteration in PFTs and their association with antihypertensive drugs has not yet been established. Therefore, the present study was undertaken to find out relationship altered PFTs in hypertensive patients on an antihypertensive drugs for more than one year. **Methods:** Hypertensive patients were taken from OPD of Quresh Medical Trust, Ahmedabad and further divided into 2 groups, case group (n=50) those who were taking antihypertensive drugs for more than one year and control group (n=50) those who were not taking any antihypertensive drugs. PFT parameters (FVC, FEV<sub>1</sub>, PEFR & MVV) were studied in both the groups by using spirometer (Computerised Spirometer GMS-HELIOS 702). **Results:** The findings of Pulmonary Function Tests showing that FVC, FEV<sub>1</sub>, PEFR & MVV all were reduced in case group compared to control group and the difference was statically significant (p<0.01) **Interpretation & Conclusions:** Similar to earlier studies done in India and abroad we also found an impairment of the lung functions in hypertensive patients taking long term antihypertensive drugs especially Beta blockers<sup>1</sup>. So, the antihypertensive drugs should chose according to the status of the individual patients. Antihypertensive drugs (Thiazide diuretics, calcium channel blockers, newer beta1 blockers) which have less effect on airway functions are the drug of choice in hypertensive patients having airway dysfunction.<sup>2</sup>

**Key Words:** PFT, Antihypertensive drugs, Hypertension.

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### Introduction:

Hypertension is now become epidemic in modern civilized world, it affects billion of people worldwide and it is estimated by 2025, 1.56 billion adults will be hypertensive. Hypertension is estimated to cause 7.5 million deaths which accounts for 57 million disability adjusted life years (DALYs).<sup>3</sup> It becomes important public health challenge worldwide. Hypertension affecting almost all systems and organs of the body. Especially Hypertension has adverse effect on respiratory system and antihypertensive drugs have adverse effects on respiratory system as well.<sup>4</sup> But there are few studies showing effects of antihypertensive drugs on PFTs, especially Beta blockers. Due to its lower cost it is widely used in

India and having notorious effect of bronchoconstriction.

The association between blood pressure, antihypertensive drugs and lung function parameters in Indian population is much less investigated. Thus Aim of the study to determine whether antihypertensive drugs had an adverse effects on lung function.

### Objectives:

- 1.) To assess and compare PFT in normal and Hypertensive individuals.
- 2.) To assess and compare PFT in patients taking antihypertensive medications and patients who are on other forms of antihypertensive treatments (i.e. weight reduction, yoga, exercise, life style modifications).

**Material and Methods:**

Patients were taken from Quresh Medical Trust Ahmedabad and further divided into two groups, case group (N=50) those who were taking antihypertensive drugs for more than one year and control group (N=50) those who were not taking any antihypertensive drugs.

PFT parameters FVC, FEV1, PEFR and MVV were studied in both the groups by using Spirometer, computerized spirometer GMS HELIOS 702. Written informed consent was taken. We have taken the IRB permission for the current study.

**Exclusion Criteria:**

Smokers

Patients having URTI

Cardio Respiratory Illness

Any major diseases

**Result:**

Study population include 50 control and 50 case group, all being diagnosed patients of hypertension,

There were no statistically significant differences between the mean age, heights and weights of the control and cases. ( $P > 0.05$ )

The findings of pulmonary function tests showing that FVC, FEV1, PEFR & MVV all were reduced in case group compared to control group and the difference was statistically significant. ( $P < 0.01$ ).

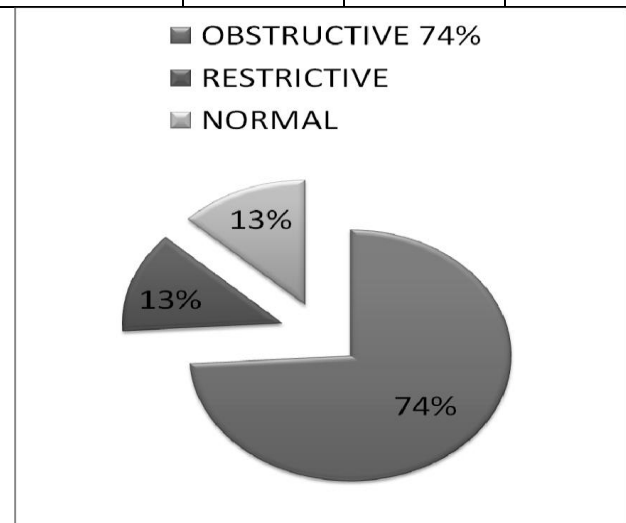
**Table: 1 physical characteristic of subjects.**

| Parameter            | Case<br>N=20<br>Mean | Controls<br>N=20 | P value    |
|----------------------|----------------------|------------------|------------|
| Age (years)          | 43.90                | 46.67            | $p > 0.05$ |
| Height(cms)          | 159.23               | 161.28           | $p > 0.05$ |
| Weight (kgs)         | 61.25                | 64.42            | $p > 0.05$ |
| Mean B.P.<br>(mm Hg) | 146.12               | 134.54           | $P < 0.05$ |
| Duration of          | 28.56                | 18.43            | $P < 0.05$ |

| HT (months) |  |  |  |
|-------------|--|--|--|
|             |  |  |  |

**Table: 2 Comparison of PFTs in case and controls.**

| Parameter  | Control | Case   | P value    |
|------------|---------|--------|------------|
| FVC(%)     | 89.36   | 64.63  | $P < 0.05$ |
| FEV1(%)    | 88.03   | 54.90  | $P < 0.05$ |
| PEFR(%)    | 77.70   | 58.76  | $P < 0.05$ |
| MVV(L/min) | 154.38  | 101.22 | $P < 0.05$ |

**Discussion:**

The study showed that pulmonary function test parameters with Hypertension and those who were on antihypertensive drugs were statistically significant lesser than normal controls ( $p < 0.05$ ). On comparison we found that 74% patients of hypertension were having obstructive pattern, while 13% of the patients were having restrictive pattern and however 13% of hypertensive patients had normal PFTs.<sup>5</sup>

There was no statistical difference between age, height, weight of the 2 study groups ( $p > 0.5$ ) hence both these groups were comparable.<sup>6</sup> Most of the patients were taking Beta blockers as

antihypertensive medications. Hypertension is the disease which affects the various systems of the body. Complications of the Hypertension are varied and well studied but research is on-going. Beta receptors play key role in regulation of bronchomotor tone.<sup>7</sup> Some studies proved that. Selective Beta blockers do produce bronchoconstriction. This may be most probable cause of obstructive pattern in these patients.<sup>8</sup> Beta blockers reduce the performance of respiratory muscles. Beta blockers also cause slight reduction of expiratory muscle strength causing proportional decrease of FEV<sub>1</sub> & FVC. This could be one of the reasons behind the restrictive pattern in some of our patients.<sup>9</sup> However further studies directing this issue are required. Addictive effect of both beta blockers and persistent high blood pressure responsible for altered PFTs but it's difficult to segregate the effect of high blood pressure and antihypertensive medication.<sup>10</sup>

#### Conclusion:

Similar to earlier studies done in India and abroad we also found an impairment of the lung functions in hypertensive patients taking long term antihypertensive drugs especially Beta blockers. So, the antihypertensive drugs should be chosen according to the status of the individual patients. Antihypertensive drugs (Thiazide diuretics, calcium channel blockers, newer beta1 blockers) which have fewer effects on airway functions are the drug of choice in hypertensive patients having airway dysfunction.<sup>11</sup>

#### Acknowledgment:

Hypertensive patients those who are on long duration antihypertensive drugs are on increased risk of developing respiratory pathology in the form of obstructive lung disease. They should be advised respiratory exercises and at regular interval PFT should be done and altered PFTs patients should better switch to other newer antihypertensive drugs.<sup>12</sup>

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