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**A STUDY OF UTILIZATION OF BILEVEL POSITIVE AIRWAY PRESSURE  
(BiPAP) WITH OTHER MEDICATION IN RESPIRATORY ILLNESS AT  
TERTIARY HEALTH CARE HOSPITAL**

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**ABSTRACT**

Bilevel positive airway pressure (BPAP), often known as BiPAP, is a breathing machine. It's a type of non-invasive ventilation that doctors may employ if you can breathe on your own but don't obtain enough oxygen or can't expel carbon dioxide. Unlike invasive mechanical ventilation, which uses a tube in your throat, BiPAP provides air via a mask on your face. The term "positive airway pressure" refers to the device pushing air at a higher pressure into your airway, which includes your nose, mouth, and windpipe (trachea). This increased pressure maintains your airway open, allowing air to enter and exit your lungs more effectively. "Bilevel" indicates that it provides airflow at two distinct pressures:

One for breathing and another for exhaling. The two levels are known as inhalation positive airway pressure (IPAP) and exhalation positive airway pressure (EPAP). The machine settings allow you to choose the timing of the two pressures (timed) or automatically alter the pressure based on your breathing patterns. In certain emergency or acute care circumstances, providers employ BiPAP. Some people keep a BiPAP machine at home for persistent diseases. BiPAP machines are employed in continuous conditions or in emergency situations where we require assistance with breathing.

**Keywords: BiPAP, Ventilation, Positive airway pressure, Breathing**

## INTRODUCTION

### BiPAP

Bilevel positive airway pressure (BPAP), often known as BiPAP, is a breathing machine. It's a type of non-invasive ventilation that doctors may employ if you can breathe on your own but don't obtain enough oxygen or can't expel carbon dioxide. Unlike invasive mechanical ventilation, which uses a tube in your throat, BiPAP provides air via a mask on your face [1-5]. The term "positive airway pressure" refers to the device pushing air at a higher pressure into your airway, which includes your nose, mouth, and windpipe (trachea). This increased pressure maintains your airway open, allowing air to enter and exit your lungs more effectively [6-10].

The term "bilevel" refers to airflow at two separate pressures: one for breathing and one for exhaling. The two levels are known as inhalation positive airway pressure (IPAP) and exhalation positive airway pressure (EPAP). The machine settings allow you to choose the timing of the two pressures (timed) or automatically alter the pressure based on your breathing patterns. In certain emergency or acute care circumstances, providers employ BiPAP. Some people keep a BiPAP machine at home for persistent diseases [11-14].

BiPAP machines are utilized in hospitals and

can also be purchased for home usage. Home BiPAP machines are small, around the size of a toaster. The equipment has a tube that connects to a mask that is worn over the nose and mouth. BiPAP machines, like other ventilators, employ pressure to pump air into the lungs. Depending on the settings, this opens the lungs, increasing the level of oxygen in the blood while decreasing carbon dioxide. These machines are referred to as "bilevel" because they feature two air pressure settings.

- When you breathe in, BiPAP machines provide more air pressure. This is sometimes called inspiratory positive airway pressure (IPAP).
- When you exhale, the machine lowers the air pressure. This is known as expiratory positive airway pressure (EPAP).

Some BIPAP machines include a timer that may be set to maintain a specific number of breaths per minute. BIPAP machines can be used in hospitals to treat respiratory crises. Non-invasive treatments are frequently preferred over intubation. Doctors typically utilize them in circumstances that are not severe enough to necessitate intubation. For example, a BiPAP machine may be used to treat respiratory failure caused by a COPD flare-up, pulmonary edema, or pneumonia.

**Objective:**

- To carry out observative study on utilization of BIPAP machine in tertiary care hospital.
- To observe the use of BIPAP machine in various disease conditions.
- To evaluate the benefits of BIPAP machine.
- To evaluate the risk factors of BIPAP machine.
- To observe any contraindications caused by the use of BIPAP

**METHODOLOGY**

This study is going to be conducted at Mallige Hospital. For this study, data of patients are collected using the data collection form after the patient gives the data voluntarily after signing the consent form or from the medical record department after their approval.

**Inclusion criteria**

- Patient having the age of 18 years and above.
- Patient prescribed with bronchodilators.
- Patient having known case of asthma, COPD and sleep apnea

**Exclusion criteria**

- Incomplete cases

**RESULTS**

Out of the total 154 cases of patients using BiPAP 60% were male and 40% were female. Majority of the patients belongs to the age group of 70 years and above. Majority of the BiPAP case patients were in the weight category of 61-70kg. Risk factors in the patient given with BiPAP was found to be highest in hypertension (59%), aspiration pneumonia (43%) and local skin damage (14%). Count of duration of BiPAP was found to be majority given only at night. Amongst the patients almost 120 patients were with no signs of any allergies and only few patients were suffering for any of the allergies. In maximum patients BiPAP has shown improvement in 13 quality of sleep. The Pco2 chart indicates that the most frequent readings were in the 15-40 mmhg range, almost 80 number patients were having Pco2 level of 15-40 range

**1. GENDER DISTRIBUTION OF THE PATIENTS**

Out of the total 154 cases of renal diseases 60% patients were males and 40% patients were females.

**Table 1: Gender distribution**

<b>GENDER</b>	<b>PERCENTAGE</b>
<b>MALES</b>	<b>60%</b>
<b>FEMALES</b>	<b>40%</b>

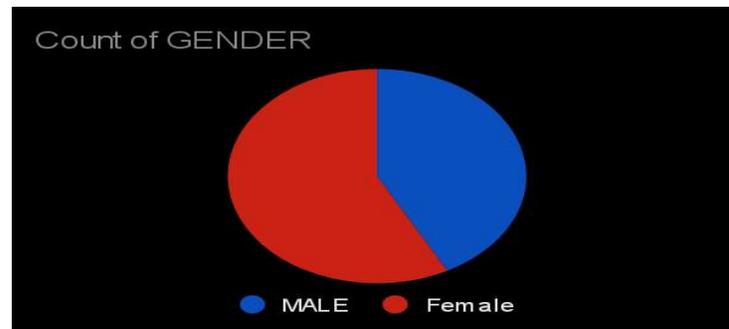


Figure:1 Gender Distribution

## 2. WEIGHT DISTRIBUTION OF THE PATIENTS

The weight distribution of the patients is depicted by the following graph and showed that majority of BiPAP case patients were in

the weight category of 61-70 kg. Most no of patients were seen within the weight group of 61-70kg. Most no of patients were seen within the weight group of 61-70kg.

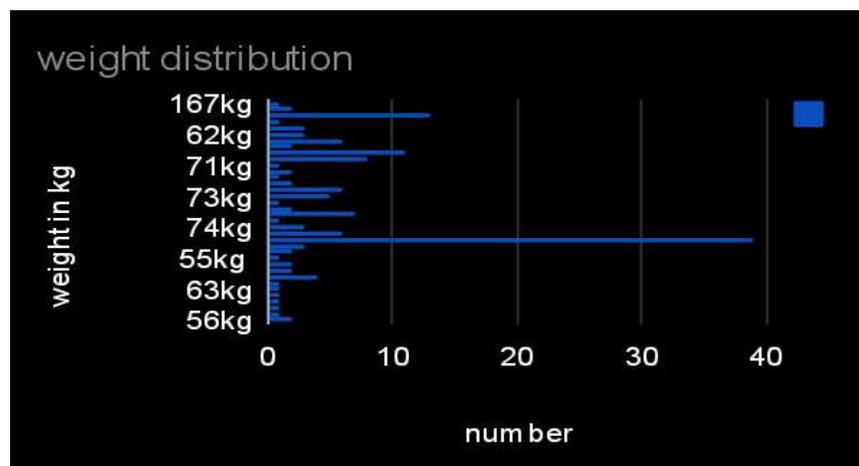


Figure 2: Weight distribution

## 3. RISK FACTORS OBSERVED WITHIN DISTRIBUTION

The following were the risk factors observed among the total of 154 cases enrolled in the study. The graph below shows the distribution

of these risk factors among the patients. Risk factors in the patient given with BiPAP was found to be highest in hypertension (59.2%), aspiration pneumonia (43.5%) and local skin damage (14.3%).

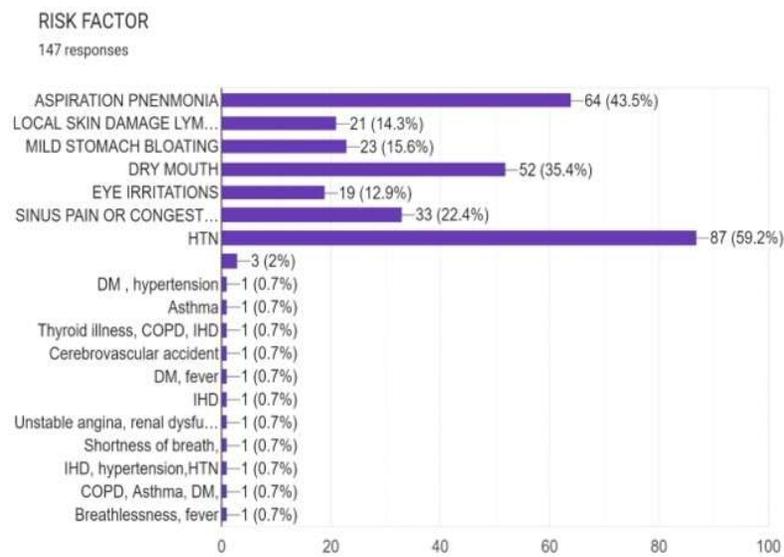


Figure 3: Risk factors and their frequency

#### 4. DURATION OF BiPAP

Count of duration of BiPAP was found to be majority given only at night. Amongst the

cases collected and reviewed highest number of female patients received BiPAP.

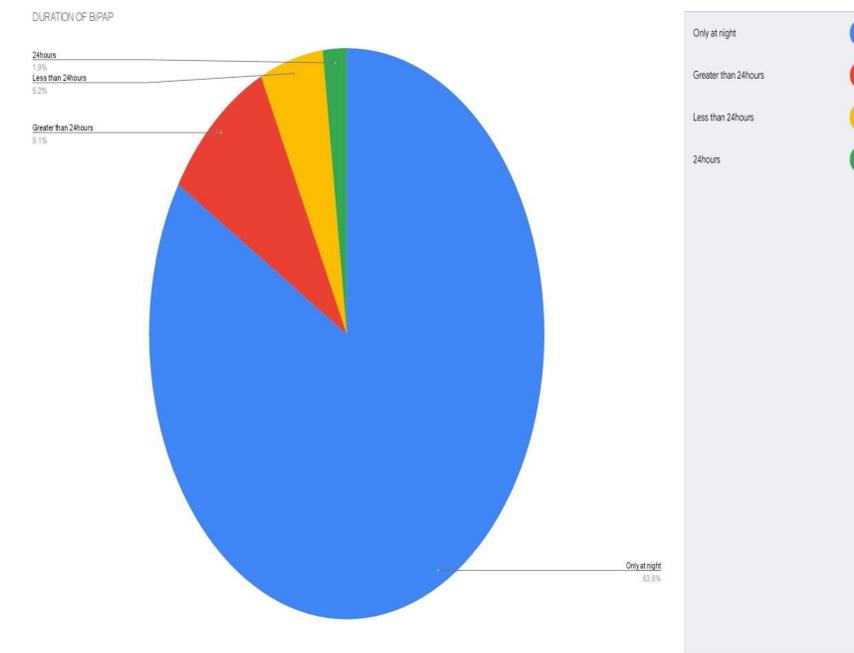


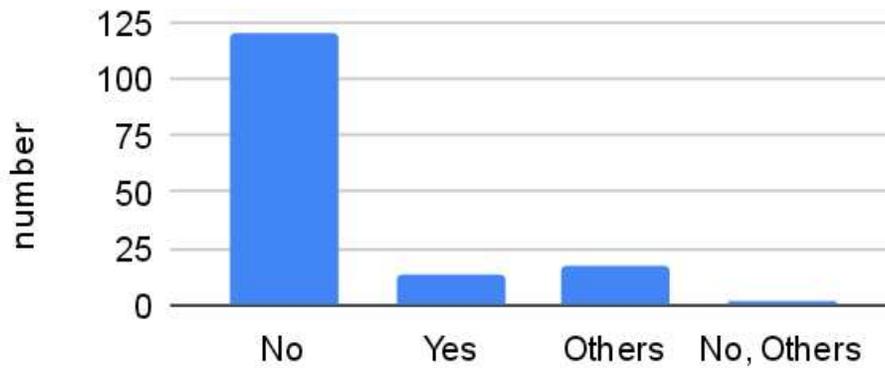
Figure 4: Duration of BiPAP

**5. COUNT OF ALLERGIC PATIENTS**

Count of allergic patients was found to be that majority of the patients were without any allergies. Amongst the patients almost 120

patients were with no signs of any allergies and only were patients were suffering for any of the allergies.

Count of allergy patients



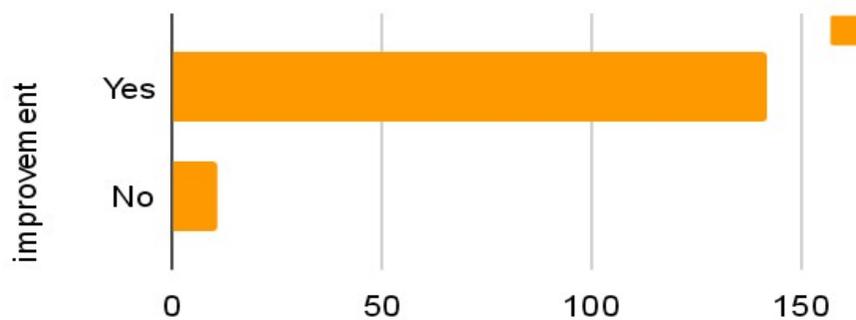
allergic  
Figure 5: Count Of Allergic Patients

**6. COUNT OF IMPROVEMENT BY BIPAP**

In maximum patients BiPAP has shown improvement in quality of sleep As BiPAP is given when the patient is diagnosed with obstructive sleep apnea along with other

complications. In maximum patients BiPAP has shown improvement in quality of sleep As BiPAP is given when the patient is diagnosed with obstructive sleep apnea along with other complications.

Count of improvement by BIPAP



number  
Figure 6: Count Of Improvement By BiPAP

**7. SpO2 (OXYGEN SATURATION)**

**LEVELS:**

The SpO2 chart indicates that the most frequent readings were in the <90% range, which is concerning as normal SpO2 should be 95% or higher. This low oxygen saturation

likely prompted the use of BiPAP. In maximum patients BiPAP has shown improvement in quality of sleep, As BiPAP is given when the patient is diagnosed with obstructive sleep apnea along with other complications.

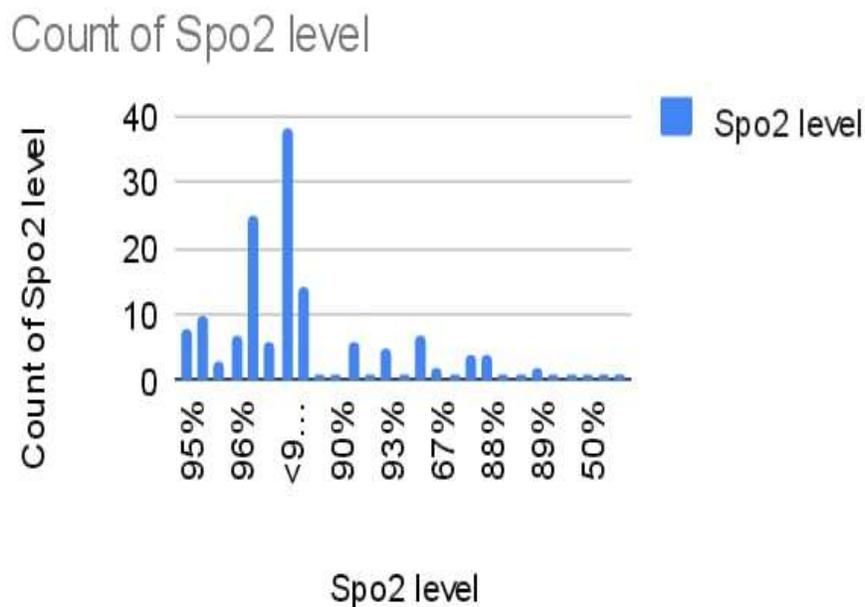


Figure 7: SpO2 (Oxygen Saturation) Levels count

**8. DISTRIBUTION OF MEDICATIONS**

The antibiotics chart shows various types used, with the highest counts for statins (likely staph-related). Antibiotics (possibly antiviral

or antifungal) and mucolytics. Nearly 38 patients were treated with this and the rest were treated with other medications.

Count of Medication history

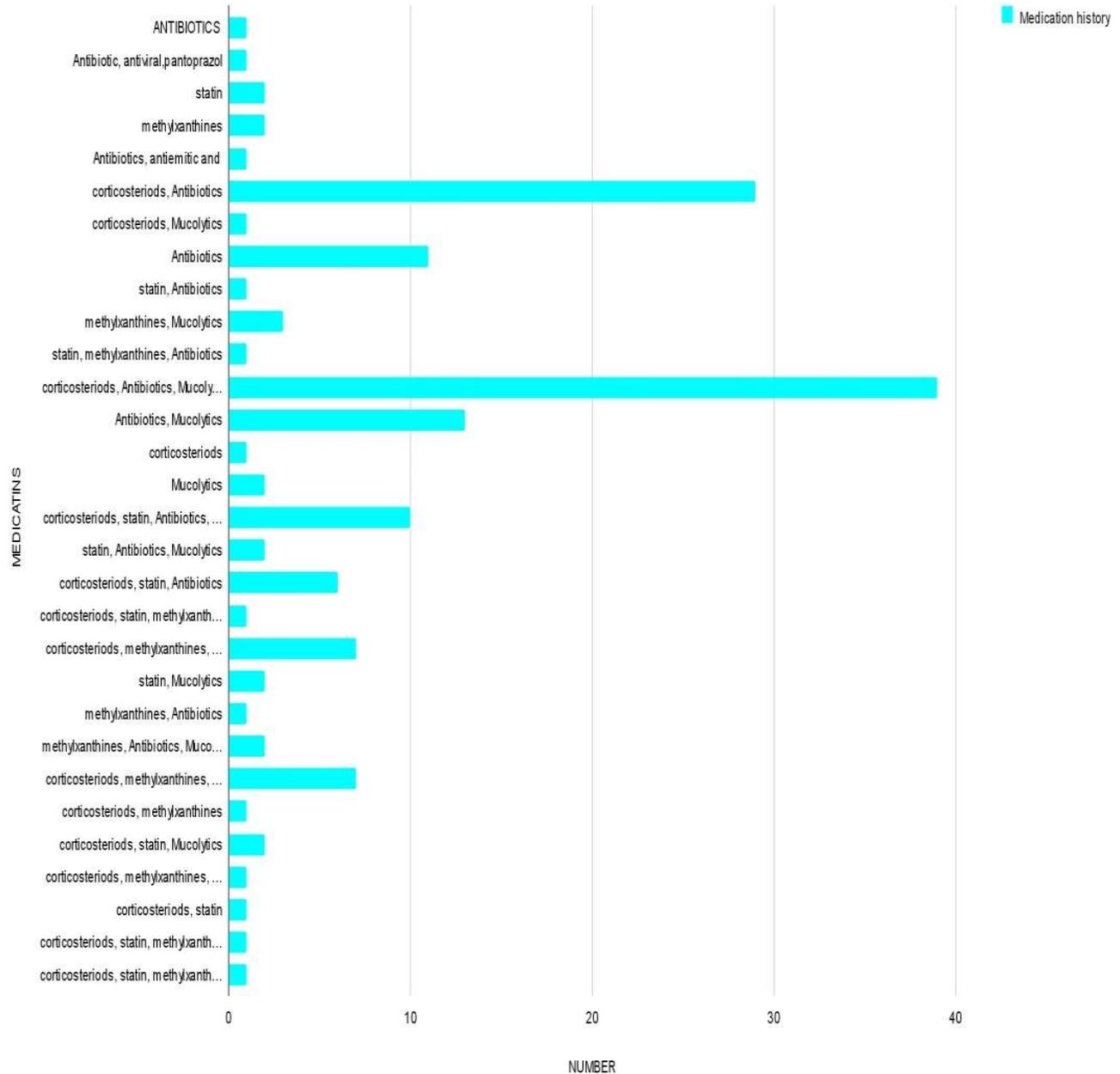


Figure 8: Distribution Of Medication

**CONCLUSION:**

This is an observational research on the use of BiPAP machines in critical care medicine. In the appropriate patient population, it can be utilized instead of invasive ventilation to maintain patients off mechanical ventilation.

It is critical to select the appropriate patient, as BiPAP in the improper context may not only be ineffective but may also put the patient at risk for aspiration. The typical BiPAP patient is aware with a strong need to breathe. They either require aid with distending pressure or

with increasing their tidal volumes with additional support. Choosing initial BiPAP settings is simple once you've determined which therapy is best for your patient. There are three primary parameters to alter, as well as one additional "back-up" setting. First, you'll adjust the oxygen delivery (FiO<sub>2</sub>), a distending pressure to help recruit alveoli (EPAP), and a high pressure to supplement the patient's natural breathing (IPAP). The backup setting is a basic respiratory rate (note that this setting does not replace the patient's spontaneous breathing). After 30 minutes, the effectiveness of BiPAP is assessed using an arterial blood gas.

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