International Journal Dental and Medical Sciences Research
Volume 5, Issue 3, May - June 2023 pp 595-598 www.ijdmsrjournal.com ISSN: 2582-6018

Utility and Outcome of Non-Invasive Ventilation in Patients of Copd with Type 2 Respiratory Failure in Tertiary Care Hospital

Dr Madhav Dawkore, Dr. Radha Munje
, Dr. Sanjay Gour

Date of Submission: 09-06-2023 Date of Acceptance: 19-06-2023

I. INTRODUCTION:

Burden of Chronic obstructive pulmonary disease (COPD) in world: Around 65 millions[1]

- Burden of COPD in India: Around 17 millions
- Patient of chronic obstructive pulmonary disease have frequent exacerbations and few of them land up in type 2 respiratory failure. Such patients may need ventilatory support either invasive or non invasive(NIV)
- NIV refers to the provision of ventilator support through the patient's upper air way using a mask or similar device but not by end tracheal tube.
- NIV has developed from home ventilation, predominately used for the treatment of hypoventilation in patients with neuromuscular disease or sleep apnea, In recent years however its use has expanded to include supporting patients with acute hyper capnicrespiratory failure due to COPD. NIV has effectively used in high dependency units or ward areas also.[2]
- There are many advantages of using NIV which include avoidance of tracheal intubation and its associated morbidity and mortality. On NIV patients is able to eat, drink, cough and expectorate, take Medications by taking break from treatment[2]
- Failure to maintain adequate gas exchange is known as respiratory failure and is characterized by abnormalities of ABG tensions3.

a)Type 1 failure: PaO2 <60mmHg (<8KPa), a normal or low PaCO2 b)Type 2 failure: PaO2 <60mmHg (<8KPa), PaCO2 >45mmHg(>6KPa), can be acute, acute on chronic or chronic3.

- Non-invasive ventilation (NIV) in the management of acute type 2 respiratory failure in patients with chronic obstructive pulmonary disease (COPD) represents one of the major technical advances in respiratory care over the last decade[4].

NEED FOR THE STUDY

- Type 2 Respiratory failure is a medical emergency situation in the respiratory department which significantly increases the mortality and require long term ICU or hospital care.
- Non invasive ventilation in the management of Type 2 respiratory failure is one of the major technical advances in the respiratory care which not only reduces the need of intubation but also duration of hospitalization.
- The this study UTILITY AND OUTCOME OF NON INVASIVE VENTILATION IN PATIENTS OF COPD WITH TYPE 2 RESPIRATORY FAILURE IN TERTIARY CARE HOSPITAL is being undertaken

OBJECTIVES OF STUDY:

- To study outcome of non invasive ventilation in patients of COPD with type 2 respiratory failure.
- To study proportion of patients requiring invasive ventilation.
- To study various factors associated with NIV failure if any
- To study complications associated with NIV
- To study factors associated with refusal of NIV by patient

PLACE OF WORK / SOURCE OF DATA:

- Indoor patients admitted in department of respiratory medicine / ICU at IGGMC Nagpur.

DURATION OF STUDY: Two years from November 2017 to nov 2019

METHOD OF COLLECTION OF DATA/ SELECTION OF SUBJECTS

STUDY DESIGN: prospective observational study

SAMPLE SIZE:60 cases of COPD with type 2 respiratory[8]

INCLUSION CRITERIA

1) Patients admitted in IGGMC Nagpur in respiratory medicine/general medicine ward

International Journal Dental and Medical Sciences Research
Volume 5, Issue 3, May - June 2023 pp 595-598 www.ijdmsrjournal.com ISSN: 2582-6018

and in RICU/MICU will be included in this study.

2) Patient with arterial blood gas showing pH< 7.35 and PaCO2> 45 mmHg.
3) Primary diagnosis of COPD with exacerbation.
4) Patients giving consent for NIV.

EXCLUSION CRITERIA:

1) Patients not giving consent and uncooperative patients.
2) Patients with contraindications for NIV.
3) Patients needing immediate mechanical ventilation for COPD with exacerbations.
4) Patients with pneumothorax.

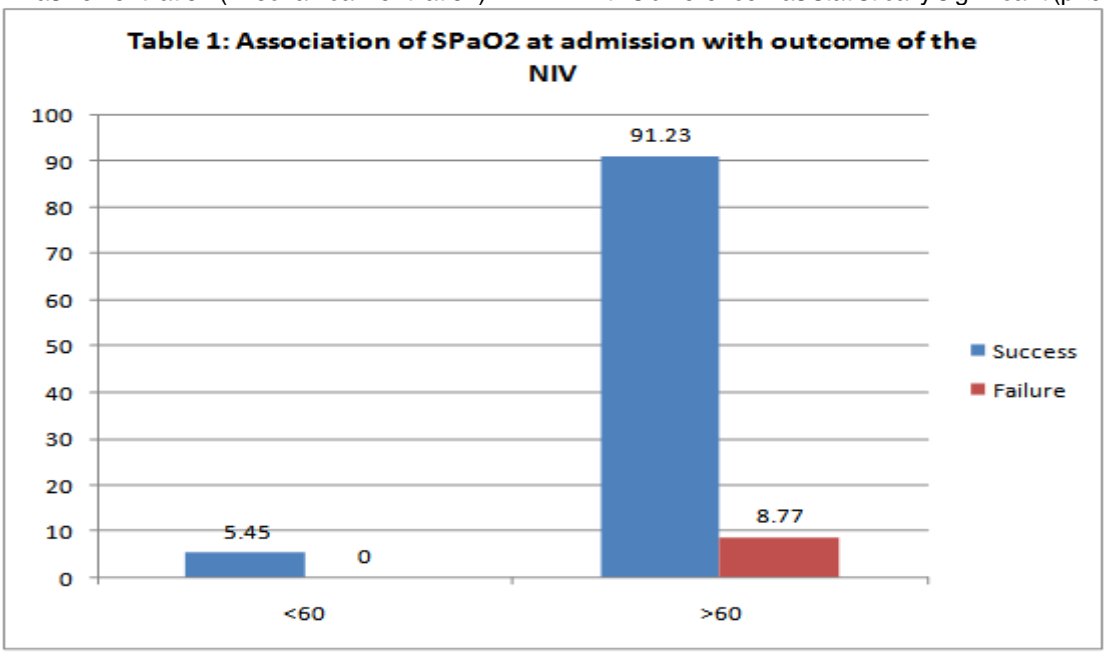
II. METHODOLOGY:

1) All patients of COPD diagnosed with type 2 respiratory failure fulfilling inclusion/exclusion criteria will be recruited for the study after obtaining written informed consent
2) Demographic data ,history, clinical examination, and relevant investigations for the diagnosis of type2 respiratory failure will be recorded in a pre structured proform a
3) NIV-BIPAP(mode spontaneous /spontaneous-timed) will be used in all patients
4) Patients will be closely observed for improvement in SpO2 and ABG and pressure will be adjusted accordingly.
5) Patients who have detoriation of pH and increase in PaCO2 , worsening of mental status ,intolerance to NIV, will be proceeded to invasive ventilation (mechanical ventilation).

III. RESULTS

• The study had male preponderance (40/60) with a mean age was 65.67+9.92 years.
• The most common symptom on presentation was breathlessness seen in all 100% of the patients.
• The mean SPO2 levels at admission were 78.55 and after 12 hours of receiving NIV support it improved to 88.23 and this improvement in SPO2 was statistically significant • The mean pH levels at admission were 7.31 and after 12 hours of receiving NIV support it improved to 7.39 and this improvement was statistically significant(P<0.001).
• There was a significant improvement (P < 0.001) in the mean PaO2 levels after 12 hrs of NIV support from 56.7+13.28 to 69.33+17.77 mm Hg. This improvement continued up to weaning.
• There was a significant improvement (P < 0.001) in the mean PaCO2 levels with 12 hrs NIV support from 69.20+13.49 to 53.36+13.82mm Hg. This improvement continued up to weaning.
• 14(23.33%) study subjects improved with NIV support for less than or equal to 24 hours, 31(51.67%) improved between 24 hours to 72 hours of NIV support and 15(25%) required ≥72 hrs of NIV support for improvement.
• The mean age of the patients who failed NIV was significantly higher than those who succeeded.
• Patients with the successful outcome of NIV had a higher mean SPO2 (79.36±11.57) at admission as compared to patients with NIV failure who had lower mean SPO2 (69.60±3.85) at admission and this difference was statistically significant (p<0.001)

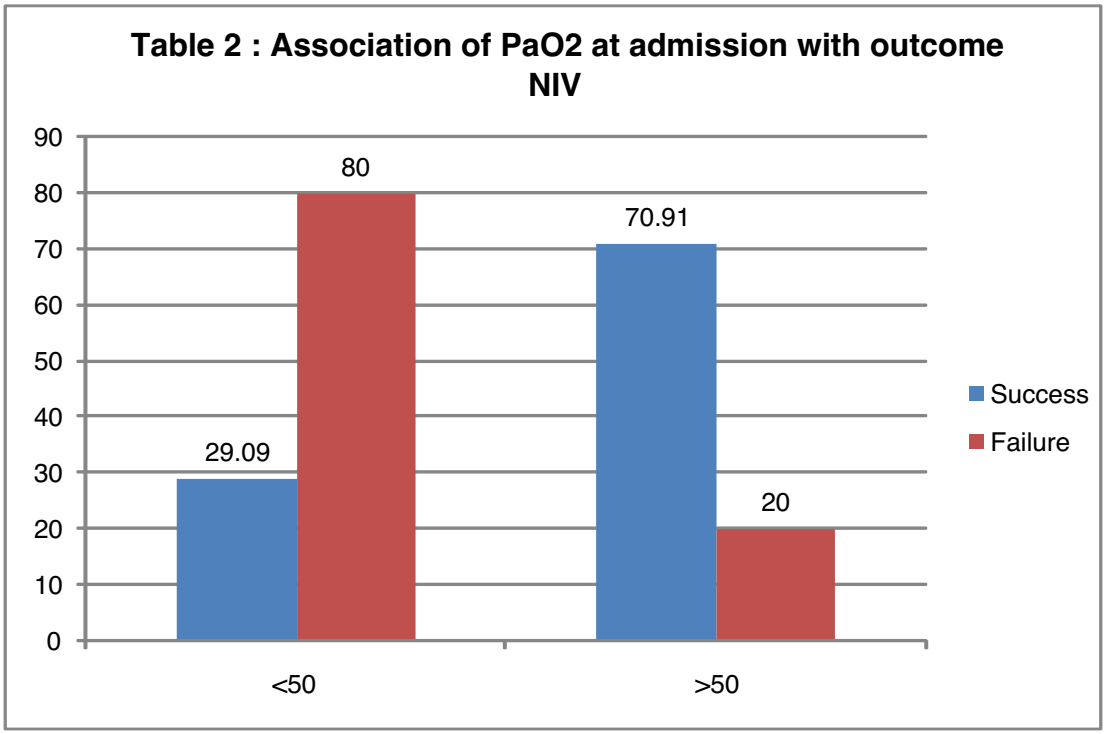
Table 1: Association of SPaO2 at admission with outcome of the NIV



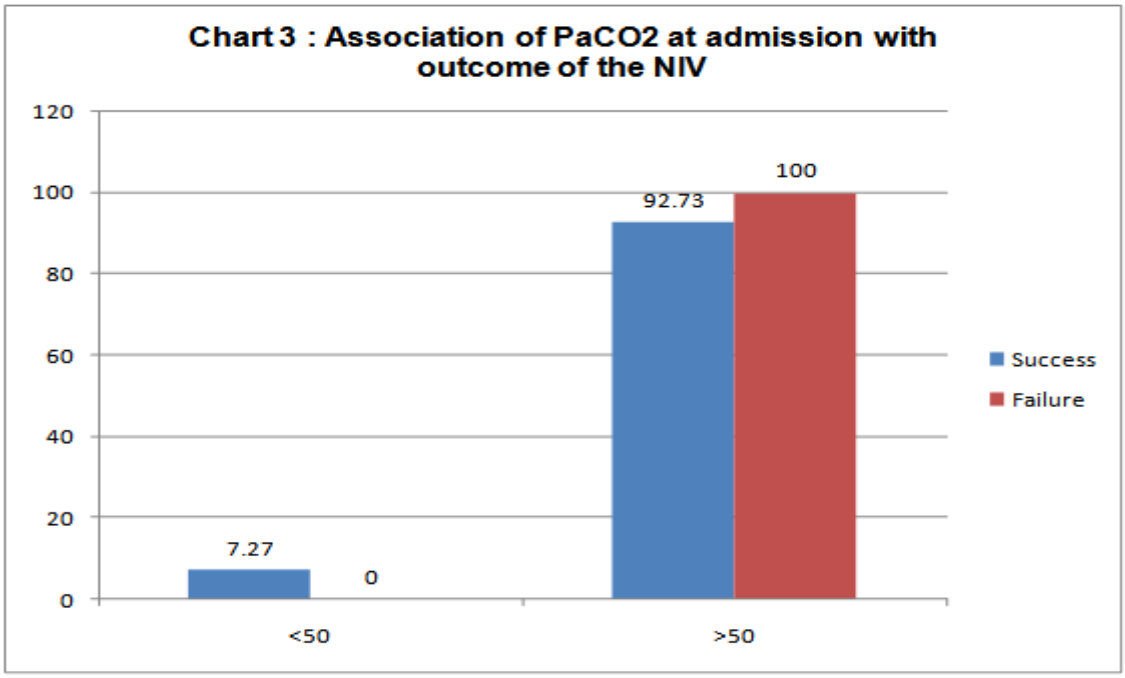
International Journal Dental and Medical Sciences Research
Volume 5, Issue 3, May - June 2023 pp 595-598 www.ijdmsrjournal.com ISSN: 2582-6018

• Mean pH value on admission was significantly lower (p<0.001) in patients who failed NIV i.e. 7.20±0.007 compared to that in NIV successful outcome 7.32±0.009.

• Mean PaO2 value on admission was significantly lower (p<0.001) in patients who failed NIV i.e. 46.54±4.84 compared to that in NIV successful outcome 57.63±13.44.



• Mean PaCO2 value at admission was significantly higher (P < 0.001) in patients who failed NIV (90.5±7.99) compared with NIV responders (67.26±12.18).



• The difference in gender, smoking status of the patient, and co morbidities at the time of admission had no impact on the outcome of NIV.
• In the present study, NIV was successful in 91.67%of patients with 55 patients weaned successfully off NIV. Out of 60 patients, 4 patients needed to be shifted on mechanical intubation and 1 died.
• Thus, old age, low SPO2, low pH, low PaO2 and high PaCO2 at the time of admission associated with failure of NIV.
• The study, thus, demonstrated that NIV is not only a feasible ventilator modality but also a treatment that is associated with significant improvements in clinical and laboratory parameters in cases of COPD with type 2 respiratory failure averting the need for mechanical ventilation.

LIST OF REFERENCES:

[1]. World Health Organisation. Burden of COPD. Available from :http://www.who.int/respiratory/copd/burden/en/
[2]. Noninvasive ventilation in chronic obstructive pulmonary disease: management of acute type 2 respiratory failure: national guidelines. Royal college of physicians: 2008;11
[3]. G, Pitoyo Singh CW. Non-invasive ventilation in acute respiratory failure. Acta med indones. 2014;46(1):74-80.
[4]. Roberts CM, Brown JL, Reinhardt AK, Kaul S, Scales K, Mikelsons C, et al; Non invasive ventilation in chronic obstructive pulmonary disease: management of acute type 2respiratory failure. Cin med J R call physicians London.2008;8(5):5017-21.