

HIGH FLOW NASAL CANNULA OXYGEN THERAPY VERSUS CONTINUOUS POSITIVE AIRWAY PRESSURE TO PREVENT ENDOTRACHEAL INTUBATION IN COVID-19 PATIENTS

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INTRODUCTION

COVID-19 pandemic was a global problem that affected the whole societies in many life aspects specially the health care systems around the world. Among the numerous complications that can be caused by the virus, acute hypoxemic respiratory failure (AHRF) is the most critical one. Due to the rapid spread of the infection that occurred in clusters, the number of patients requiring oxygen therapy was faced by a shortage of ICU beds and ventilators. Also, invasive mechanical ventilation (IMV) was associated with high mortality rate and increased risk of ventilator associated complications. So, different non-invasive ventilation (NIV) techniques such as high flow nasal cannula (HFNC) and continuous positive airway pressure (CPAP) were applied for managing the patients to avoid endotracheal intubation.

AIM OF THE WORK

The aim of this work was to compare between HFNC versus CPAP in prevention of endotracheal intubation in COVID-19 patients.

PATIENTS AND METHODS

Patients: This study was carried out on forty patients who were admitted to Critical Care Department of Alexandria University Hospitals with AHRF due to COVID-19 infection. Our patients were older than 18 years with hypoxic index from 100 to 150 and arterial oxygen saturation deteriorating or non-improving on conventional oxygen therapy (COT) with no other medical condition that can cause hypoxia such as COPD, heart failure, ESRD and pregnancy.

Methods: This study was an observational comparative prospective cohort study. The forty patients were divided into two groups, 20 patients for HFNC (group I) and 20 patients for CPAP (group II). The following data were collected from every patient on admission after enrollment into the study: demographic data including age and sex, medical and surgical history, Glasgow coma score (GCS), Acute physiology and chronic health evaluation (APACHE II) score, CT chest, and different laboratory investigations. The heart rate (HR), respiratory rate (RR), arterial oxygen saturation (SaO_2), and hypoxic index (HI) were recorded at 0, 6, 12, 24 hours then daily after application and the results were compared between the two groups.

In the two groups:

Success was defined as: weaning of the device and switching to COT.

Primary failure was defined as: need for endotracheal intubation.

Secondary failure was defined as one of the following:

- Recurrence of hypoxemia after weaning of the device.
- No improvement of hypoxemia on the device.
- Non-compliant patient.
- Need for switching from one device to the other as a rescue trial.

RESULTS

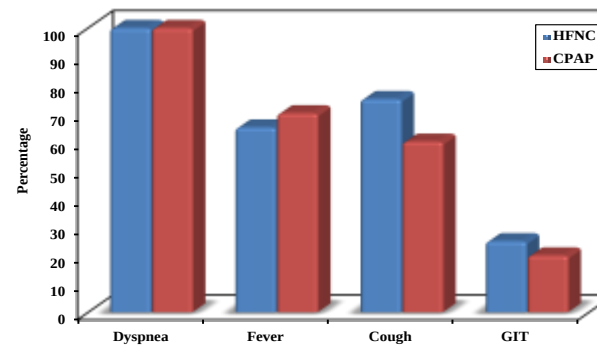


Figure 1: Comparison between the two groups according to clinical picture

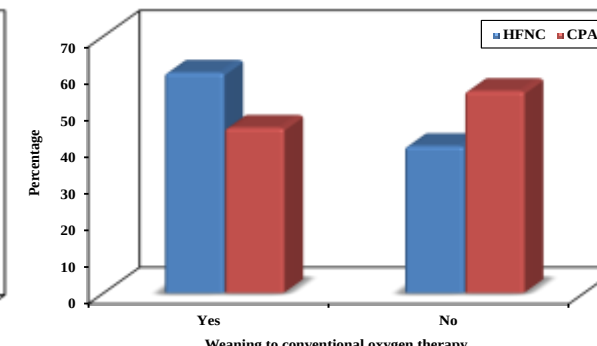


Figure 2: Comparison between the two groups according to success of the device and weaning to conventional oxygen therapy

Table 1: Comparison between the two groups according to the need for endotracheal tube

ETT	HFNC (n = 20)		CPAP (n = 20)		χ^2	P
	No.	%	No.	%		
Yes	8	40.0	11	55.0	0.902	0.342
No	12	60.0	9	45.0		

χ^2 : Chi square test

p: p value for comparing between the two studied groups

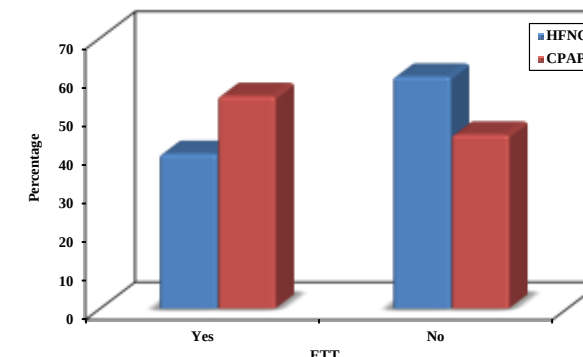


Figure 3: Comparison between the two groups according to the need for ETT

Table 2: Comparison between the two groups according to secondary failure

Second failure	HFNC (n = 20)		CPAP (n = 20)		χ^2	P
	No.	%	No.	%		
Non improved hypoxemia	7	35.0	9	45.0	0.417	0.519
Non-compliant patient	9	45.0	10	50.0	0.100	0.752
Shifted to the other device	9	45.0	3	15.0	4.286*	0.038*

χ^2 : Chi square test p: p value for comparing between the two studied groups

*: Statistically significant at $p \leq 0.05$

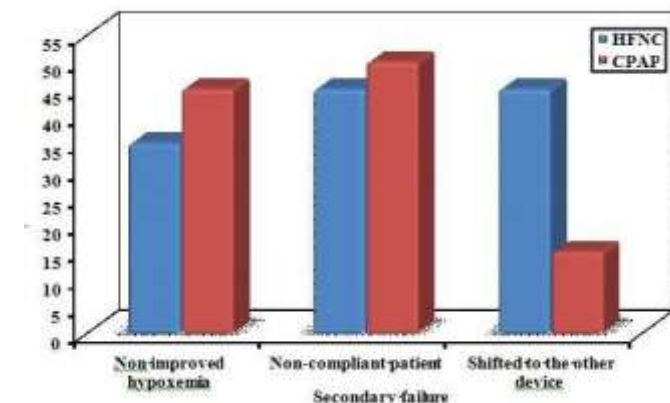


Figure 4: Comparison between the two groups according to secondary failure

CONCLUSION

This study suggests that HFNC and CPAP have no significant difference regarding their efficacy in reducing the need for endotracheal intubation and improving AHRF in COVID-19 patients who don't require urgent intubation and they are valuable NIV devices that any of them according to availability should be used to reduce the need for endotracheal intubation and IMV.