Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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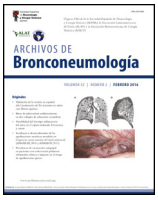

Editorial

Non Invasive Respiratory Support Therapies in COVID-19 Related Acute Respiratory Failure: Looking at the Neglected Issues

Las terapias respiratorias no invasivas en la insuficiencia respiratoria aguda asociada a COVID-19: analizando los problemas desatendidos

According with data from ISARIC, 20% of patients with COVID-19 require an admission to intensive care unit (ICU) or high dependency unit (HDU),[1] whereas about 29% of them received one of noninvasive respiratory support therapies (NIRT) such as continuous positive airway pressure (CPAP), bi-level noninvasive ventilation (BL-NIV) or high-flow nasal cannula (HFNC).[1]

Reviewing the recent publications specifically addressing the application of NIRT in COVID-19 related acute respiratory failure (ARF) we found 21 publications including 1553 patients.[2–23] The only important outcome always reported in all papers is the success rate in avoiding endotracheal intubation (ETI), achieved, on average, in 60%, 55% and 59% with, respectively, HFNC, CPAP and BL-NIV. Moreover, employed protocols, methodology and data collected in the published studies are extremely heterogeneous.

To be able to better interpret the prognostic impact of NIRT during current COVID-19 pandemic, more data are needed. Collecting a full set of parameters and clinical details is highly needed (Panel).

Pulmonary and non pulmonary physiology: Severity of lung (PaO_2/FiO_2 ratio) and pump failure (pH) are strong predictors of NIRT success.

PaO_2/FiO_2 ratios were only described in 15 studies,[2,4,6–8,10,11,13,15,16,21–23] ranging from an average of 118 (minimum 103, maximum 153) in CPAP studies and 105 (minimum 69, maximum 186) in HFNC studies. Data on pH and $PaCO_2$ are lacking in the majorities of the studies.

Door to mask time: timely delivery of NIRT is a critical goal. Average Door to mask time was 1.7 days and was only described in 3 papers.[15,18,23]

Dedicated NIRT environment: NIRT should be carried out in specially designated settings such as Respiratory Intermediate Care Units.

From the analyzed studies, only 2 did not describe the dedicated area[14,18]; in 8, the interventions were carried out in wards,[3,8,10,12,15,18,19,23] 4 in Respiratory Intermediate Care Units,[2,4,11,24] 3 in ICU's,[7,9,22] 3 in a mixed setting (ICU, Wards and Emergency Department)[5,16,20] and one at the Emergency Department.[21] Only one series reported using negative pressure rooms.[8]

Mask-on time: cumulative actual NIRT use should be stated. Average Mask on time was 5.9 days, described in 9 of the 13 CPAP studies,[3,5,7,8,10,12,13,19,23] and 4.6 days in the 5 of 8 HFNC studies.[14,16–18,22]

Time of NIRT to intubation was stated in 7[5,8,10,13,16,18,23] studies, ranging from 4 h[8] to 4 days.[23]

NIRT Equipment: type of ventilators and interfaces should clearly reported Helmet CPAP mainly using a flow generator was applied in 8 studies,[4,7,9,13,19–21,23] while Oro-nasal mask CPAP was used in 6 studies.[3,5,8,10–12] In 4 studies portable home ventilators were used[3,8,11,12] in 3 advanced NIV-ventilators,[4,10,21] while in 2 ICU ventilators.[5,17]

Escalation plan: In three HFNC studies,[5,15,16] escalation plan did not include NIV or CPAP. Studies included a mean of 22.3% of patients with do-not-intubate orders (ranging from 0,[3,8,9] to 100%[12]).

NIRT rotation: sequential application of HFNC and Bi-NIV sessions may improve tolerance and efficacy on oxygenation. Therapies rotation was only described in 4 studies,[4,9,12,20] basically HFNC during CPAP/NIV intervals,[4,9,20] for feeding[20] and sleep,[9] and night-time CPAP after NIV weaning.[12]

NIRT complementary therapies: NIRT outcome may be improved with pronation and analgo-sedation.

Four studies included awake proning sessions.[4,5,16,23] There was no mention of sedation in any reports.

Causes of mortality need to be stated but they were not reported in any of the studies.

Conclusion

In conclusion, even if NIRT have been shown to be effective tools in preventing ETI in COVID-19 acute respiratory failure, further studies designed to address important neglected issues are needed to better tailor each treatment for each individual case performed by each individual team; management should not be altered on the basis of expert opinion only! It is essential that researchers performing observational studies include relevant indicators like the ones we pointed out even during pandemics.

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