El estudio electrodiagnóstico realizado ocho días después del inicio de la clínica neurológica, informó de latencias distales motoras (LDM) alargadas tanto en extremidades inferiores y superiores, así como potenciales con cierta dispersión temporal. Ausencia de ondas F, tanto en nervios tibiales posteriores como en nervios cubitales. Respuesta en nervio facial tanto derecho como izquierdo de LDM muy alargadas con dispersión temporal del potencial. En los troncos nerviosos sensitivos de extremidades superiores existe desincronización del potencial, con velocidades algo disminuidas, a diferencia de EEII que no presentan trastorno sensitivo. Estudio compatible con polineuropatía sensitivo-motora de predominio desmielinizante.

A la luz de este caso clínico, reforzamos la hipótesis de la asociación entre el síndrome de Guillain-Barré y la infección por virus SARS-CoV-2, como ya ha sido documentado por otros autores[4,5].

La interpretación de la PCR negativa debe hacerse con prudencia, en especial ante un cuadro clínico no habitual, pero con datos clínicos y epidemiológicos de alta sospecha. Una toma inadecuada de la muestra, retraso en el transporte, error pre-analítico en el etiquetado de la muestra a lo largo del proceso o poca eliminación de virus por el paciente por el estadio del proceso, son causas posibles de falsos negativos que debemos tener presente.

Financiación

Este trabajo no ha recibido ningún tipo de financiación.

Conflicto de intereses

Los autores declaran no tener ningún conflicto de intereses.

Bibliografía

1. Wijdicks EFM, Klein CJ. Guillain-Barre Syndrome. Mayo Clin Proc. 2017;92:467–79.
2. Baig AM, Khaleeq A, Ali U, Syeda H. Evidence of the COVID-19 Virus Targeting the CNS: Tissue Distribution Host-Virus Interaction, and Proposed Neurotropic Mechanisms. ACS Chem Neurosci. 2020;11:995–8.
3. Mao L, Wang M, Chen S, He Q, Chang J, Hong C, et al. Neurological Manifestations of Hospitalized Patients with COVID-19 in Wuhan China: a retrospective case series study. SSRN J. 2020, http://dx.doi.org/10.1101/2020.02.22.20026500.
4. Zhao H, Shen D, Zhou H, Liu J, Chen S. Guillain-Barré syndrome associated with SARS-CoV-2 infection: casuality or coincidence? Lancet Glob Heal. 2020;4422:2–3.
5. Baldanti F, Daturi R, Postorino P, Cavallini A, Micieli G. Guillain - Barré Syndrome Associated with SARS-CoV-2. N Engl J Med. 2020:1–3.

A. Esteban Molina[a,*], M. Mata Martínez[a], P. Sánchez Chueca[a], A. Carrillo López[a], I. Sancho Val[a] y T.A. Sanjuan-Villarreal[b]

[a] *Servicio de Medicina Intensiva, Hospital Universitario Miguel Servet, Zaragoza, España*
[b] *Servicio de Anestesiología y Reanimación, Hospital Universitario Miguel Servet, Zaragoza, España*

[*] Autor para correspondencia.
Correo electrónico: a.estebanmolina@hotmail.com (A. Esteban Molina).
0210-5691/ © 2020 Elsevier España, S.L.U. y SEMICYUC. Todos los derechos reservados.

https://doi.org/10.1016/j.medin.2020.04.015

Sharing a single ventilator (''In vitro'')

Compartir un ventilador (''In vitro'') para dos pacientes

One of the main current difficulties that all intensivist is facing during this pandemic crisis is the lack of ventilators around the world. Some institutions have begun to use all resources available to face unprecedented ethical decisions in the developed countries such as direct palliative routes. Sharing a ventilator is technically possible and has been tested only in controlled, experimental models using test lungs or animals for brief periods.

In 2006 Greg Neyman and Charlene Babcock Irvin and Paladino[1–2] described how a single ventilator may be quickly modified to ventilate four simulated adults for a limited time. However, in each instance, Branson, Rubinson, and others have cautioned against the use of this technique.[3–5] As pointed out by six organization including the Society of Critical Care Medicine and the American Society of Anesthesiologists, there are significant technical challenges that must be overcome.[6] Such a strategy should only be considered as an absolute last resort, judged against the alternatives of long term ''hand bagging'' or death.[7] However, we do know that many institutions are evaluating this practice, and protocols are being developed and tested, and in some places, preliminarily implemented in major cities, such New York has been using it since almost the beginning. On March 24, 2020, The Food and Drug Administration (FDA), granted an Emergency Use Authorization for modifications of a host of ventilator-type devices to be used during the COVID-19 pandemic.[8]

The novel idea was not initially conceived to ventilate ARDS/COVID19 patients. In the last several past weeks, we modified and tested this system (''in vitro'') at King's College Hospital NHS Trust Foundation, to be able to ventilate two patients with a standard ICU ventilator.

Two sets of standard ventilator tubing (Hudson) were connected to a single ventilator (tested in each model of a ventilator, Puritan-Bennett, 840 series and a Servo I Maquet) via two ''T-tubes'' (one on the patient inflow limb of the circuit, and one on the patient exhaust limb). Each ''T-tube'' was attached to a microfilter (total of four) to isolated both patients and the ventilator (Figure 1). Finally, a heat and moisture exchanger (HME) filter was placed for each patient to provide heating and humidification (Figure 2).

Figure 1 Two sets of standard ventilator tubing (Hudson) were connected to a single ventilator (tested in each model of ventilator, Puritan-Bennett, 840 series and a Servo I Maquet) via two T-tubes (one on the patient inflow limb of the circuit, and one on the patient exhaust limb). Each T-tube was attached to a microfilter (total of four) to isolated both patients and the ventilator. Especially if the circuit do not have in place non-return valves.

One of the clear advantages with pressure-control ventilation, it is that in the case of a change in the respiratory mechanics of one patient, the second is not affected and there is less dependence on ideal body weight, sex and the compliances of the lung. Also, with a flow/pressure sensor to measure the expiratory tidal volume (VTe), the inspiratory peak and mean airway pressures, with the capnography placed, at least in one patient, the monitoring and safety increase considerably. Other variants with extra features and potential better improvements have been also released recently by colleagues around the world, but we must declare that we have not tested these variations in our laboratory.

We are aware that there are no available randomised control studies to support this approach with full guarantees, however, in our current times where the professional is taking ethical decisions extremely difficult it may be considered as a good alternative as ''compassionate treatment'' or as a ''bridge'' for the time being.

Figure 2 Heat and moisture exchanger (HME) filters were placed for each patient to provide heating and humidification as well as, a flow and pressure sensor and capnograh, at least in one of the two connections to increase the level of monitoring and safety.

Declarations section

Ethics approval and consent to participate: ''Not applicable''.

Consent for publication: ''Not applicable''.

Author Contributions

S. R. V was the main study ''in vitro'' researcher and who draft the manuscript.

Funding

Financial support, including any institutional departmental funds, was not sought for the study.

Conflict of interests

All faculty and staff who are in a position to control or affect the content of this paper have declared that they have no competing financial /commercial interests at all.

Acknowledgements

Harvey Kelleway and Jonathan Saka technicians at King's College Hospital NHS Trust Foundation for their time and input.

Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at doi:10.1016/j.medin.2020.04.021.

Bibliografía

1. Neyman G, Irvin C. A single ventilator for multiple simulated patients to meet disaster surge. Acad Emerg Med. 2006;13:1246–9.
2. Paladino L, Silverberg M, Charchaflieh J, et al. Increasing ventilator surge capacity in disasters: ventilation of four adult-human-sized sheep on a single ventilator with a modified circuit. *Resuscitation*. 2008;77:121–6.
3. Branson R, Blakeman T, Robinson B, Johannigman J. Use of a single ventilator to support 4 patients: laboratory evaluation of a limited concept. Respir Care. 2012;57:399–403.
4. Branson RD, Rubinson L. A single ventilator for multiple simulated patients to meet disaster surge. Acad Emerg Med. 2006 Dec;13:1352–3, author reply 1353-1354.
5. Branson RD, Blakeman TC, Robinson BR, Johannigman JA. Use of a single ventilator to support 4 patients: laboratory evaluation of a limited concept. Respir Care. 2012 Mar;57:399–403.
6. The Society of Critical Care Medicine (SCCM), American Association for Respiratory Care (AARC), American Society of Anesthesiologists (ASA), Anesthesia Patient Safety Foundation (APSF), American Association of Critical-Care Nurses (AACN), and American College of Chest Physicians (CHEST) issue this consensus statement on the concept of placing multiple patients on a single mechanical ventilator. March 26, 2020.
7. Recommended Strategies from the U.S. Public Health Service to Optimize Provision of Mechanical Ventilation. Point number 8 of the document. March 30, 2020.
8. U.S. Food and Drug Administration. Emergency Use Authorization [cited Mar 24, 2020]. Available at: https://www.fda.gov/media/136423/download.

Sancho Rodríguez-Villar[a,b,*]

[a] *Department of Critical Care, King's College Hospital NHS Trust Foundation. London, United Kingdom*
[b] *Honorary Senior Clinical Lecturer in the GKT School of Medical Education, Faculty of Life Sciences & Medicine at King's College London. London, United Kingdom*

[*] Consultant in Intensive Care Medicine, King's College Hospital NHS Trust Foundation, London. UK.
E-mail address: sancho.villar@nhs.com

0210-5691/ Crown Copyright © 2020 Published by Elsevier España, S.L.U.

https://doi.org/10.1016/j.medin.2020.04.021

Decisiones en UCI basadas en la estrategia *Living Systematic Review* durante la pandemia de SARS-CoV-2. Resultados de una serie prospectiva de casos

ICU decision making based on Living Systematic Review strategy during SARS-CoV-2 pandemic. Results of a prospective case serie

Sr. Editor:

La pandemia de SARS-CoV-2 ha generado una gran dificultad para la toma de decisiones en UCI debido a la escasez de estudios primarios finalizados y a que la mayoría de los resultados preliminares disponibles son retrospectivos. Por estas razones, coincidimos con Santillán-García[1] en que la *Living Systematic Review* (LSR), o «evidencia viva», puede ser una buena estrategia para mejorar la toma de decisiones en UCI durante situaciones como la actual. Definida por Elliot et al.[2] en 2014, la LSR consiste en la actualización constante de las revisiones sistemáticas incorporando nueva evidencia relevante a medida que está disponible.

Presentamos nuestra serie de casos, recogidos prospectivamente, en la que se muestran los resultados de la aplicación de esta metodología para la toma de decisiones clínicas durante la pandemia.

En nuestro hospital, un centro privado cooperativo sin ánimo de lucro dotado de 250 camas, se constituyó en febrero de este año el grupo de trabajo Hospital de Barcelona *Covid Decision Making* (HB-Covidem), que, con antelación al primer caso de COVID-19 y empleando la metodología de la *Guidance for the production and publication of Cochrane living systematic review*[3], elaboró un panel de «recomendaciones abiertas». Debido a la escasez de estudios primarios finalizados, los documentos de consenso[4], las guías de práctica clínica y las revisiones sistemáticas se fundamentaban más en inferencias de otros contextos clínicos que en evidencia relevante. Por esta razón sus recomendaciones debieron ser actualizadas a diario con fuentes más ágiles, convenientemente depuradas, como las publicaciones *online* de resultados preliminares o los *preprints* de SSRN y medRxiv, así como con los registros aún no publicados del canal Twitter @CovidNma. El objetivo de estas recomendaciones abiertas fue el apoyo a los profesionales clínicos de una manera ágil y eficaz, pero sin perder de vista que las directrices necesitan revisiones y actualizaciones continuas en función de la situación epidemiológica y los posibles cambios en las opciones terapéuticas[5,6].

El equipo multidisciplinario de UCI aplicó las opciones terapéuticas disponibles tras el análisis individualizado de cada paciente ingresado por neumonía COVID-19. Las decisiones se actualizaron dos veces al día durante las sesiones clínicas conjuntas de intensivistas, anestesiólogos y enfermeras: a las 9:00 h y a las 21 h. Las decisiones incluyeron tanto opciones sobre los fármacos del paquete de medicamentos *off-label* disponible como la selección de las técnicas de oxigenoterapia o de ventilación mecánica.

Se empleó la herramienta informática *Intellivue Clinical Information Portfolio* (ICIP)[7] para el registro y la validación de la serie de casos prospectivos y consecutivos con COVID-19 confirmados por el laboratorio y remitidos para ingreso en la UCI o bien por el centro coordinador del *Sistema d'Emergències Mèdiques*, o bien por otros servicios del hospital. Se recopilaron los datos demográficos y clínicos, incluyendo datos sobre complicaciones y mortalidad. El estudio contó con la aprobación, tanto en sus