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Editorial

Adaptation to Home Mechanical Ventilation: Is Time More Crucial Than Place?

Adaptación a la ventilación mecánica domiciliaria: ¿importa más el tiempo que el entorno?

Is it worth spending several days hospitalized, in stable condition, just for one or two hours of adaptation to home mechanical ventilation (HMV) during the day and a trial at night? This question should be considered through the perspective of both the patients and the healthcare organizations, considering factors such as reimbursement policies, infrastructure and experience of the clinical team, patient support network and distance from the hospital.

Initiation and patient adaptation to HMV in stable patients has progressively been moving from the traditional gold standard of inpatient setting to the outpatient and home settings, due to growing number of patients, healthcare resource limitation and increasing evidence of its non-inferiority, although each strategy has its specificities, advantages and drawbacks.[1]

With the growing technologic development, most recent randomized controlled trials (RCTs) in ambulatory models have focused on the impact of telemedicine-supported home adaptation to HMV and the use of automatic modes for outpatient initiation.[2–4]

Even though outpatient initiation is common in many healthcare settings, there are few RCT on this topic and none in patients with COPD.[4–7] In Portugal and Spain, for many years, most stable patients have been safely adapted in the outpatient setting with limited monitoring.[8] Also, studies from France, Italy, Australia and the UK have shown the outpatient initiation to be safe, effective, well accepted by patients and leading to similar effects in health-related quality of life (HRQoL) and a reduction in waiting time when comparing to inpatient adaptation.[4,9,10] A Spanish uncontrolled study that included patients with COPD described the effectiveness and cost reduction of the outpatient strategy.[11] Recently, a prospective study showed that the outpatient setting in patients with severe stable COPD was safe and effective (median adherence of 6.5 h, significant improvement in pCO_2), led to a significant improvement in HRQoL (above the proposed MCID of 5 points) at 3 months and was perceived as positive experience by the patients.[12]

An important limitation of these studies is that they are highly dependent on the healthcare local organization and team expertise and, therefore, are rarely international and their results cannot be generalized. To date there is no study directly comparing the three settings for adaptation or evaluating mixed models. For instance, what role can telemedicine play in facilitating outpatient initiation?

One can hypothesize that all strategies might be equally effective for most patients with experienced teams, adequate patient selection and clearly defined goals and monitoring tools. Some patients, such as decompensated comorbidities or complex care needs, will probably still need inpatient or laboratory titration. Also, patients who fail hospital adaptation or present issues during the process – such as uncontrolled leaks, obstructions, or significant asynchronies – may require monitoring in a sleep laboratory or hospital admission.

But more than the place and setting, one could argue that the most important variable would be time.

First, it is important to consider a strategy that avoids delays in initiation, as these can significantly impact patient outcomes. Ambulatory models have been shown to be more effective in achieving timely initiation.[9]

Second, one should also take into consideration the time needed for titration. The definition of initiation period is not clear – when we consider an elective impatient adaptation, we would probably consider that the initiation period corresponded to the number of days the patient is in the hospital for titration of parameters. However, both outpatient and home models are usually based in longer periods for titrating allowing for more slow and progressive parameter changes. Even though, it has been proven the advantages of a strategy aiming for normocapnia, it is unknown how rapidly should we try to correct hypercapnia.[13] In fact, excessively rapid correction of severe chronic hypercapnia may lead to obstructions and asynchronies due to instability of the respiratory centre.[14] In patients with home initiation, IPAP was gradually increased in the follow up period and adherence at 3 months was higher than the inpatient group, suggesting that a slower progressive upward titration may be best tolerated by patients.[2] A study in patient experience shown that around half of the patients needed between some days up to 3 months to feel they were adapted to the equipment.[10]

Third, the healthcare teams must allocate time for patient and caregiver education about how to properly use, maintain and resolve minor issues related to HMV, such as correction of leaks. We must consider the challenges specific to HMV our patients face such as changes in day-to-day life, potential reduction of work and leisure time, dealing with side-effects, the potential dependence on an external machine and implications in their family dynamics. It is also fundamental to allow time to discuss goals of treatment and advance care planning. This will be best performed in a calm

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and familiar environment and probably will need multiple interventions, which might be difficult in the inpatient setting.[2,10]

And finally, all the previously discussed points impact the most important "time issue" which is the time the patients need to be on therapy for attaining meaningful outcomes. It is well recognized that successful HMV is highly dependent on daily adherence to treatment.[15] Efforts to promote patient tolerance and adherence to treatment demand close monitoring of treatment and adjustments in time, due to exacerbation, unstable comorbidities or disease progression.

In the era of precision medicine, why can't we personalize the clinical pathway for initiating HMV? Variables such as the underlying disease and comorbidities, patient autonomy and social support, distance to the hospital, patient preferences, clinical team expertise, access to telemedicine monitoring tools, and reimbursement conditions could all be taken into consideration.

We must also define the key outcomes and performance indicators for future studies. Should we move beyond non-inferiority analyses and focus instead on cost-effectiveness or patient-reported outcomes such as HRQoL and patient experience? Reaching a consensus on what constitutes successful home mechanical ventilation initiation – and when it should be assessed – is not just a clinical need, but a cornerstone for advancing patient-centered care.

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Conflict of interest

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