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EDITORIAL

Can we predict the duration of the decannulation process?☆

¿Podemos predecir la duración del proceso de decanulación?

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Tracheotomy is one of the most frequent surgical procedures in critically ill patients. Up to 10% of all individuals who require mechanical ventilation for at least three days will need a tracheotomy for prolonged ventilation or for adequate management of the airway.[1] However, despite the widespread use of the technique and the abundant literature on the subject, few references to decannulation can be found.

Decannulation starts when mechanical ventilation and airway protection measures are no longer needed. However, patients recently weaned from prolonged ventilation and who remain tracheotomized are susceptible to muscle fatigue and to other sources of respiratory difficulty, as well as to other complications related to the tracheostoma itself. Decannulation is an important process in the recovery of the critical patient, but excess concern among clinicians in avoiding decannulation failure among patients with such vulnerabilities tends to excessively delay the procedure.

Some studies have found the mortality rate among tracheotomized patients discharged to the hospital ward with the cannula in place to be greater than among those patients who remain in the Intensive Care Unit (ICU) until closure of the tracheostoma.[2–5] A more recent analysis[6] contradicts these data, though the risk among tracheotomized patients in conventional hospital wards appear clear, due to lesser vigilance and a lack of training of the healthcare personnel in management of the tracheostoma.[7] A prospective study[8] found decannulation failure in the ward to affect a small proportion of patents, and particularly in the first 24 h of admission. The study found most patients to require reintroduction of the tracheotomy cannula due to the retention of secretions or breathing difficulties—this underscoring the importance of close monitoring at least during this initial period.

The variables usually employed in considering decannulation are level of consciousness, the production of secretions, the effectiveness of cough and oxygenation. Nevertheless, there is important clinical variability in this process, conditioned by the specific characteristics of each Unit and clinician subjectiveness, due to the lack of objective criteria for predicting decannulation success.[9]

In the present issue of Medicina Intensiva, Hernández et al.[10] publish the results of a prospective study designed to predict decannulation time based on the indication of tracheotomy. They included 173 patients subjected to tracheotomy and divided them into two groups: tracheotomized due to prolonged mechanical ventilation or prolonged weaning (group 1), and patients tracheotomized because of neurological damage or incapacity to manage the respiratory secretions (group 2). The authors applied a weaning and decannulation protocol, and performed multivariate Cox regression analysis to assess the influence of the predictors upon the response (time from weaning to decannulation). These predictors were found to differ between the two groups. Specifically, the factors associated to decannulation time in group 1 were patient gender, age, frequency of aspirations, forced vital capacity and spontaneous peak expiratory flow, while in group 2 the identified

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factors were the Glasgow coma score, the frequency of aspirations and swallowing. No variables with predictive capacity in the global patient series were identified, however.

Few studies have addressed this subject. Of the articles that can be found in the literature, some evaluate survival among patients discharged to the ward with the cannula in place,[3–6] others focus on evaluation of the determinants of decannulation,[9,11] and one study[12] explores predictors of decannulation success. The work of Hernandez et al.[10] belongs to this interesting line of research in which the body of evidence is practically inexistent. However, the study has some important limitations, including a small sample size, conduction of the study in only two Units, the development of a model based on an excessively conservative protocol, and the obtainment of results that are scantly applicable to the practical setting because of the design and construction of the model used.

The protocol considers patients not amenable to decannulation to be those subjects remaining in the ICU for more than 120 days after definitive weaning from mechanical ventilation—the failure rate when performing decannulation in such cases being 0%. It is hard to accept keeping a patient in the ICU for more than 120 days without the need for ventilatory support, and with tracheobronchial hygiene through the tracheostoma as the only justification for occupying a critical care bed. On the other hand, the fact that there were no decannulation failures suggests that too much time was spent in decannulating the patient, and that some patients therefore could have been decannulated earlier.

Regarding construction of the model, the classification of the patients based on the two established groups may have complicated assignment (in fact, the authors identified 12 patients that could have been included in either group). A more global and generalizable model therefore should have been sought. The dependent variable should have been more clearly defined; no explanation has been provided of the criterion used to establish the cutoff points for developing the model; and lastly the results lack key information for clarifying their practical significance. These considerations define the present study as being of relevance in that it opens an interesting field for research with larger samples and a more rigorous methodological design. It is not easy to design studies in this sense, though the availability of predictive tools could contribute to improve decannulation agility—thereby favoring the decannulation of a larger number of patients in the ICU.

Due to the total lack of evidence in this respect and the subjectiveness with which decannulation is carried out in a setting with as few resources as Intensive Care, decannulation in many cases cannot be carried out in the ICU. Consequently, a variable number of patients—depending on the center involved—are discharged to the ward with the cannula in place. It is therefore also important to generate strategies for correct management in the ward, with a view to guaranteeing optimum care of tracheotomized patients, as evidenced a few years ago by the tracheotomy assessment teams, which were able to shorten both decannulation time and hospital stay.[13,14]

In sum, there presently are no models allowing us to predict either the duration of the decannulation process or its success. Given the lack of such instruments, the current strategies should focus on the design of protocols combining agility in patient decannulation in the ICU with safety in the care and management of tracheotomized patients in areas outside the ICU, based on personnel training or the creation of teams applying such control. These measures could result in lesser patient morbidity—mortality and in economic savings produced by shorter hospital stays.

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