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Patient/ventilator asynchrony: does it matter for the patient or the ventilator?

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In this issue of *Minerva Anestesiologica*, Bruni *et al.* have published a review of patient/ventilator asynchrony in adult critically-ill patients.¹ The review is as exhaustive as didactic, reporting findings from 62 studies in invasive and non-invasive ventilation, without forgetting to very well describe the different types of asynchrony and their complex features. Surprisingly, the authors started saying that “patient-ventilator asynchrony is considered a major clinical problem for mechanically ventilated patients” but concluded that “it remains unclear whether: 1) asynchronies really affects patient outcome, and 2) the relationship between asynchronies and outcome is causative or associative.” Indeed, the data they reported regarding outcomes went in either way, for both “*a-priori*” classified “major” asynchronies (ineffective-triggering, auto-triggering, double-triggering) and “minor” asynchronies (premature and prolonged cycling). The association between asynchronies and outcomes is complex. The severity of illness can be associated with asynchronies because of the severity of lung disease or a greater ventilatory demand induced by stress response, metabolic acidosis or sepsis. In the other hand, asynchronies might induce some injuries via a mechanical stress on both lungs and diaphragm. This has been suggested especially for “double” triggering, an asynchrony responsible for a “double” tidal-volume that contrasts with the objectives of

protective ventilation.² Moreover, outcomes associated with asynchronies could be determined by the strategy implemented by the team itself. A study reported that nurses and residents were more prompt to increase sedatives/analgesics to manage asynchrony while senior physicians tried to modify the ventilator setting, the latter being much more effective.² We could retain that when a patient has some asynchronies in assist-control-ventilation, especially double-triggering and ineffective-triggering, the first thing to try is to simply switch to pressure-support-ventilation rather than increasing sedatives/analgesics. This strategy, when possible, avoids the need for a greater sedation and moves further away to ventilator weaning, patient’s recovery and discharge.^{2, 3} Increasing sedatives/analgesics rather than improving the ventilator setting may explain that deep sedation is associated with mortality in many studies, even after multiple adjustments on patient characteristics and illness severity.⁴ One major characteristic that has never been assessed in studies evaluating the relationship between sedation and mortality is the presence or absence of asynchronies.⁴ Similarly, studies evaluating the relationship between asynchronies and mortality did not report the sedation practices.^{1, 5} Finally, but first and foremost, if the causative effect of asynchrony on outcomes cannot be proved today, before increasing sedatives/analgesics, why not ask the patients about

their wish? As reported in the review by Bruni *et al.*,¹ asynchronies may be associated with discomfort in some patients but not all. Dyspnea (or respiratory suffering) accounts for the five most frequent and important stressors reported by critical care survivors.⁶ It is poorly recognized by physicians and nurses.⁷ However, new tools have been developed to better recognize dyspnea in mechanically-ventilated patients able to communicate⁶ or unable to communicate.⁸ Again, a better setting of the ventilator has been associated with a decrease in dyspnea intensity and related anxiety without the use of sedatives.⁹ Similarly, many efforts have been made to improve pain management in the critically-ill patients for the past decade.¹⁰ Assessing pain in critically-ill patients was highly challenging but tools have been constructed and validated then implemented in routine care successfully. It allowed for improving analgesia and lightening sedation, resulting in decreasing the duration of mechanical ventilation and length of stay in hospital. But first and foremost, it allowed for decreasing our patients' pain and suffering. In conclusion, it is not possible today to answer the questions whether the relationship between asynchronies and outcomes really exists and if it is causative or associative. However, it is time now to check whether asynchrony is associated with respiratory suffering or not and treat it, because as for pain, alleviating respiratory suffering is a fundamental right for critically-ill patients.¹¹

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Conflicts of interest.—Gérald Chanques has been a consultant for and has received honoraria from Orion Pharma and Aspen Medical France. Samir Jaber has been a consultant for and has received honoraria from Dräger, Xenios, Medtronic, and Fisher Paykel.