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Increases in B-type natriuretic peptide for detecting weaning-induced heart failure: reply to Liu et al.

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Dear Editor,

We thank Liu et al. [1] for their comments on our study published in your journal [2] and would like to clarify the points raised.

First, it is important to keep in mind that our study aimed to predict and diagnose the onset of heart failure (HF) during a spontaneous breathing trial (SBT). HF was *predicted* by determining *BNP before* the SBT (baseline $BNP > 263$ ng/l, accuracy 68%), while HF was *diagnosed* during the SBT based on the *changes in BNP* ($\Delta BNP > 48$ ng/l, accuracy 88.9%).

Second, the use of non-invasive ventilation (NIV) certainly reduces the need for reintubation by 16% [3], but only in a selected group of patients at risk of postextubation respiratory failure. In our study ten patients were reintubated, but only five could be considered “at risk” [3]. This means that less than one patient would have benefited from the prophylactic use of NIV. We do not therefore consider that this bias alters the interpretation of our results.

Third, we agree that our SBT failure rate (32%), albeit within the range described in other studies [4], may seem high, especially compared with that of Segal et al. [5] (19%). This

discrepancy, however, could be due to differences in populations. In our study the mean days of mechanical ventilation (MV) prior to SBT in patients who failed was 10 days, whereas in Segal’s study it was 6 days. This suggests that a greater proportion of patients in our study had weaning defined as difficult according to the international consensus conference [6].

In reply to the next point, we did not study mortality in our study. However, we observed that patients who failed their first SBT due to HF had a longer duration of MV and ICU stay. Predicting (*baseline BNP*) the onset of HF caused by the SBT allows for prompt treatment, possibly reducing the days of MV. A $\Delta BNP > 48$ ng/l during SBT is a non-invasive *diagnostic* indicator of HF, available 24 h a day.

To answer Liu et al.’s question, we would like to point out that we did not analyze the following SBTs, so we do not possess any data that allow us to elucidate to what extent the patients may have benefited from diuretic and vasodilator treatment.

Lastly, regarding their suggestion to combine analysis of HF at the end of the SBT with that appearing in the next 48 h after extubation, we consider such an approach would be erroneous for the following reasons. First, the two groups were not homogenous as the timing between blood tests was shorter in the patients failing the SBT than in the patients requiring reintubation within 48 h. Second, after succeeding in the SBT trial and until reintubation was necessary, patients requiring reintubation were on therapies that could alter natriuretic peptide concentrations. Third, the disease under study is HF during SBT. Therefore, even extubated patients that were reintubated because of HF should be considered “disease absent” (D–). Analysis of these patients would require a specific study design.

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