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The authors reply

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► **To cite this version:**

Audrey de Jong, Samir Jaber. The authors reply. *Critical Care Medicine*, 2018, 46 (11), pp.e1082-e1083. 10.1097/CCM.0000000000003390 . hal-01894965

HAL Id: hal-01894965

<https://hal.umontpellier.fr/hal-01894965v1>

Submitted on 9 Jan 2020

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The authors reply:

We read with interest the comments of Tanabe et al (1) regarding our article (2) recently published in *Critical Care Medicine*.

Tanabe et al (1) raised three concerns in relation to our study (2). We understand their comments but disagree with their conclusions.

First, they stated that the method of preoxygenation was unclear. However, in the Supplemental Table 2 in our study (2) entitled "Patient baseline, provider and practice characteristics", method of preoxygenation was pointed out: No difference between groups was found regarding the method of preoxygenation, noninvasive ventilation being performed for preoxygenation in 44% of cases (50% of cases in the group "intubation-related cardiac arrest" vs 44% of case in the group "No intubation related cardiac arrest"). Otherwise bag valve mask oxygen was performed, as high-flow nasal cannula oxygen was not implemented in the participating units when the patients analyzed in our study (2) were included. The absence of preoxygenation, versus the presence of preoxygenation irrespective of the method used, was an independent risk factor for intubation-related cardiac arrest in the final multivariate model presenting the risk factor related to cardiac arrest during intubation procedure.

Second, Tanabe et al (1) argued that the lowest peripheral capillary oxygen saturation (SpO_2) before intubation seemed to be very low compared with clinical practice (82% overall, 62% in the cohort with cardiac arrest). We disagree with this statement regarding clinical practice in ICUs, critically ill patients being often hypoxemic before intubation, and as specified "the lowest" SpO_2 and not "the average" SpO_2 were provided in Table 1 in our study (2). Moreover, the lowest SpO_2 values found in our study (2) were similar to the lowest SpO_2 values found in previous studies in the literature performed not only by our group (3, 4) but also by other groups: In the study of Corl et al (5), more than 50% of patients were hypoxemic before intubation. In the study of Simpson et al (6), almost 40% of patients had a SpO_2 before intubation lower than 90%, and 10% had a SpO_2 lower than 80%.

Third, Tanabe et al (1) underlined that the Sequential Organ Failure Assessment (SOFA) score was not included in the final multivariate model presenting independent risk factors for cardiac arrest during intubation despite its significance in univariate analysis. Actually, arterial hypotension prior to intubation, hypoxemia prior to intubation, lack of preoxygenation, overweight/obesity, and age of more than 75 years were found as independent risk factors for intubation-related cardiac arrest. Among these risk factors, three (arterial hypotension, hypoxemia, and age) were coupled with the SOFA score. We chose the most statistically appropriated model to predict intubation-related cardiac arrest, after assessment of calibration, discrimination, and relevancy. Residuals were plotted and the distributions inspected avoiding correlations between variables.

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