

CORRECTION



Correction: High arterial oxygen levels and supplemental oxygen administration in traumatic brain injury: insights from CENTER-TBI and OzENTER-TBI

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Correction: Intensive Care Medicine

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Figure 1 contained some incorrect colors of the representative country flags that are now corrected. Figure 3 was updated: we represented the interaction between PaO_{2max} and FiO_{2max} with mortality in both panels. Consequently, the Figure 3 caption was edited as follows: “Fig. 3. Tensor cubic spline for the interaction between PaO_{2max} and FiO_{2max} with GFAP. In panel A on the left, we represented the tensor cubic spline with 4 degrees of freedom each, used for the interaction between PaO_{2max} and GFAP in the multivariable logistic model with 6-month mortality as the outcome (i.e. model 2 of Table 2). In panel B on the right, we represented the tensor cubic spline with 4 degrees of freedom each, used for the interaction between FiO_{2max} and GFAP in the multivariable logistic model with 6-month mortality as the outcome (i.e. model 4 of Table 2). All other continuous covariates (i.e. Supplemental Table 6 and 10) were set to median values and mid-category for categorical ones.”

Table 2 was updated: model 4 - about the adjustment of FiO₂ levels with the degree of brain injury severity (i.e. log GFAP) - was reported. Consequently, Supplemental Tables 9 and 10 were added to provide full models with all confounders of model 4 – Table 2.

In the abstract (i.e. results section), the following sentence “GFAP was independently associated with mortality and functional neurologic outcome at follow-up, but it did not modulate the outcome impact of high PaO₂ levels, which remained independently associated with 6-month mortality.” was replaced with the following one: “GFAP was independently associated with mortality and functional neurologic outcome at follow-up, but it did not modulate the outcome impact of high PaO₂ and FiO₂ levels, which remained independently associated with 6-month mortality.”

In the introduction section, the third bullet point was revised as “3. evaluate whether the impact of high levels of oxygen exposure or high levels of supplemental oxygen on 6-month outcome could be worsened by increasing brain injury severity, as assessed by acute (first 24 h) serum levels of GFAP in the CENTER-TBI cohort.”

The labels of Figure 1, 2 and 3 were updated by adding the reference of the study cohort as follows: “Fig. 1 Center-specific median values of daily highest PaO₂ and FiO₂ in CENTER-TBI and OzENTER-TBI cohorts.” “Fig. 2 The model-based probability for mortality in CENTER-TBI.” “Fig. 3 Tensor cubic spline for the interaction between PaO_{2max} and FiO_{2max} with GFAP in CENTER-TBI.” In the legend of Figure 2 we replaced “Model 2” with “Model 1”.

In the results section (i.e. Center-TBI - Arterial oxygen levels and outcomes in TBI patients) the following sentence “We did not find any interaction between the

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studied variables, as shown in Fig. 3 (panels A and B), where the surfaces that represent the smoothed interactions (on a log scale) are mainly flattened on zero.” was replaced with the following one “We did not find any interaction between the studied variables, as shown in Supplemental Figure 4 (panel A) and Figure 3 (panel A), respectively, for PaO_{2max} - and both PaO_{2mean} and ΔPaO_{2mean} as well (data not shown) - where the surfaces that represent the smoothed interactions (on a log scale) are mainly flattened on zero.”

The caption of Table 2 was changed according to the updated Table 2, and the following sentence was added: “Model 4. Model 3 plus the degree of brain injury

quantified as GFAP levels.” The title of Table 2 has been updated as follows: “Table 2 Multivariable models on GOSE and mortality at 6-month follow-up in CENTER-TBI (Models 1, 2, 3 and 4)”.

In the results section (i.e. Center-TBI - Supplemental oxygen administration and outcome), the following sentence was added according to the inclusion of model 4 in the updated Table 2: “We also explored the role of exposure to high supplemental oxygen levels on the neurologic outcome by further adjusting the model for GFAP levels. GFAP was positively associated with a lower GOSE score and a higher mortality rate. No association was observed with GOSE among the variables

Table 2 Multivariable models on GOSE and mortality at 6-month follow-up in CENTER-TBI (Models 1, 2, 3 and 4)

CENTER-TBI	6-month GOSE N = 912 patients, 489 GOSE ≤ 4			6-month mortality N = 912 patients, 225 died		
	OR*	95% CI	p	OR*	95% CI	p value
Model 1						
PaO _{2max} (for 10 mmHg increase)	1.02	1–1.04	0.014	1.03	1.01–1.05	0.002
PaO _{2mean} (for 10 mmHg increase)	1.03	1–1.07	0.059	1.08	1.04–1.13	<0.001
ΔPaO _{2mean} (for 10 mmHg increase) ^b	1.07	1.03–1.12	0.001	1.14	1.08–1.20	<0.001
Model 2	6-month GOSE N = 764 patients, 407 GOSE ≤ 4			6-month mortality N = 764 patients, 175 died		
	OR*	95% CI	p	OR*	95% CI	p
Logarithm GFAP	1.51	1.33–1.71	<0.001	1.51	1.29–1.77	<0.001
PaO _{2max} (for 10 mmHg increase)	1.02	1–1.03	0.064	1.03	1.01–1.05	0.008
Logarithm GFAP	1.52	1.34–1.72	<0.001	1.52	1.3–1.78	<0.001
PaO _{2mean} (for 10 mmHg increase)	1.03	0.99–1.07	0.092	1.09	1.04–1.14	0.001
Logarithm GFAP	1.52	1.34–1.72	<0.001	1.53	1.3–1.81	<0.001
ΔPaO _{2mean} (for 10 mmHg increase)	1.05	1–1.11	0.031	1.14	1.08–1.21	<0.001
Model 3	6-month GOSE N = 877 patients, 470 GOSE ≤ 4			6-month mortality N = 877 patients, 212 died		
	OR***	95% CI	p	OR***	95% CI	p
FiO _{2max} (for 0.1 increase)	1.03	0.96–1.1	0.453	1.18	1.08–1.29	<0.001
FiO _{2mean} (for 0.1 increase)	1.02	0.92–1.14	0.694	1.31	1.13–1.51	<0.001
ΔFiO _{2mean} (for 0.1 increase)	1.03	0.84–1.27	0.761	1.46	1.13–1.88	0.004
Model 4	6-month GOSE N = 741 patients, 397 GOSE ≤ 4			6-month mortality N = 741 patients, 168 died		
	OR*	95% CI	p	OR*	95% CI	p
Logarithm GFAP	1.52	1.34–1.72	<0.001	1.55	1.31–1.83	<0.001
FiO _{2max} (for 0.1 increase)	1.03	0.96–1.12	0.389	1.20	1.08–1.33	0.001
Logarithm GFAP	1.52	1.34–1.72	<0.001	1.55	1.32–1.84	<0.001
FiO _{2mean} (for 0.1 increase)	1.04	0.93–1.17	0.498	1.33	1.13–1.55	<0.001
Logarithm GFAP	1.51	1.33–1.72	<0.001	1.55	1.31–1.83	<0.001
ΔFiO _{2mean} (for 0.1 increase)	0.98	0.78–1.23	0.846	1.40	1.05–1.87	0.023

* OR is for 10 mmHg increase in PaO₂ covariate ** 1 patient did not have low PaO₂ ***OR regards 0.1 increments in FiO₂ covariate

representing higher supplemental oxygen. However, all three high supplemental oxygen variables remained positively associated with a higher mortality rate (Model 4, Table 2). A detailed description of all confounders estimates is reported in Supplemental Tables 9 and 10.”

Additionally, in the results section (i.e. Center-TBI - Supplemental oxygen administration and outcome), the following sentence was added: “We explored the presence of interaction on GOSE and mortality between exposure to high FiO₂ levels and GFAP levels. We did not find any interaction among the studied variables, as shown in Supplemental Figure 4 (panel B) and in Figure 3 (panel B), respectively, for FiO_{2max} - and for both FiO_{2mean} and ΔFiO_{2mean} as well (data not shown) - where

the surfaces that represent the smoothed interactions (on a log scale) are mainly flattened on zero.” according to the updated Figure 3 that explored the presence of interaction between the study parameters (i.e. PaO_{2max} and FiO_{2max}) with mortality. The interaction between PaO_{2max} and FiO_{2max} with GOSE was evaluated in Supplemental Figure 4.

Supplemental Tables 9, 10, 11, 12, 13, 14, and 15 were renumbered as Supplemental Tables 11, 12, 13, 14, 15, 16, and 17.

The original article has been updated. The Authors apologize for the mistakes.

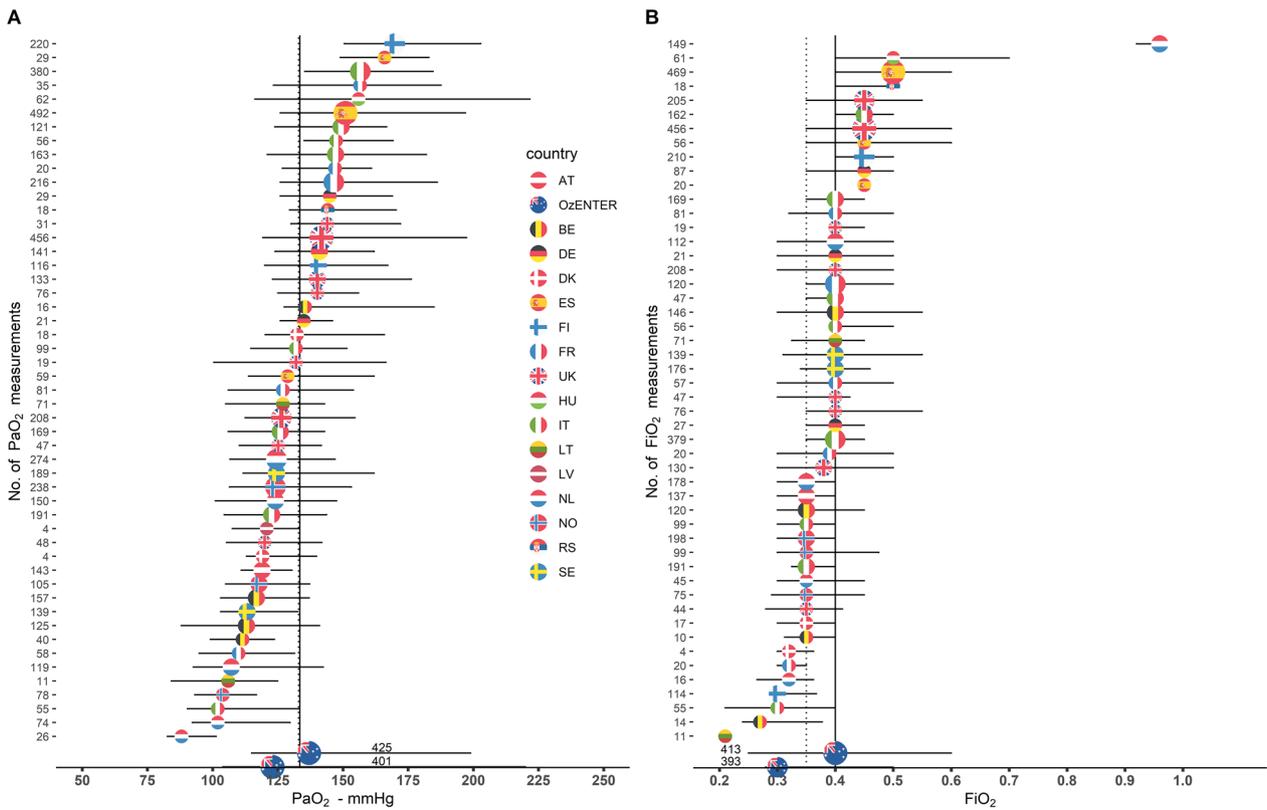


Fig. 1

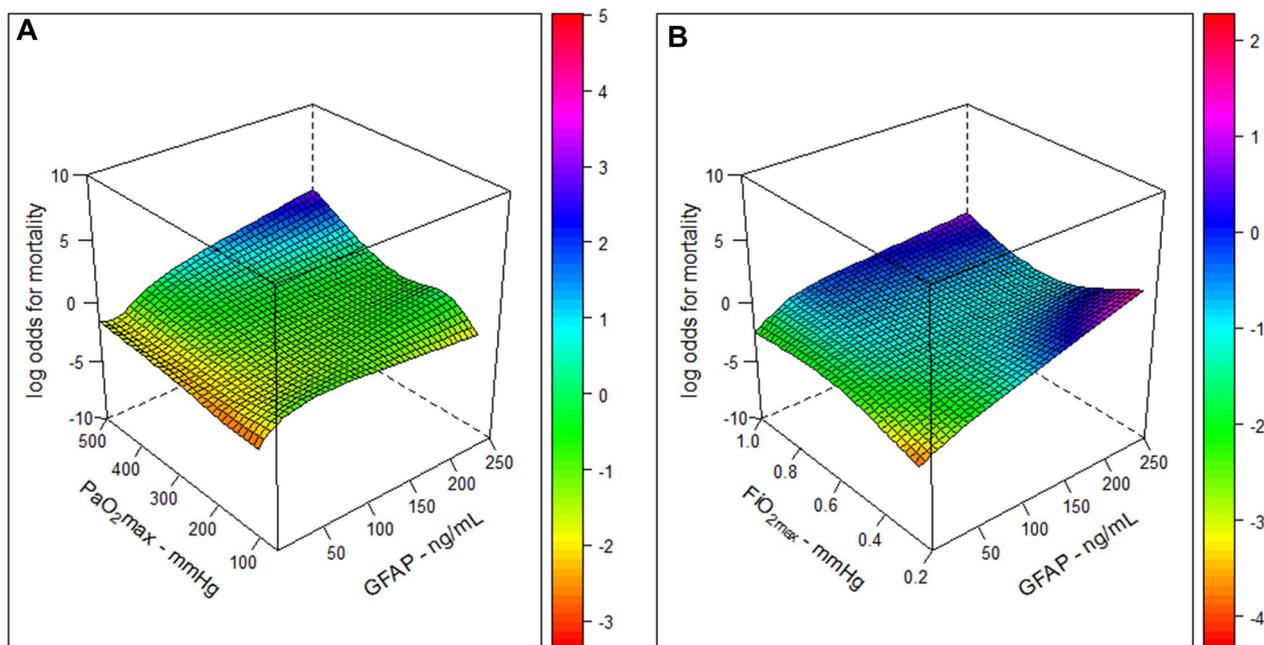


Fig. 3

Supplementary Information

The online version contains supplementary material available at <https://doi.org/10.1007/s00134-022-06924-6>.

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