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Letters to the Editor

Data Interpretation on the Use of Double-Lumen Tube (DLT) Versus Bronchial Blocker (BB) for One-Lung Ventilation

To the Editor:

With great interest we read the review article by Clayton-Smith et al on the use of double-lumen tubes (DLT) or bronchial blockers (BB) during one-lung ventilation (OLV).[1] Although we subscribe to the conclusions of this manuscript, we have noticed some irregularities in the data presented in the figures and forest plots of this article. In the columns of Figs 5, 6, 9, 10, and 11, the original data for BB and DLT seem to be mixed up. That is, the data for BB were most likely placed in the column for DLT and the other way around. If we repeat the meta-analysis regarding malpositioning of BBs versus DLTs (see Fig 6) with the data in the correct columns, we see a mirrored forest plot compared with the one in the article. The authors concluded that BBs are significantly more likely to be incorrectly positioned than are DLTs; however, their forest plot suggests the opposite. In addition, in the analysis depicted in Fig 7, it seems that the mean of the original data from the Narayanaswamy et al[2] study for BBs and DLTs have been switched.

Clayton-Smith et al are to be congratulated on including numerous studies in the analysis of "quality of lung collapse." However, regarding the data from the original publication from Mourisse et al,[3] one can see that Mourisse et al used a 4-point rating scale for the assessment of lung collapse (excellent/good/average/poor). When comparing the assessment scale values presented in the current meta-analysis, only the ratings of excellent/good/average seem to have been taken into account. Furthermore, we wonder which considerations were made to not include data from the study by Campos and Ueda[4] in the analysis mentioned in Fig 6 because the outcome data of interest for this analysis—malpositioning of the airway device—are available in that article.

In terms of the analysis for airway injuries demonstrated in Fig 11, we were not able to retrieve these data from the original study by Mourisse et al.[3] On the assumption that the authors requested additional information from the authors of the original articles,[3,5,6] it is advisable to mention this in the article.

Finally, for the analysis on sore throat and hoarseness, we would like to point out that the repeated use of the combined outcome for sore throat and hoarseness from the paper by Zhong et al[6] in the analysis depicted in Figs 9 and 10 might lead to an overestimation of a possible effect because it is not possible to distinguish between sore throat on the one hand and hoarseness on the other hand from the data presented by Zhong et al.

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Anne N. Huitema, BSc
Lena Koers, MD
Benedikt Preckel, MD, PhD
Department of Anesthesiology
Academic Medical Centre
Amsterdam, The Netherlands

Response to "Data Interpretation on the Use of Double-Lumen Tube Versus Bronchial Blocker for One-Lung Ventilation"

To the Editor:

With thanks we have received the letter from Dr. Preckel and colleagues entitled "Data Interpretation on the Use of Double Lumen Tube Versus Bronchial Blocker for One-Lung

http://dx.doi.org/10.1053/j.jvca.2015.12.010

Study or Subgroup	BBs Mean	BBs SD	BBs Total	DLTs Mean	DLTs SD	DLTs Total	Weight	Mean Difference IV, Random, 95% CI
Bauer 2001	191.85	77.2	16	135.6	33	15	17.2%	56.25 [14.90, 97.60]
Campos 1996	324	270	20	372	186	20	6.1%	-48.00 [-191.69, 95.69]
Campos 1998	252	84	20	324	174	20	11.3%	-72.00 [-156.68, 12.68]
Campos 2003	181.2	43.63	48	124.8	160.8	16	11.9%	56.40 [-23.35, 136.15]
Campos 2006	456	374.74	44	366	217.78	22	6.2%	90.00 [-53.32, 233.32]
Dumans-Nizard 2009	254.5	109.64	32	137	71.85	16	15.7%	117.50 [65.71, 169.29]
Knoll 2006	90	465.19	29	60	344.44	27	3.3%	30.00 [-183.41, 243.41]
Mourisse 2013	25	34.44	50	13	324.07	48	10.5%	12.00 [-80.17, 104.17]
Narayanaswamy 2009	203	132	78	93	62	26	17.7%	110.00 [72.24, 147.76]
Total (95% CI)			**337**			**210**	**100.0%**	**51.05 [8.48, 93.62]**

Heterogeneity: $Tau^2 = 2298.04$; $Chi^2 = 23.18$, df = 8 (P = 0.003); $I^2 = 65\%$
Test for overall effect: Z = 2.35 (P = 0.02)

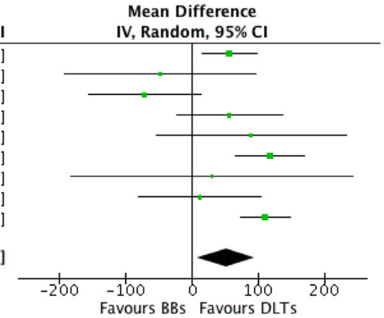

Fig 1. Time to placement of bronchial blocker compared with double-lumen endobronchial tube. Forest plot summarizing meta-analysis of the time taken to place bronchial blockers compared with double-lumen endobronchial tubes. The combined mean difference for all subtypes is represented by a black diamond where diamond width corresponds to 95% confidence interval bounds. Each study is shown with its 95% confidence interval. The size of the square symbol is proportional to the weight assigned to the study in the pooled estimate using a random effects model. BBs are significantly slower to place, but an I2 value of 65% indicated that heterogeneity is high. BB, bronchial blockers; DLT, double-lumen endobronchial tubes; SD, standard deviation; IV, independent variable; CI, confidence interval. (This figure modified from Fig 5 in original article.)

Study or Subgroup	BBs Events	BBs Total	DLTs Events	DLTs Total	Weight	Odds Ratio M-H, Random, 95% CI
Bauer 2001	9	16	2	15	10.3%	8.36 [1.40, 49.88]
Campos 1996	15	20	5	20	12.4%	9.00 [2.15, 37.66]
Campos 1998	5	20	3	20	11.4%	1.89 [0.38, 9.27]
Campos 2003	13	48	2	16	11.3%	2.60 [0.52, 13.04]
Campos 2006	0	0	0	0		Not estimable
Mourisse 2013	37	50	41	48	15.2%	0.49 [0.18, 1.35]
Narayanaswamy 2009	35	78	2	26	11.9%	9.77 [2.16, 44.21]
Ruetzler 2011	7	19	3	20	11.7%	3.31 [0.71, 15.44]
Zhong 2009	26	90	8	30	15.8%	1.12 [0.44, 2.83]
Total (95% CI)		**341**		**195**	**100.0%**	**2.70 [1.18, 6.18]**
Total events	147		66			

Heterogeneity: $Tau^2 = 0.91$; $Chi^2 = 20.44$, df = 7 (P = 0.005); $I^2 = 66\%$
Test for overall effect: Z = 2.34 (P = 0.02)

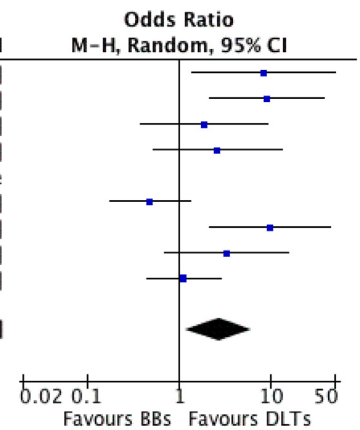

Fig 2. Frequency of malposition of bronchial blockers compared with double-lumen tubes. Forest plot summarizing meta-analysis of the incidence of malposition of bronchial blockers compared with double-lumen endobronchial tubes. Random effects analysis showed BBs are significantly more likely to be incorrectly positioned than DLTs, although heterogeneity of the analysis was high as measured by the I2. BB, bronchial blockers; DLT, double-lumen endobronchial tubes; M-H, Mantel-Haenszel; CI, confidence interval. (This figure modified from Fig 6 in the original article.)

Study or Subgroup	BBs Events	BBs Total	DLTs Events	DLTs Total	Weight	Odds Ratio M-H, Fixed, 95% CI
Knoll 2006	7	29	12	27	23.3%	0.40 [0.13, 1.24]
Mourisse 2013	3	47	11	45	26.1%	0.21 [0.05, 0.82]
Ruetzler 2011	9	19	9	20	11.4%	1.10 [0.31, 3.88]
Zhong 2009	17	90	13	30	39.2%	0.30 [0.12, 0.74]
Total (95% CI)		**185**		**122**	**100.0%**	**0.39 [0.23, 0.68]**
Total events	36		45			

Heterogeneity: $Chi^2 = 3.69$, df = 3 (P = 0.30); $I^2 = 19\%$
Test for overall effect: Z = 3.33 (P = 0.0009)

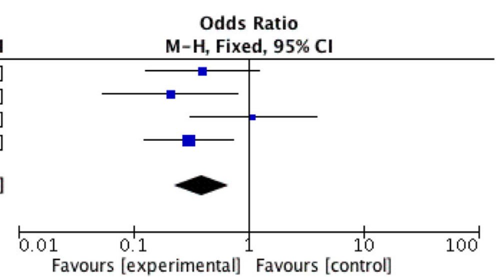

Fig 3. Incidence of sore throat after use of bronchial blockers compared with double-lumen endobronchial tubes. Forest plot of fixed-effect meta-analysis showing the incidence of sore throat was significantly less associated with bronchial blockers than double-lumen endobronchial tube with a low level of heterogeneity. BB, bronchial blockers; DLT, double-lumen endobronchial tubes; M-H, Mantel-Haenszel; CI, confidence interval. (This figure modified from Fig 9 in the original article.)

Ventilation." Please find here our responses to the points flagged by the aforementioned letter.

First, the data reported in Figures 5, 6, 9, 10, and 11 of the original article were placed in the incorrect columns. We have rectified this error and switched the data around. With the data now in the correct columns, the forest plots match the conclusions stated in the text. These updated figures can be seen here as Figures 1, 2, 3, 4, and 5A and 5B.

Dr. Preckel and colleagues were correct in noting that the data used in time taken to lung collapse (Fig 7) from the Narayanasway et al[1] paper had been entered into the wrong columns. After correcting this, the result changed from not significant (p = 0.39) to significant (p = 0.02) (Fig 7 [modified]). This demonstrated that double-lumen tubes show a significantly quicker time to lung collapse. However, this analysis still did exhibit an extremely high level of

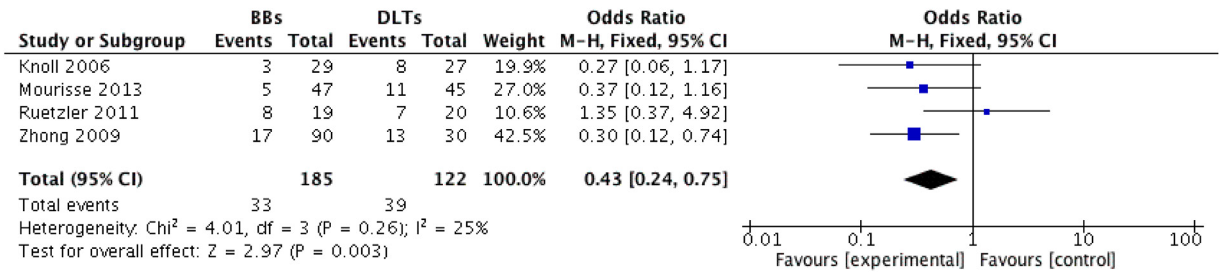

Fig 4. Incidence of hoarseness after use of bronchial blockers compared with double-lumen endobronchial tubes: Forest plot of fixed-effect meta-analysis showing the incidence of hoarseness was significantly less associated with bronchial blockers than double-lumen endobronchial tubes with a low level of heterogeneity. BB, bronchial blockers; DLT, double-lumen endobronchial tubes; M-H, Mantel-Haenszel; CI, confidence interval. (This figure modified from Fig 10 in the original article)

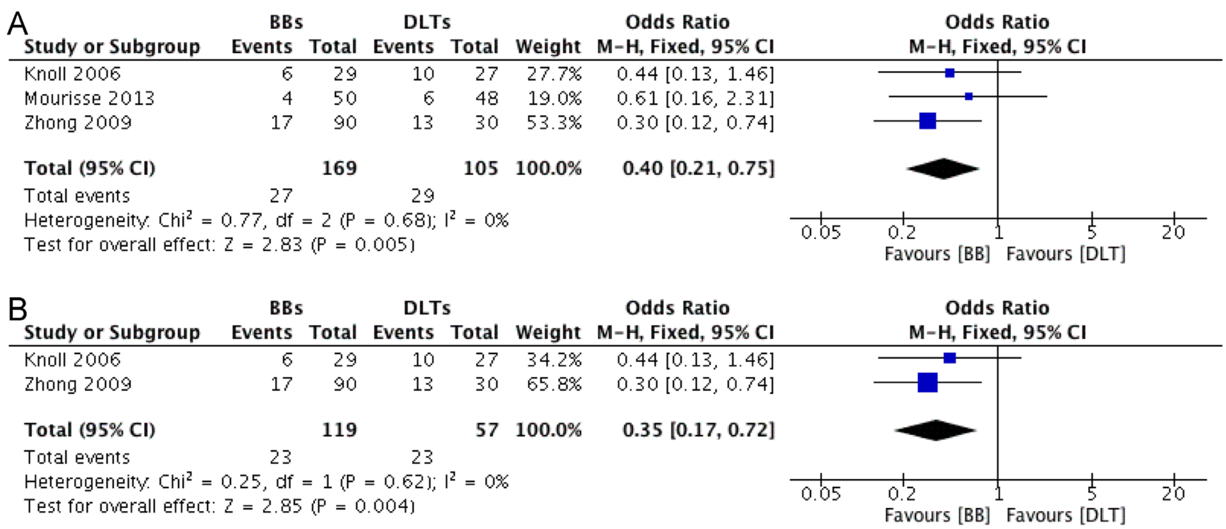

Fig 5. (A) Incidence of airway injury after use of bronchial blockers compared with double-lumen endobronchial tubes. Forest plot of fixed effect meta-analysis showing the incidence of airway injury was significantly less associated with bronchial blockers than double-lumen endobronchial tubes with no heterogeneity. BB, bronchial blockers; DLT, double-lumen endobronchial tubes; M-H, Mantel-Haenszel; CI, confidence interval. (This figure modified from Fig 11 in the original article.) (B) Incidence of airway injury after use of bronchial blockers compared with double lumen endobronchial tubes, not including the study by Mourisse et al due to unavailable raw data. Forest plot of fixed effect meta-analysis showing the incidence of airway injury was significantly less associated with bronchial blockers than double-lumen endobronchial tubes with no heterogeneity. BB, bronchial blockers; DLT, double-lumen endobronchial tubes; M-H, Mantel-Haenszel; CI, confidence interval. (This figure modified from Fig 11 in the original article.)

heterogeneity with $I^2 = 79\%$. Please find attached the correct forest plot to reflect this change.

In reference to the comparison of quality of lung collapse, for ease of analysis, we combined the average and poor groups in the Mourisse et al[2] paper. This meant that there were only 3 grades of lung collapse, allowing this paper to be directly compared to other studies, further increasing the breadth of the analysis.

We decided not to include the data from Campos et al[3] when examining frequency of malposition of the airway devices (Fig 6) as this study focused solely on obese patients, and we were worried this would affect the reliability of the data.

Regarding the data used from Mourisse et al[2] in Figure 11, the authors reported the incidence of many different types of airway injury both before and after surgery. The values used in Figure 11 were obtained by subtracting the number of preoperative airway injuries from the number of postoperative airway injuries and dividing by the number of outcomes measured. We accept that this may not be the most accurate way of reporting the absolute number of airway injuries, but we wanted to include as many papers as possible in the analysis to increase the statistical power of the results. However, if the Mourisse et al[2] study is removed from the analysis, we have established that it does not alter the significance of the result. The new p value would be 0.004. See Figure 11 both with and without the Mourisse data included (Fig 5A and 5B).

Unfortunately, the data for incidence of sore throat and hoarseness stated in the Zhong et al[4] study were reported collectively. We agree that this may lead to overestimation of possible effects, but despite efforts made to contact the author, we were unable to obtain the raw data to separate the 2 outcomes.

We thank the authors kindly for their rigorous analysis of our paper and hope we have provided sufficient answers to their queries.

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Ana Clayton-Smith, BMed Sci Hons
Timothy Hawthorne, BMed Sci Hons
College of Medicine and Veterinary Medicine
The University of Edinburgh
Edinburgh, United Kingdom

Use of Dexmedetomidine to Attenuate Myocardial Injury After Off-Pump Coronary Artery Bypass Grafting Surgery

To the Editor:

We read, with interest, the recent article by Chi et al[1] assessing the cardioprotective effect of dexmedetomidine in patients undergoing off-pump coronary artery bypass grafting (CABG) surgery. They showed that in a high-dose group, administration of a loading dose of dexmedetomidine, 1 μg/kg, before anesthesia followed by a continuous infusion of dexmedetomidine at a rate of 0.6-μg/kg/h before the end of surgery significantly reduced myocardial injury, as shown by decreased serum cardiac troponin I (cTnI) and creatine kinase MB (CK-MB) levels at 48 hours after surgery. Given that myocardial injury is associated significantly with morbidity and mortality after cardiac surgery, their findings have potential implications. In our view, however, there are several issues in this study that need to be clarified and discussed.

First, use of high-dose dexmedetomidine only reduced serum cTnI and CK-MB levels at 48 hours after surgery but did not decrease serum cardiac enzyme levels at 24 hours after surgery. Importantly, it was unclear how many patients in each group had a higher postoperative serum cardiac enzyme levels than the cutoff values of myocardial injury. Furthermore, the authors did not describe whether postoperative major adverse cardiovascular events, including myocardial infarction and death, were different among the groups. Thus, we cannot determine whether favorable effects of high-dose dexmedetomidine on postoperative cardiac enzyme levels can be translated to postoperative cardiovascular morbidity and mortality benefits. To address this issue, we agree with the authors that large-scale clinical trials still are required, and these new studies should have enough power for postoperative cardiovascular morbidity and mortality measurements.

Second, in this study, dexmedetomidine was only used for a short time from anesthesia induction to the end of surgery. This treatment regimen of dexmedetomidine may be inadequate to obtain a optimal cardioprotection. The available evidence shows that delayed postoperative myocardial infarction occurs 74 ± 39 hours after surgery, and myocardial infarction happens 54 ± 35 hours after the occurrence of the first abnormal postoperative cTnI level.[2] To obtain adequate perioperative cardioprotection, therefore, it is recommended that the dosage regimen of dexmedetomidine should assure an adrenergic blockade at least for 72 hours postoperatively and preferably longer.[3]

Third, this study only measured serum cTnI and CK-MB levels at 24 hours and 48 hours after surgery but not serum cardiac enzyme levels at the end of surgery. Furthermore, serum cardiac enzyme levels at 24 hours after surgery in all groups increased significantly compared with the baseline values and were not different among the groups. The available literature indicates that cTnI release as measured at the end of CABG surgery represents a strong predictor of an adverse outcome after surgery.[4] Among patients undergoing CABG surgery, elevation of CK-MB or troponin levels within the first 24 hours also has been associated independently with increased intermediate-term and long-term risk of mortality.[5] In addition, the authors did not specify whether the 3 groups were comparable with respect to early postoperative complications affecting serum cardiac enzyme release, such as low hemoglobin level, hypotension, low-output syndrome, new-onset atrial fibrillation, and deterioration of regional wall motion. Thus, it is difficult to differentiate that the decreased serum cardiac enzyme levels at 48 hours after surgery were attributable to use of high-dose dexmedetomidine.

Finally, both extubation time and intensive care unit length of stay were prolonged in the high-dose group. Evidently, this can increase the total cost of hospitalization. Thus, we believe that a cost-efficient ratio of using high-dose dexmedetomidine to provide perioperative cardioprotection in patients undergoing CABG surgery is an issue that needs to be addressed before adoption into routine practice.

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Gui-Zhen Yang, MD
Fu-Shan Xue, MD
Gao-Pu Liu, MD
Chao Sun, MD
Department of Anesthesiology, Plastic Surgery Hospital
Chinese Academy of Medical Sciences and
Peking Union Medical College
Beijing, China