POSTOPERATIVE NONINVASIVE VENTILATION IN PATIENTS UNDERGOING CORONARY ARTERY BYPASS GRAFTING: A SMALL STEP WITH GREAT REPERCUSSIONS To the Editor:

Commonly, anesthesia, postoperative pain, and surgery induce respiratory modifications (hypoxemia, pulmonary volume decrease, and atelectasis) associated with a restrictive syndrome.¹ In some cases, postextubation acute respiratory failure is a serious complication after coronary artery bypass grafting. The role of noninvasive ventilation (NIV) in the postoperative period is growing as an alternative therapy to avoid reintubation and associated complications¹; however, pulmonary complications and NIV interactions still show a complex interaction with preoperative or intraoperative procedures.

In their recent article, Al Jaaly and colleagues² compared 2 strategies in the postoperative period: bilevel positive airway pressure (NIV) and usual care with oxygen therapy. Major findings of this study were that there were no significant differences in intensive care stay, postoperative stay, mean percentage of predicted forced expiratory volume in 1 second on days 1 and 3, and rate of pulmonary complications (except atelectasis).

We read this original article with interest; however, there are some interesting aspects that were not taken into account and could influence the

TABLE 1. Aspects related to atelectasis rate in postoperative surgery

Muscle paralysis
Intravenous or inhalational anesthetics
Body mass index*
Induction of anesthesia (use of a gas mixture)
Intraoperative fraction of inspired oxygen†
Surgery times
Sedation

*Although obese patients were not included in this analysis, there is no independent analysis of this factor between the groups. †This is an important element because it is associated with a greater reduction in the proportion of nitrogen and development of atelectasis. This aspect could explain the worse response in the group with standard oxygen versus noninvasive ventilation with respect to a different fraction of inspired oxygen; the intraoperative aspect was not evaluated in the study.⁵

interpretation of the outcome. (1) Small numbers of patients were enrolled in both arms of the study, and current smokers should have been grouped separately. Al Jaaly and colleagues² did not describe the preoperative baseline situation, and that is a crucial aspect.³ For assessment of postoperative acute respiratory failure, it would be relevant to know the baseline oxygenation index and fraction of inspired oxygen before and after extubation. (2) We do not have information regarding the use of any intraoperative recruitment maneuvers that have shown to have implications for the perioperative period.⁴ (3) Atelectasis rates were clearly different between groups. Atelectasis should be assessed by the radiologist, not the senior clinical team. The atelectasis was diagnosed on clinical basis, and bias may have been a factor. Chest radiography is not sensitive for detection of postoperative atelectasis. There are some factors in the preoperative and postoperative periods that need clarification because they may have influence the results observed⁵; we have summarized them in Table 1. Finally, limited training of the cardiac intensive care unit staff may have influenced the benefit of NIV. NIV was applied intermittently, rather than continuously for few hours.

We consider that further prospective randomized studies will encourage evaluating specific NIV strategies and how intra-operative factors are implicated in postoperative pulmonary complications, especially atelectasis.

Antonio M. Esquinas, MD, PhD,
FCCP, International Fellow AARC^a
Harry Gill, RRT-NPS, RPFT, RN^b
Bushra Mina, MD, FCCP, FACP^c

^aIntensive Care Unit
Hospital Morales Meseguer
Murcia, Spain

^bRespiratory Therapy
Lenox Hill Hospital
New York, NY

^cPulmonary Critical Care Fellowship
Program, Medical Intensive Care
Unit, Critical Care Medicine
Lenox Hill Hospital
New York, NY

References

- De Santo LS, Bancone C, Santarpino G, Romano G, Della Corte A, Vicchio M, et al. Noninvasive positive-pressure ventilation for extubation failure after cardiac surgery: pilot safety evaluation. *J Thorac Cardiovasc Surg.* 2009;137:342-6.
- Al Jaaly E, Fiorentino F, Reeves BC, Ind PW, Angelini GD, Kemp S, et al. Effect of adding postoperative noninvasive ventilation to usual care to prevent pulmonary complications in patients undergoing coronary artery bypass grafting: a randomized controlled trial. *J Thorac Cardiovasc Surg.* 2013;146:912-8.
- Polese G, Lubli P, Mazzucco A, Luzzani A, Rossi A. Effects of open heart surgery on respiratory mechanics. *Intensive Care Med.* 1999;25:1092-9.
- Celebi S, Köner O, Menda F, Korkut K, Suzer K, Cakar N. The pulmonary and hemodynamic effects of two different recruitment maneuvers after cardiac surgery. *Anesth Analg.* 2007;104:384-90.
- Hedenstierna G, Rothen HU. Atelectasis formation during anesthesia: causes and measures to prevent it. *J Clin Monit Comput.* 2000;16:329-35.

<http://dx.doi.org/10.1016/j.jtcvs.2013.06.053>

Reply to the Editor:

We thank Esquinas and colleagues for their interest in our article and for their comments. They make 3 points. (1) Our trial was small and did not include any subgroup analyses, in

The Editor welcomes submissions for possible publication in the Letters to the Editor section that consist of commentary on an article published in the Journal or other relevant issues. Authors should: • Include no more than 500 words of text, three authors, and five references. • Type with double-spacing. • See <http://jtcvs.ctsnetjournals.org/misc/fora.shtml> for detailed submission instructions. • Submit the letter electronically via jtcvs.editorialmanager.com. Letters commenting on an article published in the JTCVS will be considered if they are received within 6 weeks of the time the article was published. Authors of the article being commented on will be given an opportunity of offer a timely response (2 weeks) to the letter. Authors of letters will be notified that the letter has been received. Unpublished letters cannot be returned.