Commentary: The severity of COPD affects outcomes of TAAA repair – Is GOLD the answer?

Ana Lopez-Marco, PhD, Aung Y. Oo, MD

PII: S0022-5223(23)00996-0
DOI: https://doi.org/10.1016/j.jtcvs.2023.10.039
Reference: YMTC 19343

To appear in: The Journal of Thoracic and Cardiovascular Surgery

Received Date: 19 October 2023
Accepted Date: 19 October 2023

Please cite this article as: Lopez-Marco A, Oo AY, Commentary: The severity of COPD affects outcomes of TAAA repair – Is GOLD the answer?, The Journal of Thoracic and Cardiovascular Surgery (2023), doi: https://doi.org/10.1016/j.jtcvs.2023.10.039.

This is a PDF file of an article that has undergone enhancements after acceptance, such as the addition of a cover page and metadata, and formatting for readability, but it is not yet the definitive version of record. This version will undergo additional copyediting, typesetting and review before it is published in its final form, but we are providing this version to give early visibility of the article. Please note that, during the production process, errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Copyright © 2023 Published by Elsevier Inc. on behalf of The American Association for Thoracic Surgery
Commentary: The severity of COPD affects outcomes of TAAA repair – Is GOLD the answer?

Ana Lopez-Marco, PhD and Aung Y. Oo, MD
Division of Aortovascular Surgery, Department of Cardiothoracic Surgery and
St Bartholomew’s Hospital, London

Word Count: 500

Disclosures:
Aung Y. Oo act as a consultant and proctor for Terumo Aortic, also receives educational and research grants from Terumo Aortic and Artivion. Ana Lopez-Marco receives educational grants from Terumo Aortic and Artivion and participates in post-market registries for Artivion.

Correspondence:
Aung Y. Oo, MD, Division of Aortovascular Surgery, Department of Cardiothoracic Surgery and
St Bartholomew’s Hospital, London EC1A 7BE (E-mail: a.y.oo@qmul.ac.uk)
Central Message: Risk stratification of patients with COPD undergoing thoracoabdominal aneurysm repair can be achieved by GOLD staging based on the severity of air flow limitation. It will provide opportunity for preoperative optimisation as well as treatment strategy.

Central Picture Legend: Ana Lopez-Marcos, PhD and Aung Y. Oo, MD

Insert main text here.

Since the report by DeBakey et al in 1953, open repair has been the gold standard in management of thoracoabdominal aortic aneurysms (TAAA). Although, outcomes of TAAA surgery have improved over the last 7 decades, the physiological insult of the procedure lead to temporary but profound multiorgan dysfunction in patients undergoing surgery. The effect of respiratory and renal failure on the outcomes of TAAA surgery is well recognised.

Svensson et al reported that prolonged ventilation with tracheostomy carries high mortality (40%) in TAAA surgery and identified PEF as independent predictor for respiratory failure in patients with chronic lung disease (COPD). Etz and co-workers, however, failed to demonstrate COPD as independent predictor of lung failure. Girardi et al found that the preoperative forced expiratory volume in 1 second (FEV1) < 50% of expected, was a strong predictor of increased respiratory failure, tracheostomy and mortality in patients undergoing DTA and TAAA surgery, although it was not an independent predictor of long-term mortality. These conflicting results highlight the complexity of the interplay between preoperative risk factors and their contribution to the clinical outcomes.
To address this problem, Orozco-Sevilla and colleagues review their extensive experience of 2368 elective TAAA open repairs from 1st October 1986 to 31st August 2022. Their institution has the largest experience in TAAA repair, enabling to assess and analyse large cohort of patients with adequate statistical power.

They studied the association between mortality and adverse events in elective TAAA repair with the severity of COPD stratified by the GOLD spirometric classification. Authors categorised the preoperative respiratory dysfunction as GOLD 1 (FEV1 ≥ 80% of predicted value), GOLD 2 (50% ≤ FEV1 < 80% of predicted value), GOLD 3 (30% ≤ FEV1 < 50% of predicted value), or GOLD 4 (FEV1 < 30% of predicted value). The study cohort included patients without COPD n=633 and with COPD n=1735, of which majority in GOLD 2 (n=1215) and least in GOLD 4 (n=32). Overall, the outcomes are outstanding with operative mortality of 3.8% (without COPD) vs 7.9% (with COPD), pulmonary complications 30% (without COPD) vs 38.4% (with COPD) and spinal cord deficit 6.8% (without COPD) vs 10.3% (with COPD). Patients with severe COPD developed much higher respiratory complications (GOLD 3 45% and GOLD 4 46.9%). The follow up survival at 5 years is significantly lower in GOLD 4 (31.3%) vs GOLD 1 (68.7%).

This study elegantly demonstrated the patients with COPD are at significantly higher risk of operative death and adverse events including respiratory complications and spinal cord deficit.

Despite advancement in surgical techniques, organ protection strategies as well as intensive care management, open repair of TAAA in COPD patients carries high mortality and morbidities. The GOLD stratification in airflow limitation provides information appropriate for individual subgroup of patients with varying severity of COPD. This information allows more comprehensive discussion in multidisciplinary teams to tailor different treatment strategies (open vs.
endovascular surgery), targeting preoperative respiratory optimisation to patients at higher risk and counselling patients for the management of their aortic disease and associated co-morbidities.

References


5. Svensson, Lars G., et al. “A Prospective Study of Respiratory Failure after High-


