Sirs,

Acute respiratory distress syndrome (ARDS) is a common and devastating complication after H influenza infection.1 Despite advanced mechanical ventilation support, some patients develop refractory hypoxemia and/or hypercarbia, leading to morbidity and mortality. Prone ventilation may improve oxygenation and outcomes.2 Nevertheless, some patients remain hypoxemic despite prone ventilation or may have contraindications to it. These patients can possibly benefit from rescue therapies such as extracorporeal membrane oxygenation (ECMO). However, it is available only at few centers in Delhi. Most of these patients are unfit for inter-hospital transport on conventional treatment to an ECMO center, thus limits the access to this rescue therapy. ECMO retrieval allows safe mobilization of these patients to ECMO center and improves chances of survival. We report a case of ECMO retrieval in Delhi, India, of a patient with severe ARDS to a Tertiary Care Centre.

A 62-year-old male was admitted to Medical Intensive Care Unit (ICU) of another hospital with bilateral pneumonia and acute hypoxemic respiratory failure.

He is a known case of type two diabetes mellitus, on oral hypoglycemic agents. He was well until 10 days before the admission, when he developed dry cough and breathlessness. His symptoms worsened a day prior to ICU admission.

On admission to medical ICU, he was in severe respiratory distress. He was breathing at the rate of 35/min and required 10 l/min of oxygen to keep his SpO2 around 90%. His pulse rate was 110/min, with blood pressure of 130/70 mmHg. He was febrile up to 38.5°C. He had bilateral crepts in chest and rest of the systemic examination was unremarkable. His chest X-ray (CXR) revealed bilateral nonhomogenous infiltrates. Pneumonia screening including H influenza was sent, and he was empirically started on piperacillin + tazobactam, clarithromycin, and oseltamivir. He was also started IV methylprednisolone 80 mg/day.

His hypoxemia worsened over the next day; initially, he was put on noninvasive ventilation, but after few hours, he required intubation and mechanical ventilation. After this, he was initiated on fentanyl and midazolam infusion along with atracurium infusion. His SpO2 remained around 85% despite FiO2 of 1 and positive end-expiratory pressure (PEEP) up to 14 cm H2O. In view of refractory hypoxemia, he was put on prone position ventilation, which initially improved SpO2 to 92%, but over the next few hours, his SpO2 again dropped to 82%. His arterial blood gas done on the above ventilator settings had PaO2/FiO2 ratio 60, pH of 7.29, and PaCO2 of 50 mmHg. ECMO was offered as a possible therapeutic option, and a reference was sent to our team for possible transfer to ECMO center.

ECMO team reached the reference hospital within 2 h of generating the call. After clinical assessment, it was decided to proceed with ECMO retrieval. Bedside venovenous, ECMO was installed with 28 F access cannulae in the right femoral vein and 21 F return cannulae in the right internal jugular vein via percutaneous approach [Figure 1]. The procedure was completed satisfactorily without any complications. Once on ECMO support, his SpO2 improved to 98%. He was transported in ambulance via road on ECMO support and mechanical ventilation to our hospital.

The patient was admitted in ECMO ICU at our hospital, and his ventilator support was changed to rest lung ventilation. Laboratory investigations were unremarkable except bronchoalveolar lavage and nasopharyngeal swab for H influenza came positive. He received oseltamivir for a total of 10 days. His lung compliance started improving in the 2nd week of ECMO support with CXR clearing [Figure 2]. On day 16 at our center, his ECMO support weaned off successfully. He was discharged from our hospital on day 43.

Patients with severe ARDS having refractory hypoxemia despite high PEEP and FiO2 on mechanical ventilation are at a high risk of dying. The risk of death in these patients may range from 50% to 80% depending on the PaO2/FiO2 ratio and/or Murray score.3

Limited interventions have demonstrated mortality benefit in severe ARDS. First, lung protective ventilation using...
low tidal volumes. Second, prone ventilation, which is known to improve oxygenation for years, has recently demonstrated outcome benefits. Last but not the least, ECMO is evolving as another promising therapy. Studies have demonstrated survival benefits without disability at 6 months on comparison to conventional management. Rest lung ventilation by keeping Pplat < 25 mmHg and low FiO$_2$ along with the systemic support of ECMO reduces the possibility of ventilator-associated lung injury and possibly help in lung recovery.

Patients of severe ARDS with potential reversible respiratory failure when transported to ECMO center provide them a better chance to survive. Ideally, they should be transported to ECMO center before they become critically unstable. However, some of these patients rapidly develop severe hypoxemia, which may increase the risk of morbidity and mortality during transport. Development of ECMO retrieval teams may help in safe transport to tertiary center and salvaging these patients. Most countries have well established ECMO retrieval services, which may lead by an intensivist, anesthetist, or surgeon along with ICU nurse and perfusionist. Intensivist lead models are more rapid and cost effective.

Our ECMO services were established in late 2013. Since then, we are successfully providing ECMO services at our center and providing ECMO retrievals in Delhi National capital region (NCR) region. We did not have any complication in initiating ECMO at another center or during the transport. However, it goes without saying meticulous planning; trained staff, and teamwork remains an integral component of such endeavor.

Developing ECMO retrieval services helps safe transport of critically unwell patients with severe respiratory failure and enhances their chances of survival.

Financial support and sponsorship
Nil.

Conflicts of interest
There are no conflicts of interest.

Raj Kumar, Deepak Verma
Department of Respiratory Critical Care Medicine, Max Super Speciality Hospital, New Delhi, India
E-mail: rajshweta@live.in

REFERENCES
1. Louie JK, Acosta M, Winter K, Jean C, Gavali S, Schechter R, et al. Factors associated with death or hospitalization due to pandemic 2009 influenza A (H1N1) infection in California. JAMA 2009;302:1896-902.
2. Guérin C, Reignier J, Richard JC, Beuret P, Gacouin A, Boulin T, et al. Prone positioning in severe acute respiratory distress syndrome. N Engl J Med 2013;368:2159-68.
3. Available from: https://www.elso.org/Resources/Guidelines.aspx. [Last accessed on 2015 Oct 23].
4. Ventilation with lower tidal volumes as compared with traditional tidal volumes for acute lung injury and the acute respiratory distress syndrome. The Acute Respiratory Distress Syndrome Network. N Engl J Med 2000;342:1301-8.
5. Peek GJ, Clemens F, Elbourne D, Firmin R, Hardy P, Hibbert C, et al. CESAR: Conventional ventilatory support vs extracorporeal membrane oxygenation for severe adult respiratory failure. BMC Health Serv Res 2006;6:163.
6. Australia and New Zealand Extracorporeal Membrane Oxygenation (ANZ ECMO) Influenza Investigators, Davies A, Jones D, Bailey M, Beca J, Bellomo R, et al. Extracorporeal membrane oxygenation for 2009 influenza A (H1N1) acute respiratory distress syndrome. JAMA 2009;302:1888-95.
7. Starck CT, Hasenclever P, Falk V, Wilhelm MJ. Interhospital transfer of seriously sick ARDS patients using veno-venous extracorporeal membrane oxygenation (ECMO): Concept of an ECMO transport team. Int J Crit Illn Inj Sci 2013;3:46-50.
8. Bryner B, Cooley E, Copenhaver W, Brierley K, Teman N, Landis D, et al. Two decades’ experience with interfacility transport on extracorporeal membrane oxygenation. Ann Thorac Surg 2014;98:1363-70.
9. Warren J, Fromm RE Jr., Orr RA, Rotello LC, Horst HM; American College of Critical Care Medicine. Guidelines for the inter-
intrahospital transport of critically ill patients. Crit Care Med 2004;32:256-62.
10. Lucchini A, De Felippis C, Elli S, Gariboldi R, Vimercati S, Tundo P, et al. Mobile ECMO team for inter-hospital transportation of patients with ARDS: A retrospective case series. Heart Lung Vessel 2014;6:262-73.
11. Burrell A, Pellegrino V, Pilcher D, Bernard S, Kennedy M. Retrieval of patients with severe respiratory failure on venovenous extracorporeal membrane oxygenation: An intensivist-led model. Crit Care 2012;16 Suppl 1:P95.

This is an open access article distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 3.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as the author is credited and the new creations are licensed under the identical terms.

Rheumatoid arthritis associated interstitial lung disease: 1 year is too much to exclude methotrexate-induced pulmonary involvement

Sir,

We read the article, “Pulmonary involvement in rheumatoid arthritis: A cross-sectional study in Iran” by Zayeni et al. [1] with great interest. The authors have evaluated 44 patients of rheumatoid arthritis with pulmonary function testing (PFT), chest X-ray, high-resolution computed tomography (HRCT) of the lungs, and disease activity score 28. The authors have excluded the patients with history of smoking and use of drugs such as gold, penicillamine, sulfasalazine, and methotrexate for more than 1 year. Rheumatoid arthritis associated interstitial lung disease (RA-ILD) is more commonly found in male, history of smoking, and high titers of rheumatoid factor and with duration of the disease.

In the present study, the male are under-represented (9 patients, 20.45%) and smokers have been excluded totally. Thus, the study has significant selection bias.

Studies suggest that methotrexate-induced ILD is most frequently occurs after 4–6 months after initiation of therapy.

The authors tried to exclude methotrexate-induced ILD by exclusion of patients taking methotrexate for more than 1 year. While this did not exclude patients having methotrexate-induced ILD, it might have excluded patients having long duration of RA which is linked with development of RA-ILD.

Second, the authors mentioned HRCT findings as nodules, fibrosis, cyst, bronchiectasis, air trapping, and bronchiolectasia. However, RA-ILD is classically divided into usual interstitial pneumonia (UIP), nonspecific interstitial pneumonia, organizing pneumonia, lymphocytic interstitial pneumonia (LIP), bronchiolitis, etc. Hence, the present study lacks these specific patterns of ILD which are recognized worldwide. According to available literature, UIP is the most common form of ILD in RA.

Third, the authors have stated that “air trapping” was the most common finding in patient’s PFT, and there is no mention of PFT variables in the present study. Instead of simply summarizing these PFT findings, the authors could have mentioned the PFT variables which would be more helpful for quantification and severity grading of lung function.

Financial support and sponsorship
Nil.

Conflicts of interest
There are no conflicts of interest.

Ashok Kuwal, Naveen Dutt, Nishant Chauhan
Department Pulmonary Medicine, All India Institute of Medical Sciences, Jodhpur, Rajasthan, India
E-mail: kuwal.dr@gmail.com

REFERENCES
1. Zayeni H, Haji-Abbasi A, Foumani SA, Tohidi M, Masooleh I, Parsa B, et al. Pulmonary involvement in rheumatoid arthritis: A cross-sectional...