The schematic plot illustrating the potential different role of MV during VV

The literature supports the use of adjunct therapies to promote adequate gas exchange in MV patients as noted by Ali, Hassan, and George (2016), and Shekar et al. (2013). Adjunct therapies are utilized to promote adequate ventilation/oxygenation such as: neuromuscular blockade agents (NMBAs), prone positioning, and/or high frequency oscillating ventilation/oxygenation such as: neuromuscular blockade agents (NMBAs), prone positioning, and/or high frequency oscillating ventilation (HFOV) including combinations of above therapies as noted by Marhong et al. (2015), Culbreth and Goodfellow (2016), Chiumello & Brioni (2016), Del Sorbo et al. (2015), Turner and Cheifetz (2013), and Shekar et al. (2013). LPV is not always enough to provide adequate gas exchange in MV patients as noted by Ali, Hassan, and George (2016), and Shekar et al. (2013).

The trend of not only using ECMO but early implementation of ECMO, and combine with adjunct therapies to treat adults with ARDS could improve survival rates, reduce the incidence of VILI and improve quality of life after survival of ARDS.

Acute respiratory distress syndrome (ARDS) carries a high mortality rate of 34-55% as noted by Peek et al. (2009), Chiumello and Brioni (2016), Shekar, Davies, Mullany, Tiruvoipati, & Fraser (2013), and Paolone (2017). Ventilator induced lung injury (VILI) caused by high mechanical ventilator (MV) settings has detrimental effects on patient outcomes as noted by Marhong, Manuhi, Detsky, Teljesnicki, & Fan (2015), Tremblay and Slunsky (2006), Turner and Cheifetz (2013) and Kuchnicka and Maciejewski (2013). The goal in the management of ARDS is to provide lung rest and allow for ultra protective ventilation (LPV) as noted by Chiumello & Brioni (2016), Del Sorbo, Goffi, Goligher, Fan, and Slunsky (2015), Turner and Cheifetz (2013), and Shekar et al. (2013). LPV is not always enough to provide adequate gas exchange in MV patients as noted by Ali, Hassan, and George (2016), and Shekar et al. (2013).

All authors of this literature review agree that more high quality research needs to be done to provide better guidelines to optimal intervention, focus other than that related to key terms, and/or populations other than adults, narrow or too specific ELSO and improve quality of life after survival of ARDS.

Studies suggest that ECMO may improve the mortality rates in adults with ARDS to 30-37% and reduce VILI (Peek et al., 2009 and Shekar et al., 2013). Chiumello and Brioni, (2016) and Del Sorbo et al., (2015) advise using LPV to prevent/reduce VILI. Evidence from seven of the 12 studies agree that LPV should be the goal of ARDS treatment as noted by Culbreth and Goodfellow (2016), Tremblay and Slunsky (2006), Chiumello and Brioni (2016), Del Sorbo et al. (2015), Turner and Cheifetz (2013), Shekar et al. (2013), and Paolone (2017). The literature supports the use of adjunct therapies to promote the use of LPV. Researchers agree that LPV is not always adequate support for the patient as noted by Marhong et al. (2015), Ali et al. (2016), Chiumello and Brioni (2016), Del Sorbo et al. (2015), Shekar et al. (2013), He et al. (2017), and Kuchnicka and Maciejewski (2013). Marhong et al. (2015), Peek et al. (2009), Ali et al. (2016), Chiumello and Brioni (2016), Del Sorbo et al. (2015), Turner and Cheifetz (2013), Shekar et al. (2013), He et al. (2017), and Paolone (2017) illustrate the utilization of ECMO to allow for LPV and therefore reducing VILI and improving outcomes.

The trend of not only using ECMO but early implementation of ECMO in combination with adjunct therapies to treat adults with ARDS could improve survival rates, reduce the incidence of VILI and improve quality of life after survival of ARDS.

The level of evidence was rated using the evidence pyramid methodology described by Whittemore & Knaff (2005) and Brown (2018). The Cochran Library, PubMed, CINAHL Plus, Medline Complete and Google Scholar were searched using the key terms “ECMO” and “ventilator induced lung injury”. Bibliographic Mining also produced results.

Inclusion criteria consisted of articles discussing the treatment modalities for adults with ARDS, methods to reduce VILI, and the utilization of ECMO. The original search identified 60 articles and 2 articles obtained via Bibliographic mining. Twenty-one articles were duplicates. After reviewing the articles, 29 articles were excluded for patient populations other than adults, narrow or too specific ECMO intervention, focus other than that related to key terms, and/or inability to find full text, for a final sample size (n=41). Articles were reviewed and information was analyzed and compared to compile a synthesis report of the information.

The level of evidence was rated using the evidence pyramid published by Long & Gannaway (2015), 3 minute checklist by Godin (2011), as well as Appraisal Guides by Brown (2018).