EFEKTIVITAS *EXTRACORPOREAL MEMBRANE OXYGENATION* (ECMO) SEBAGAI TERAPI OKSIGENASI PADA PASIEN COVID-19 DENGAN ARDS : TINJAUAN PUSTAKA SISTEMATIS DAN META ANALISIS

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Abstrak

Latar Belakang : *Coronavirus Disease-2019* (COVID-19) merupakan penyakit yang menyerang organ pernapasan akibat infeksi dari SARS-Cov-2. Invasi virus tersebut mampu merusak sel-sel dalam organ paru dan jantung yang akhirnya menimbulkan beberapa sindrom atau gejala kritis yang dikenal dengan *Acute Respiratory Distress Syndrome* (ARDS). Tingginya angka kejadian mortalitas pada pasien COVID-19 dengan ARDS menyebabkan perlu pengembangan tata laksana yang efektif. Saat ini, efektivitas *Extracorporeal Membrane Oxygenation* (ECMO) sebagai terapi pendukung dalam oksigenasi pada pasien COVID-19 disertai ARDS yang belum diketahui pasti. Beberapa penelitian telah dilakukan mengenai keamanan ECMO, akan tetapi dalam efikasi belum diketahui sehingga diperlukan penggambaran yang jelas terkait keamanan dan efikasi untuk membuktikan apakah ECMO efektif terhadap COVID-19 dengan ARDS. **Metode :** Peneliti melakukan *Sytematic Review* dan meta analisis terhadap 12 jurnal dengan pencarian literatur menggunakan *Cochrane Library, ProQuest, PubMed, Science Direct, SAGEPub,* dan *Google scholar*. Strategi PICO (P : COVID-19 dengan ARDS, I: ECMO dengan VV (Venovenous) , VA (Venoarterial), VAV (Venoarterial-Venous), C : Tidak ada, O : Mortalitas, *Survival Rate*, dan *Length of Stay*) dengan seleksi PRISMA-P serta dilakukan penilaian jurnal dengan JBI *Critical Appraisal Checklist*. Analisis data menggunakan aplikasi Review Manager 5.4 dan Comprehensive Meta Analysis V3 melalui meta analisis. Efek gabungan akan bernilai signifikan jika nilai $p<0.05$. **Hasil** : 12 jurnal terpilih dengan kategori baik dan sedang dengan jumlah sampel 6.255 pasien menunjukkan hasil studi berupa ECMO memiliki angka kejadian mortalitas sebesar 38.3%, angka ketahanan hidup sebesar 48%, dan mengurangi rawat inap *survivor* dibandingkan *non-survivor* sebesar 8.17 (95% CI, -4.33;16.52) di ICU dan 19.30 (95% CI, 7.33;31.27) di rumah sakit. **Kesimpulan** : Terapi ECMO terbukti cukup efektif karena terdapat hubungan yang signifikan antara ECMO terhadap mortalitas, survival rate, dan lama rawat inap ICU dan rumah sakit pada pasien COVID-19 dengan ARDS.

Kata kunci: ECMO, Terapi *Covid-19,* ARDS, efektivitas

EFFECTIVITY OF EXTRACORPOREAL MEMBRANE OXYGENATION (ECMO) AS OXYGENATION THERAPY IN COVID-19 PATIENTS WITH ARDS: SYSTEMATIC REVIEW AND META ANALYSIS

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Abstract

Background: *Coronavirus Disease-2019 (COVID-19) is a disease that attacks the respiratory organs due to infection from SARS-Cov-2. The viral invasion is able to damage cells in the lungs and heart which eventually causes several critical syndromes or symptoms known as Acute Respiratory Distress Syndrome (ARDS). The high incidence of mortality in COVID-19 patients with ARDS requires the development of effective management. At present, the effectiveness of Extracorporeal Membrane Oxygenation (ECMO) as the therapy of choice in COVID-19 patients with ARDS is uncertain.* *Several studies have been conducted regarding the safety of ECMO, but the efficacy is not yet known so that a clear description of safety and efficacy is needed to prove whether ECMO is effective against COVID-19 with ARDS.* ***Methods:*** *Researchers conducted a systematic review and meta-analysis of 12 journals by searching the literature using the Cochrane Library, ProQuest, PubMed, Science Direct, SAGEPub, and Google scholar. PICO strategy (P: COVID-19 with ARDS, I: ECMO with VV (Venovenous), VA (Venoarterial), VAV (Venoarterial-Venous), C: None, O: Mortality, Survival Rate, and Length of Stay) with PRISMA-P selection and journal assessment using the JBI Critical Appraisal Checklist. Data analysis using the application Review Manager 5.4 and Comprehensive Meta Analysis V3 through meta analysis. The combined effect will be significant if the p value < 0.05.* ***Results:*** *12 selected journals with good and moderate categories with a sample size of 6,255 patients showed that the results of the study in the form of ECMO had a mortality rate of 38.3%, a survival rate of 48%, and reduced hospitalization for survivors compared to non-survivors by 8.17 (95% CI), -4.33;16.52) in the ICU and 19.30 (95% CI, 7.33;31.27) in the hospital.* ***Conclusion:*** *ECMO therapy has proven to be quite effective because there is a significant relationship between ECMO on mortality, survival rate, and length of ICU and hospital stay in COVID-19 patients with ARDS.*

Keywords: *ECMO, Covid-19 Therapy, ARDS, effectivity*