# Thromboembolic complication among COVID-19 patients in the intensive care unit: A single-centre study from a Malaysian perspective

**Hanis Hanum Zulkifly[1], Nur Farhani Mansor[1], Izzati Abdul Halim Zaki[1], Lee Chew Kiok[2], Kar Seng Eng[2], Tharmini Ravi[2], Mohan Pathmanathan[3], Mohd Shahezwan Abd Wahab[1], Mohd Rahimi Muda[1]**

[1]Fakulti Farmasi, Universiti Teknologi MARA Kampus Puncak Alam, Selangor, [2]Hospital Sungai Buloh, Selangor Darul Ehsan, [3]Institute of Clinical Research, National Institute of Health

## ABSTRACT

**Introduction:** The emerging complications of thromboembolism (TE) in COVID-19 patients have led to severe consequences such as death. Nonetheless, the prevalence of TE complications among COVID-19 patients in the Intensive Care Unit (ICU) in Malaysia is unknown. The aim of this study is to investigate the prevalence of thromboembolic (TE) complications including venous deep vein thrombosis (DVT), pulmonary embolism (PE), and line related thrombosis] and arterial [stroke, peripheral arterial disease and myocardial infarction (MI)] thrombosis and mortality among COVID-19 patients admitted to an ICU in Hospital Sungai Buloh. **Materials and Methods:** In this retrospective Malaysian cohort study, patients admitted to a single centre ICU with polymerase chain reaction (PCR) confirmed of SARS-CoV-2 virus and received adequate thromboprophylaxis within February 2020-2021 were included. Thromboembolic (TE) event is a combination of venous and arterial thrombosis. **Results:** Mean (SD) age 56.6 (13.7), 63.5% were male, 61.6% Malays, median (IQR) 7 (3-14) days of ICU admission, 64.2%, 53.2 % and 20.9% had underlying hypertension, diabetes and obesity respectively. Of 534 patients, 4 (0.7%) developed DVT, 198 (37.1%) PE and 2 (0.4%) line related thrombosis. Meanwhile, 21 (3.9%) developed stroke, 39 (7.3%) MI, 1(0.2%) PAD and 22.8% died despite adequate thromboprophylaxis. In total, 240 (44.9%) developed TE event during their ICU admission. Significantly higher proportions of COVID-19 patients who developed complications of DVT (2.5% vs. 0.2%; $p=0.013$), PE (47.5% vs 34.0%; $p=0.006$), stroke (12.3% vs. 1.5; $p<0.001$) and MI (16.4% vs. 4.6%; $p<0.001$) died. Age, duration of ICU admission, obesity, white cell count (WCC), troponin, D-Dimer and corticosteroid use were significantly greater among those with TE events. Demographics, comorbidities, other laboratory parameters and inflammatory markers were similar in COVID-19 patients with and without TE events. Predictors of TE events on multivariate logistic regression analysis were age [OR 1.02 (95% CI 1.00-1.03)], obesity [OR 2.84 (95% CI 1.93-4.18)], WCC [OR 1.04 (95% CI 1.00-1.07)], and duration of ICU admission [OR 1.04 (95% CI 1.02-1.06)]. **Conclusion:** In this cohort of severely ill COVID-19 patients, the overall prevalence of TE complication was high (44.9%) with the overall mortality of 22.8% despite adequate thromboprophylaxis. Key predictors of TE events included age, obesity, white cell count, and duration of ICU admission. Perhaps a more aggressive treatment (combination of thromboprophylaxis and enhanced anti-inflammatory treatment) may be needed among COVID-19 patients admitted to ICU with high risk factors to prevent further increase in the incidence of thromboembolism and death.

**Keywords:** COVID-19, Thromboembolism, ICU

# Long-term renal outcome of living kidney donors: A single centre experience

**Song Chan Hoong[1], Wong Hin Seng[2], Suryati Yakob[1]**

[1]Department of Nephrology, Hospital Selayang, [2]Clinical Research Centre, Hospital Selayang

## ABSTRACT

**Introduction:** Living kidney donor (LKD) remains an important kidney source for transplantation. This study aims to assess the long-term renal outcome of LKD in a local setting. **Materials and Methods:** This is a retrospective descriptive cohort study of the renal outcome of LKD who donated their kidney in Selayang Hospital from year 2000 until 2016. The renal function measured using CKD-EPI equation at 5 and 10 years were analysed. **Results:** A total of 61 LKD operations took place in Selayang Hospital from year 2000 to 2016 with predominant female donors (72.13%). The proportion of Malay, Chinese and Indian donors are 59.02%, 29.5% and 11.48% respectively. The mean age at kidney donation was 43.44±9.05 years old. The mean eGFR (ml/min/1.73m2) at kidney donation was 102.52±15.56. A total of 37 donors (60.66%) with sufficient data for analysis were identified. The mean eGFR were 75.94±15.61, 76.82±18.08 and 72.48±13.77 at 1, 5, and 10 years respectively. A repeated-measures ANOVA determined mean eGFR differed significantly across time points of pre-operation to 1, 5 and 10 years (F(3, 72)=25.932, $p<0.001$). However, mean eGFR remained stable over time (74.0±15.2 vs 76.9±19.3 vs 72.6±14.1, $p=0.383$). Therefore, the results indicated a non-significant time effect for eGFR post donor-nephrectomy. At 5- and 10-years post-donation, 14.71% (n=5/34) and 20.69% (n=6/29) donors had eGFR <60 respectively with 1 donor progressed to end stage renal disease needing haemodialysis. Hypertensive disease was documented in 32.43% (n=12) of the donors with the mean onset at 7.92±3.40 years post-donation and 5.41% (n=2) developed significant proteinuria. **Conclusion:** LKDs have favourable renal outcome post-donation.

**Keywords:** renal, kidney, living donor, nephrology