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CARDIAC SOCIETY  
BRUNEI DARUSSALAM

## Cardiac Society Brunei Darussalam

### 10th Annual Scientific Meeting

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# Brunei International Medical Journal (BIMJ)

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### FIRST PLACE

#### **P1: UNMASKING BRUGADA SYNDROME USING ORAL FLECAINIDE CHALLENGE TEST.**

Izyan Nadhirah Mohammad, Keirain Lan Binti Surip, Lau Bee Ngo.

Department of Cardiology, Raja Isteri Pengiran Anak Saleha (RIPAS) Hospital, Brunei Darussalam.

**Background:** Brugada syndrome is a rare arrhythmogenic condition that carries increased risk of sudden cardiac death from ventricular fibrillation. Sodium channel blocker challenge using flecainide or ajmaline can be used to unmask ECGs that are diagnostic for Brugada syndrome. In Brunei, oral flecainide is used to test for Brugada in selected patients.

**Methods:** This was a retrospective study looking at patients who were screened for Brugada using oral flecainide challenge test in cardiology department, RIPAS Hospital between 1<sup>st</sup> January 2020 to 31<sup>st</sup> December 2022. The patient's demographic data, family history and investigation results were compiled from patient records and analysed on Ms Excel and Evyd Research platform. Pearson chi-square test was used to test for statistical significance in categorical data with  $p < 0.05$  set as statistically significant value.

**Results:** A total of 61 patients were screened during study time period. The patients

screened had a median age of 42 years. Majority of patients were male (73.8%) and of Malay ethnicity (86.9%). 48 patients (78.7%) of the patients screened were symptomatic. 27 patients (44.3%) of the patients had family history of either Brugada syndrome or sudden death. Baseline ECG was significantly associated with result of the oral flecainide challenge test ( $p = 0.0092$ ). 49.2% (30) patients were found to be positive for Brugada syndrome. 25 patients had genetic screening done but only 1 patient had a genetic study test found variant of SCN5 gene; 3 patients were found positive for other gene and 18 patients had negative test. From the 15 patients who were sent for VT stimulation test, only 2 patients had a positive test. The remainder of patients either declined or are waiting for test to be performed. None of the patients found positive for Brugada syndrome had ICD implanted.

**Conclusion:** Although Brugada syndrome is a rare condition, almost half of patients screened using oral flecainide challenge test were found to be positive. Baseline ECG was significantly associated with a subsequent positive test. Further studies should be performed to look into exact prevalence and characteristics of patients with Brugada syndrome in Brunei.

### SECOND PLACE

#### **P2: INCIDENTAL EXTRA-CARDIAC FINDINGS ON CORONARY CT ANGIOGRAMS.**

Aimi Salam.

Radiology Department, Raja Isteri Pengiran Anak Saleha Hospital, Brunei Darussalam.

**Introduction:** Cardiovascular disease remains to be one of the highest causes of death in Brunei. However, development in imaging has made diagnosis of coronary artery disease more accessible, making coronary computed tomography angiography (CCTA) to be the leading non-invasive imaging modality for evaluation of cardiac disease. In addition, CCTA scans can also provide more information on other possible causes for their symptoms as these scans often involve other structures such as the mediastinum, lungs, upper abdominal organs and the spine. This study was performed to review the prevalence of extra-cardiac findings and the different "incidental" abnormalities that can be detected.

**Methods:** A retrospective study was performed reviewing CCTA scans done in RIPAS Radiology Department by the Cardiology team in a three month period from June 2023 to August 2023. For each case, the radiologist reports were reviewed to identify those with extra-cardiac findings. These findings were then divided into two: Group A- findings necessitating further evaluation or follow up and Group B- findings that do not typically need immediate follow up or any action.

**Results:** There were 151 patients who had CCTA in between June 2023 to August 2023. Of the 151 patients, 41 patients were reported to have one or more extra-cardiac findings giving a total of 57 "incidental" findings. Group A abnormalities were found in 25 patients (61%) whereas Group B abnormalities were identified in 16 of these patients (39%). The most common abnormalities detected in Group A were pulmonary nodules which were found in 9 out of the 41 patients. This was followed by pleural effusion (4/41) and suspicious liver lesions (3/41). Three cases were identified in this cohort requiring immediate evaluation and management, which were

pneumothorax, pericardial effusion and venous thrombosis. Majority of the group B findings included simple liver cysts and atelectasis/fibrotic bands in the lungs.

**Conclusion:** Although not many, extra-cardiac abnormalities can be detected from CCTA scans and this can range from clinically significant findings requiring immediate attention, to findings that do not need any action at all. Both cardiologists and radiologists play an important role in interpreting these scans so the abnormalities are not missed and patients can receive appropriate management.

### **THIRD PLACE**

#### **P3: A CLINICAL AUDIT OF ASSESSING COMPLIANCE OF CLINICAL PRACTICE IN A BRUNEI CARDIAC CARE UNIT WITH EVIDENCE-BASED TREATMENT GUIDELINES IN PATIENTS WITH HEART FAILURE WITH REDUCED EJECTION FRACTION (HFREF).**

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Raja Isteri Pengiran Anak Saleha (RIPAS) Hospital, Brunei Darussalam

**Introduction:** Heart failure (HF) cases are rising year by year and this can be due to aging populations, increasing prevalence of risk factors and improvement in post-myocardial infarction survival. With improvement in HF management particularly through guidelines-based medications, improvement in quality of life and survival rates have increased including reducing the burden on health care systems and the cost of re-hospitalisations.

This audit is aimed in assessing whether current practice in Coronary Care Unit (CCU) at the Brunei's Raja Isteri Pengiran Anak Saleha (RIPAS) hospital is using all

5 of Class 1 agents as per ESC 2021 HF guidelines for treatment of heart failure with reduced ejection fraction (HFrEF), whether the regimens have been optimized based on target dosages as well as factors contributing to not using all the drugs.

**Methods:** Data was prospectively collected for 6 weeks from 13 November 2021 to 25 December 2021 in CCU patients who presented with acute decompensated HF.

Quantitative data collected included age, gender, dates of period of admission to discharge, cardiac medical history including previous history of heart failure, ejection fraction (pre- if available and peri-admission) as well as presence of 5 major HF medications on the day of admission and discharge (with doses). Inclusion criteria are patient of all ages and genders with reduced left ventricular ejection fraction of 40% or less, known normal EF on admission but then deteriorated to 40% or further during hospitalisation, and known HFrEF demonstrated with departmental echocardiogram within last one year. Following this, further analysis was performed if each of the class I drugs were being prescribed appropriately or whether there were any barriers to prescribing them.

**Results:** A total of 56 patients were admitted in CCU for decompensated HF within the 6 weeks. 29 out of 56 (51.8%) patients were identified as meeting the inclusion criteria. Comparing to admission where no patients were on all 5 class 1 agents, 12 out of 29 (41.3%) of these patients were discharged with 5 of the Class 1 agents while remainder (58.6%) did not have the full combination. In addition, on further sub-analysis, results demonstrated that only a small number of patients met the targeted doses.

**Conclusion:** Despite no previous comparable audits, the result of prescribing Class 1 agents on admission versus day of discharge directly demonstrated that the practice is changing and is becoming more consistent with recent guidelines. In addition, this study highlights that there are limitations in using

the agents, usually due to underlying comorbidities or side-effects and to make sure consistency of practice is continued, longer period of re-auditing including data on follow-ups is needed.

#### **P4: SUCCESSFUL IMPLEMENTATION OF POC-INR AT THE HEART CENTRE, CARDIOLOGY RIPAS HOSPITAL BRUNEI DARUSSALAM (COLLABORATION WITH POCT SECTION).**

Hj Mohammad Ezam Emran, Meriati Binti Merikan, Heart Centre, Cardiology  
Baiyannie Nora, National Haematology Reference Laboratory  
Susylawati Hj Magon, Dk Hj Ruwaida PDP Hj Jaberudin, Emma Munirah Hj Mohamad, Hanisah Zainidin, Point-of-Care Testing, RIPAS Hospital, Brunei Darussalam

**Introduction:** Traditionally, the Warfarin Clinic, Heart Centre would require patients to come to the hospital twice for venepuncture and medication collection. Blood test is normally carried out in the morning and warfarin prescription are collected in the afternoon at the pharmacy counter. A small-scale survey showed that 37% did not agree with this practice due to the inconvenience caused, and 27% agreed it reduced their overall compliance. POC INR was eventually introduced, aimed at improving patient care and satisfaction, faster clinical decisions with better overall cost-effectiveness as compared to usual testing practice through laboratory methods. In June 2021, the cardiology department at RIPAS Hospital successfully set up a "one-stop Warfarin Clinic service" whereby patients would come in and have their POC-INR checked, have the opportunity to see doctors, and collect their prescription all in one sitting.

**Material and Method:** A patient satisfaction survey was developed and distributed to patients in collaboration with the POCT Section RIPAS Hospital to look at improvement in



health care quality. Comparative cost-effectiveness analysis was performed to compare the cost and effects.

**Results:** The survey showed improvement in patient satisfaction. 50% of patients strongly agreed and 41.2% agreed for POC-INR to be continued, 71.9% expressed satisfaction, and 50% of the patients strongly agreed it is convenient and cost-effective. The cost analysis study demonstrates a 74.3% reduction in testing cost from \$146,060 in 2020 to \$37,600 in 2023 for the traditional testing at the National Haematology Reference Laboratory. Whilst the total cost of test using POC-INR showed a steady increase from \$25,440 to \$47,040, the overall cost of POC INR testing is still lower than the traditional testing with a 34.9% reduction in cost since its introduction.

**Conclusion:** POC-INR has been successfully and fully implemented at the Heart Centre, it has proven to be cost efficient and improved overall workflow efficiently over usual care, thus increasing patient satisfaction, and providing immediate decision-making care for the patient.

#### **P5: CLINICAL AND DEMOGRAPHIC PROFILE OF CRYPTOGENIC STROKE INVESTIGATIONS IN THE BRUNEI NEUROSCIENCE STROKE & REHABILITATION CENTRE.**

Ye Thwin, Ethan Ng Heong Fei, Kyaw Zay, Dayangku Siti Nurashikin Pengiran Tengah. Brunei Neuroscience Stroke & Rehabilitation Centre.

**Introduction:** The TOAST criteria classify ischaemic stroke (IS) into five primary aetiological categories namely large-artery atherosclerosis, cardioembolism, small-vessel occlusion, stroke of other determined aetiology and cryptogenic stroke (CS). CS has been associated with mechanisms such as patent foramen ovale, occult atrial fibrillation, and

hypercoagulable states. The Brunei Neuroscience Stroke & Rehabilitation Centre (BNSRC), is the main stroke centre in Brunei Darussalam and sees the majority of stroke patients.

**Objectives:** This study aimed to determine the prevalence of CS among IS patients in BNSRC, describe their demographic characteristics and utilisation of routine and extended diagnostic modalities.

**Methods:** Data of IS patients admitted to BNSRC between 1st January 2020 and 31st May 2021 were collected from the BNSRC stroke registry and the electronic health record (BRUHIMS). Exclusions included patients under 12 years old, those with transient ischaemic attacks or haemorrhagic strokes, and individuals with identifiable stroke causes. Demographic details, clinical variables, comorbidities, and diagnostic modalities for stroke evaluation were collected.

**Results:** 38 CS cases (7.2%) were identified from 526 cases of IS, with a mean age of 57.6 years, predominantly male (68.4%). Hypertension (92.1%), diabetes (42.1%), and smoking (18.4%) were common risk factors. All patients had baseline tests, such as MRI brain, ECG, carotid Doppler, transthoracic echocardiography, and Holter monitoring. Less than half of CS patients (15/38; 39.5%) underwent trans-oesophageal echocardiography (TOE) whilst none underwent extended rhythm monitoring.

**Conclusion:** This study provides approximate population data for Brunei Darussalam. The prevalence of CS among IS patients (7.2%) in Brunei Darussalam was lower than worldwide data (15-40%) indicating thorough evaluation of stroke aetiology. However extended evaluations were potentially underutilised suggesting possible missed opportunities for diagnosis and preventative treatment. The high incidence of co-existing vascular risk factors suggests underlying vascular aetiology. Clinical pathways for ongoing investigations of these patients should be developed which could include TOE and extended cardiac

monitoring. Previous studies have reported higher AF detection rates with prolonged 21-30 days mobile cardiac outpatient telemetry (MCOT). Selected patients could also be considered for malignancy screening and genetic testing. We plan to perform outcome studies on this cohort to identify any emerging causative factors in our population which may change future management.

#### **P6: BRAIN-HEART INTERACTION IN ACUTE ISCHAEMIC STROKE IN A NEURO-CRITICAL CARE UNIT.**

Thu Ya Soe, Dayangku Siti Nur Ashikin Pengiran Tengah.  
Brunei Neuroscience Stroke and Rehabilitation Centre.

**Introduction:** Patients with acute ischemic stroke (AIS) have higher cardiovascular morbidity and mortality. In-hospital mortality for AIS in a critical care setting has been reported to be up to 30-60% and has a three-fold increased risk with acute myocardial infarction after stroke. Early cardiac evaluation may enable improved management and reduced mortality. Our service evaluation study aimed to evaluate the feasibility and efficacy of monitoring cardiac dysfunction in AIS in our neuro-critical care unit.

**Methods:** All AIS patients admitted to the Neuro-ICU from 1<sup>st</sup> January to 31<sup>st</sup> June 2023 were identified from our inpatient log. Data collected from the hospital electronic health record system included demographics and cardiac investigations (troponin-I, echocardiography, electrocardiogram, ECG) within 48 hours of AIS onset.

**Results:** 43 out of 170 patients admitted had AIS, 32 male and 11 female with mean age 59 (range 32-88 years). All patients underwent above mentioned cardiac investigations. There was evidence of cardiac dysfunction seen in 15 (35%) patients – raised troponin 15 (13 with abnormal echo), echocardiog-

raphy abnormality 13 (mostly moderate to severe global hypokinesia) and ECG abnormality eight (four atrial fibrillation, four T-wave inversion ischaemic changes; seven had concurrently raised troponin and echo abnormalities). Seven (16%) patients had abnormalities seen in all three modalities. 120-day mortality was six patients (14%); five patients (12%) had both raised troponin and abnormal echocardiography. Mortality within the first 30 days, 30-90 days and 90-120 days was two, two and two deaths respectively.

**Conclusion:** Early cardiac evaluation with these markers in AIS in a neuro-critical care setting is feasible and appears to give some indication of patients with poorer prognosis. In our patients, positive markers of cardiac dysfunction are frequent (35%) and were seen in most patients with early mortality (5/6). Our study has not evaluated stroke severity and classification or other comorbidities including reason for ICU admission and use of mechanical ventilation however supports more in-depth understanding of the brain-heart interaction in this setting. The cause-effect relationship between AIS and cardiac dysfunction is unclear and requires further study including specific management pathways.

#### **P7: NATIONWIDE EXPERIENCE OF INFECTIVE ENDOCARDITIS IN ADULT.**

Soe Min Maung.  
Cardiac Centre, Department of Cardiology, Raja Isteri Pengiran Anak Saleha Hospital, Brunei Darussalam.

**Introduction:** Infective endocarditis (IE) is an infection of the endothelial surface of the heart. IE remains a life-threatening disease with high morbidity and mortality rates of up to 30% in the first year and five years' survival rate higher than those of common cancers.<sup>1,2</sup> The cardiac manifestations include

valvular vegetation, abscess, peri-annular extension and myopericarditis, etc. Echocardiography is essential in the diagnosis of IE. Multidisciplinary care team involving cardiology, cardiothoracic surgery, infectious diseases specialists, radiologists, and neurologists are often required. Moreover, IE imposes a tremendous burden on healthcare resources as a result of prolonged hospital stay for intravenous antibiotic therapy and high potential for surgical intervention.<sup>3</sup>

**Methods:** We retrospectively reviewed 19 patients with definite diagnosis of IE according to Modified Duke Criteria admitted between January 2022 to December 2022 were reviewed for clinical and microbiological outcomes.

**Results:** [12 Male (63%); 7 Female (37%), mean age of 53.79 ± 18.71 years] were involved in this study. Around 2/3 of the patients has cardiovascular risk factors, and 4 patients [21%] were on hemodialysis via permanent catheter. Among the presentations, fever was the most common complaint in initial presentation with 89% of the patient presented, followed by malaise. Blood culture results showed Staphylococcus aureus was the most common organism grown with 6 patients [31.6%], and culture negative was found in 4 patients. Mitral valve was the most common site of vegetation [9 patients, 47.36%]. Six patients underwent valve replacement surgery for valvular incompetence & its complication. IE related mortality was observed in 5 out of total 19 patients [26.3%] in the first year.

**Conclusion:** Although IE is not a common disease, it still carries high morbidity and mortality rates. Early recognition of IE and timely intervention are required to improve further for preventive as well as therapeutic measures to reduce mortality and morbidity associated with IE.

## References

1: TJ Cahill, BD Prendergast, Infective endocarditis. Lancet. 2016;10021:882–893.

- 2: Gilbert Habib, Patrizio Lancellotti, et.al. ESC Scientific Document Group, 2015 ESC Guidelines for the management of infective endocarditis: The Task Force for the Management of Infective Endocarditis of the European Society of Cardiology (ESC) Endorsed by: European Association for Cardio-Thoracic Surgery (EACTS), the European Association of Nuclear Medicine (EANM), European Heart Journal. 2015;36(44):3075–3128. <https://doi.org/10.1093/eurheartj/ehv319>.
- 3: M. Alkhouli, F. Alqahtani, et.al. Clinical and economic burden of hospitalizations for infective endocarditis in the United States. Mayo Clin Proc. 2020;95(5):858–866.

## P8: PRIMARY PERCUTANEOUS CORONARY INTERVENTION AMONG YOUNG PATIENTS WITH ST-ELEVATION MYOCARDIAL INFARCT IN BRUNEI: REVEALING THE TICKING TIME BOMB.

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<sup>1</sup>Gleneagles JPMC, <sup>2</sup> Raja Isteri Pengiran Anak Saleha Hospital, Brunei Darussalam.

**Introduction:** ST-Elevation Myocardial infarction (STEMI), an acute presentation of coronary artery disease, is increasingly recognized and treated worldwide. The introduction of interventional cardiology and primary percutaneous coronary intervention (PPCI) as definite treatment for STEMI in Brunei began 20 years ago. However, local data on the young population who underwent this intervention are lacking, even though it raises critical concerns from a public health perspective. Therefore, this study aims to describe the characteristics, risk factors, and in-hospital outcomes of patients aged ≤40 years who underwent PPCI at a single center, Gleneagles JPMC, Brunei Darussalam.

**Methods:** A single-arm cohort retrospective review of patients from January 2019 to September 2023 at the only cardiac catheterization laboratory in Brunei Darussalam. Variables: In-hospital mortality, extent of coronary

disease as determined by coronary angiography and cardiovascular risk factors.

**Results:** Over a 5-year period, a total of 574 patients underwent PPCI with 69 (12.02%) of them being  $\leq 40$  years old. From these young population, the mean age was  $34.93 \pm 4.08$  years old, and 64 (92.75%) of the patients were male. Most patients were admitted with anterior MI, with single-vessel involvement Left Anterior Descending (LAD) artery being the predominant culprit lesion (n:36; 52.17%). Moreover, the intrahospital mortality rate was 1.4% (n=1). Among the patients, there was a higher prevalence of risk factors, including smoking (n:51; 73.91%), hypertension (n:19; 27.54%), diabetes (n:10; 14.49%), and hyperlipidaemia (n:6; 8.69%). Another interesting risk factor was the use of anabolic steroids, which was reported in 3 patients (4.35%) for bodybuilding purposes.

**Discussion:** The relationship between modern life risk factors contributing to the alarming increase in myocardial infarction cases among young Bruneians resembles a potential time bomb, demanding urgent measures to mitigate these escalating risk factors. Young adults with myocardial infarction face an increased risk of premature morbidity and mortality, which carries profound implications for their families and society as a whole. The impact of cardiovascular events on the quality of life of young adults will affect their ability to work, participate in society, and enjoy a healthy life.

**Conclusion:** Among individuals under the age of 40 in Brunei Darussalam, the incidence of myocardial infarction is associated with factors such as smoking habits, hypertension, diabetes, and hyperlipidaemia. This highlights the need for immediate attention, preventive measures, and the development of a comprehensive public health strategy aimed at mitigating the impact and enhancing the cardiovascular health of the younger population.

#### **P9: CARDIAC ANOMALIES IN ANOREC-**

#### **TAL MALFORMATION: A BRUNEIAN PERSPECTIVE.**

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**Introduction:** Anorectal malformation (ARM) is a congenital condition affecting approximately 1 in 1350 births in Brunei, a rate notably higher than the global average of 1 in 3000 to 5000 births. Existing literature indicates that around half of individuals with ARM may have associated cardiac anomalies, with 25-30% necessitating surgical intervention. Mortality rates within this subgroup range from 10 to 20%. This study aims to elucidate the prevalence of these anomalies within the Bruneian population.

**Methods:** A retrospective observational study, conducted from January 2016 to December 2022 at Brunei's sole Paediatric Surgery tertiary care centre, involved a meticulous review of medical records for all ARM cases born or transferred to RIPAS Hospital. Emphasis was placed on identifying associated cardiac anomalies and evaluating their clinical significance.

**Results:** Among the 34 cases of ARM examined, 10 cases (29%) demonstrated concurrent cardiac anomalies. These anomalies encompassed a spectrum including patent ductus arteriosus (PDA), atrial septal defects (ASD), ventricular septal defects (VSD), tricuspid atresia, and pulmonary atresia. Notably, 4 of these cases (12%) were classified as significant, necessitating surgical intervention. Mortality attributable to cardiac anomalies was noted in 2 cases (6%).

**Conclusion:** Our findings offer a unique perspective on the co-occurrence of cardiac anomalies in individuals with anorectal malformations, diverging from the prevailing literature. Only 29% of our cohort exhibited associated cardiac anomalies, with merely 12% requiring surgical intervention. This fig-

ure stands in contrast to established global rates. Notably, despite the heightened prevalence of ARM in Brunei, the incidence of associated significant cardiac anomalies remains lower. These results underscore the significance of localised studies in comprehending demographic variations in congenital anomalies. They also instigate further inquiry into potential genetic or environmental factors influencing this distinctive prevalence pattern in Brunei. This study forms a vital cornerstone for individualised clinical strategies in the management of patients with anorectal malformations within this specific population.

#### **P10: CORONARY ARTERY ANEURYSM IN KAWASAKI DISEASE: A CASE REPORT.**

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**Background:** Kawasaki disease (KD) is a medium vessel vasculitis which predominantly affected children aged <5 years. It is an acute, self-limiting febrile illness. Coronary artery aneurysm (CAA) occurs in 0.3 to 0.4% of patients with KD. We report a rare case of Kawasaki disease in a young male patient with coronary artery aneurysm.

**Case Presentation:** A 25 year old man was diagnosed with Kawasaki disease at the age of 8. Subsequently, Coronary computed tomography angiogram depicted 12mm CAA of the left main coronary artery and 14.5mm CAA of the right coronary artery with calcification. Warfarin and clopidogrel were initially started. Due to his plan to travel overseas for studies, warfarin was switch to dabigatran recently. He was under Pediatrics care at RIPAS Hospital then transferred to the Adult Congenital Heart Disease clinic.

**Conclusion:** KD could lead to severe complications including CAA and thromboembolic

occlusions, which can be fatal. Thus, long-term follow up and management of coronary artery lesions are essential as it has prognostic relevance for subsequent outcomes.

#### **P11: FACTORS AND OUTCOMES OF PATIENTS WITH CORONAVIRUS DISEASE 2019 ON EXTRACORPOREAL MEMBRANE OXYGENATION IN INTENSIVE CARE UNIT. A CASE SERIES.**

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**Background:** In the intensive care unit (ICU), patients with Coronavirus disease 2019(COVID-19) developed acute hypoxemic respiratory failure of varying severity and its incidence can be as high as 67%. According to the World Health Organization (WHO), one of the components of COVID-19 management is supportive care. Extracorporeal membrane oxygenation (ECMO) is part of the supportive care available in our healthcare setting.

**Objectives:** To determine the outcomes and risk factors that contribute to the survival of patients on ECMO.

**Study design and methods:** This is a retrospective study that involved patients who had COVID-19 infection and were supported by ECMO, admitted to our National Isolation Center (NIC) ICU, Brunei Darussalam from August 2021 until January 2022

**Results:** Total of 12 patients, one of which had to be excluded in view of mortality within 24 hours of initiation of ECMO. Overall mortality was 82%. Mean age was 41.7 +/- 10.1 years old. There were two survivors who were tracheostomized and eventually decannulated. One patient was fully vaccinated. 45% of patients had hypertension, 54% of patients had diabetes Mellitus and 18% were morbidly obese. Ten patients had percentage more than 76% based on the Respiratory ECMO Survival Prediction (RESP) score but only sur-

vived. High-resolution computerized tomography (HRCT) scanning was only performed on two patients to assess the extension of lung damage by using HRCT scoring system.

**Conclusions:** Based on the cases reviewed, we concluded that using scoring system like RESP score will not be accurate in predicting survival in COVID-19 patients. The importance of HRCT scanning of the lungs to assess the extension of lung damage before the initiation of ECMO and the HRCT score generated from HRCT scanning may have potential value in the prognostication following ECMO initiation. Further studies to assess the role of HRCT score as a prognostic factor in initiating ECMO are suggested.

## **P12: JUDICIOUS PRESCRIPTION OF WARFARIN IN ELDERLY WITH GERIATRIC SYNDROME: RISK VERSUS BENEFIT.**

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**Background:** Atrial fibrillation (AF) accounts for 20% of all ischemic strokes and carries a 5-fold risk of stroke while warfarin reduces it by 67% [1]. However, achieving effective and safe warfarin therapy is challenging especially among elderly with geriatric syndromes. CHA2DS2-VASc score (Ischemic stroke risk score) and HAS-BLED score (Estimate the risk of major bleeding in patients receiving anticoagulation) are two widely used clinical scores to weigh the risk and benefit of warfarin therapy and to guide the initiation of warfarin therapy.<sup>1</sup> In the elderly, in addition to the two clinical scores, geriatric syndromes such as falls, need for assistance with activities of daily living (ADLs) or instrumental ADLs (IADLs), cognitive impairment, and incontinence are critical in considering warfarin therapy.

A study of 779 elderly (mean age of 80 years) patients with AF (mean CHA2DS2-

VASc score = 4), 82% had at least one geriatric syndrome, leading to lower warfarin prescribing. The guidelines recommend anticoagulant use in 97% of participants, but after accounting for geriatric syndromes, prescribing decreased to only 65% of participants, and the prescribing rate decreased by 3.7% with each additional geriatric syndrome. Prescription rates were even lower in participants with ADL dependence, IADL dependence, and dementia.<sup>2</sup>

The risk of ischemic stroke is higher in older people with geriatric syndromes, suggesting a greater benefit of warfarin in older people with AF and geriatric syndromes. However, anticoagulants are the leading cause of 60% of ED elderly visits for adverse drug reactions.<sup>3</sup> In addition, the potential benefit of warfarin in the elderly is limited because geriatric syndromes are associated with shortened life expectancy.<sup>2</sup>

In addition, warfarin therapy is associated with numerous complex issues, such as patient education, diet-drug interactions, patient adherence to medication, frequent INR monitoring with warfarin dose adjustment, and periodic reassessment of the risk-benefit ratio of warfarin to account for the unstable clinical condition of the elderly.

Socioeconomic status and patient willingness to engage are also important factors, as warfarin therapy requires a large investment of time and additional costs, such as transportation to frequent clinic visits.<sup>4</sup>

**Conclusion:** Clinical judgement and individualized treatment are crucial for elderly patients, considering geriatric syndromes, socioeconomic status, and patient commitment. New anti-coagulants like direct thrombin (dabigatran) and factor Xa inhibitors (rivaroxaban, apixaban) which will overcome many of the drawbacks of warfarin, is a step forward, with future research aiming for affordability.



## References

- 1: Manolis AJ, Poulimenos LE (2013). Prevention of Stroke by Anti-thrombotic Therapy in Patients with Atrial Fibrillation. *Journal of atrial fibrillation*;5(5):732. <https://doi.org/10.4022/jafib.732>.
- 2: Shah SJ, Fang MC, Jeon SY, Gregorich SE, Covinsky KE. Geriatric Syndromes and Atrial Fibrillation: Prevalence and Association with Anti-coagulant Use in a National Cohort of Older Americans. *Journal of the American Geriatrics Society*. 2021;69(2):349–356. <https://doi.org/10.1111/jgs.16822>.
- 3: Shehab N, Lovegrove MC, Geller AI, Rose KO, Weidle NJ, Budnitz DS. US Emergency Department Visits for Outpatient Adverse Drug Events, 2013–2014. *JAMA*. 2016;316(20):2115–2125. <https://doi.org/10.1001/jama.2016.16201>.
- 4: urwitz JH. Warfarin in Complex Older Patients: Have we Reached a Tipping Point?. *Journal of the American Geriatrics Society*. 2017;65(2):236–237.

### **P13: THE IMPORTANCE OF T2 MRI AND SERUM FERRITIN LEVELS IN ASSESSING IRON OVERLOAD AND THEIR CORRELATION IN NON-TRANSFUSION DEPENDENT THALASSEMIA (NTDT).**

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**Background:** Iron overload is a significant concern in thalassemia patients, even in those who do not require regular blood transfusions. Non-transfusion-dependent thalassemia (NTDT) encompasses a spectrum of thalassemia intermedia variants and poses unique challenges in iron management. T2 MRI, which measures the transverse relaxation time of tissues, is sensitive to changes in iron concentration and distribution and has been shown to detect iron overload even when ferritin levels are within the normal range. It provides a more direct assessment of iron in organs such as the heart and liver,

which are commonly affected by NTDT. However, ferritin, although widely available and less expensive, has limitations. It can be influenced by various factors, such as inflammation, liver disease, and infections, leading to inaccurate assessments of iron overload.

**Aim:** This study aimed to investigate the prevalence and severity of iron overload and the relationship between T2 MRI and ferritin levels in NTDT patients.

**Methods:** We analyzed serum ferritin (SF) and cardiac T2\* in 45 NTDT cases in this retrospective cross-sectional study attended in an adult thalassemia clinic at RIPAS Hospital between 2013 and 2023.

**Results:** A total of 45 adult patients were analyzed. The median age was 45 (16–64) years with 22 males and 23 females. The median serum ferritin level was 1404.95 (132–3840) ng/ml, and the median cardiac T2\* was 36.84 (22.7–56) ms. No patients had cardiac T2\* < 20 ms. The median cardiac iron value was 0.59 (0.33–1.00) mg Fe/g dry weight (dw). No patient had cardiac iron > 1 mg Fe/g dry weight (dw). Five cases had > 3000 ferritin, nine had > 2000, and 18 had > 1000. In our study, there was no significant correlation between cardiac iron overload and serum ferritin levels. Overall, no significant cardiac iron overload was also observed in cases of NTDT.

**Conclusion:** T2 MRI can provide insights into organ-specific iron accumulation, allowing for tailored treatment strategies, while ferritin levels remain valuable as a cost-effective tool for routine monitoring. Our study supports the findings that NTDT patients have a low prevalence of cardiac iron overload and T2 MRI doesn't correlate with serum ferritin levels in non-transfusion-dependent thalassemia.

### **P14: CARDIAC MAGNETIC RESONANCE IMAGING T2\* AND CARDIAC COMPLICATIONS IN TRANSFUSION DEPENDENT THALASSEMIA PATIENTS UNDER ADULT**

## **HAEMATOLOGY UNIT IN BRUNEI.**

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**Introduction:** Magnetic Resonance Imaging T2\*(MRI T2\*) is used to assess iron overload in the heart. This noninvasive quantification of iron overload helps in identifying patients at high risk of cardiac iron overload complications. The objective of this study is to evaluate cardiac MRI T2\* and cardiac complications amongst transfusion dependent thalassemia (TDT) patients under Adult Hematology unit at RIPAS Hospital, Brunei.

**Method:** Retrospective study of cardiac MRI T2\* done between 2016 to 2023 on 130 TDT patients under Adult Hematology unit at RIPAS Hospital was conducted. Specific analysis of data on TDT patients who had MRI T2\* < 10ms (high-risk group) was performed.

**Results:** A total of 207 MRI T2\* and 130 TDT patients were included in this study. 73 TDT patients had more than one MRI T2\*. The median age of 130 TDT patients was 48 (14-62) years. 69 patients were male and 61 patients were female. Based on the cardiac MRI T2\*, TDT patients were classified into 3 groups, T2\*<10ms (high-risk), 10-20ms (medium-risk) and >20ms (low-risk). Out of 130 TDT patients, 87 patients (67%) had T2\* > 20ms, 16 patients (12%) had T2\* > 10-20ms and 27 patients (21%) had T2\* < 10ms. In the sub-group of patients with T2\* < 10ms (27 patients), 13 were male and 14 were female. The median age was 29 (17-42) years. The median cardiac T2\* was 7.6 ms (2.4-10) and the median serum ferritin (SF) level was 16714 ng/ml (1181-17895). In this sub-group, cardiac complications occurred in 14 patients (52%). Arrhythmias occurred in 6 patients (22%), heart failure in 2 patients (7%), pulmonary hypertension in 8 patients (30%). Death occurred in 11

patients (41%). All patients were on iron chelation therapy, 22 patients (81%) on combined therapy (subcutaneous Deferoxamine and oral Deferiprone or Deferasirox) and 5 patients (19%) on monotherapy (oral Deferasirox or Deferiprone).

**Conclusion:** Our study identified about quarter of TDT patients had T2\* < 10ms. About half of these patients had cardiac complications and the majority are on combined iron chelation therapy. This highlights importance of Cardiac MRI T2\* in identification of patients at high risk of cardiac complications and escalation of therapy including intensification of chelation therapy and referral to cardiologist with expertise in iron related cardiac disease as well as improving adherence to iron chelation therapy.

## **P15: AN AUDIT ON THE MANAGEMENT OF BLOOD PRESSURE CONTROL IN BERAKAS HEALTH CENTRE'S PATIENTS.**

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**Background:** Hypertension, a significant modifiable risk factor for cardiovascular and kidney diseases, has high prevalence in the world and Brunei Darussalam. The aim of this audit was to evaluate the management of hypertension in accordance with the 2<sup>nd</sup> edition of Brunei Darussalam National Hypertension guidelines.

**Method:** The study was conducted at Berakas Health Centre in Brunei. Data was collected retrospectively for patients diagnosed with ICD 10 code i10 using intranet and BRUHIMS. The analysis focused on several key standards, criteria and objectives.

**Results:** Blood Pressure Control: The Audit aimed for 70% of hypertensive patients to achieve controlled blood pressure (BP) according to specific thresholds based on cardi-

ovascular risk. 62.5% of patients met this target. Audit highlighted the challenges of time constraints during consultations, affecting the ability to explain the benefits of dose adjustment and medication compliance to the patients. Medication Compliance Inquiry: The Audit set a target of 80% for doctors to ask patients about their medication compliance. Results showed a compliance inquiry rate of 85%. Lifestyle Modifications Explanation Audit standard set at 80% of patients to receive advise on lifestyle modification. Only 70.5% of patients received advise on lifestyle changes possibly due to time constraint and missed documentation. ACEI/ARB Prescription for T2DM Patients: Audit standard set at 80% patients with both hypertension and Type 2 diabetes mellitus (T2DM) be prescribed ACEI/ARB medication. Result showed 95.2% were on ACEI/ARB. Target met.

**Conclusions and Recommendations:** In conclusion, while some standards were met, such as medication compliance inquiries and ACEI/ARB prescriptions for diabetic patients, others, like lifestyle modification explanations and blood pressure control, fell short. The study also highlighted the importance of tracking appointments and patient communication more effectively to ensure that recommended guidelines are consistently followed. The study identified time constraints as a major factor affecting comprehensive patient education and suggested various recommendations: 1: Scheduling more time for consultations, particularly for diabetic patients with hypertension, to allow for detailed discussions about medication, lifestyle changes and potential complications. 2: Facilitating appointments for these patients in specific clinics or giving two time slots to accommodate comprehensive discussions. 3: Creating checklists for doctors to ensure that important topics, such as medication compliance and lifestyle changes, are consistently addressed during consultations. 4: Providing information pamphlets on diet and lifestyle to patients to reinforce advice given during consultations.

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