

Abstracts of Dissertations

December 2017 Exit Assessment Exercise

A RETROSPECTIVE COHORT STUDY ON THE PROGNOSTIC SIGNIFICANCE OF EARLY OCCURRENCE OF VENTRICULAR ARRHYTHMIAS IN CHINESE PATIENTS WITH ST-SEGMENT ELEVATION MYOCARDIAL INFARCTION

Dr Chan Kwok Wai, Department of Medicine, Yan Chai Hospital (December 2017 Cardiology Exit Assessment Exercise)

Background Studies on the prognostic significance of early ventricular fibrillation or tachycardia complicating ST elevation myocardial infarction are conflicting and lack of Asian data.

Objective The purpose of study was to investigate whether early ventricular fibrillation or tachycardia within 48hrs of ST elevation myocardial infarction and other clinical factors have any prognostic significance on defined primary and secondary endpoints

Method Patients admitted to our units for STEMI complicating VF/VT from 2001 to 2015 who survived to discharge were retrospectively reviewed as study group. Patients with STEMI without VF/VT are selected by correlation of age, sex and myocardial infarction location as control group.

Results A total of 84 patients (92.9% male with mean age 57.7+/-8.2 years) were included in the study. Our study suggested that early VT/VF/sudden cardiac death did not predict the future occurrence of VT/VF. No independent predictors were identified for these primary endpoints. Diabetes (hazard ratio 27.77, 95% confidence interval 1.97-390.95, P= 0.014) and acute pulmonary edema (hazard ratio 30.86, 95% confidence interval 2.03-468.55, p=0.013) were shown to be independent predictors of heart failure hospitalization.

Conclusion This study suggested that Chinese patients with early VT/VF within 48 hours complicating STEMI showed no statistical significance in predicting a poorer prognosis in terms of recurrent VT/VF or sudden cardiac death, MACE, cardiovascular death, recurrent MI, heart failure hospitalization and total mortality.

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ACUTE KIDNEY INJURY IN NEUROCRITICAL PATIENTS - INCIDENCE, CLINICAL CHARACTERISTICS, AND OUTCOME A SINGLE CENTER RETROSPECTIVE COHORT STUDY

Dr Kong Hoi Yan Harriet, Department of Intensive Care, Pamela Youde Nethersole Eastern Hospital (December 2017 Critical Care Medicine Exit Assessment Exercise)

Background Neurocritical patients are common in intensive care unit (ICU) and are associated with significant mortality and morbidities. Their incidence of acute kidney injury (AKI) remains under-investigated. Patients with AKI have higher mortality in general and it is unknown whether this association holds true for neurological patients. This study aims to investigate the incidence of AKI in neurological patients, its risk factors, and its impact on mortality.

Method In this retrospective single center cohort study, patients with a primary neurological diagnosis admitted to our ICU from 1st January 2011 to 31st December 2013 were recruited. AKI was defined and staged by the Kidney Disease Improving Global Outcome (KDIGO) criteria. Baseline characteristics and clinical data were collected and compared between AKI and non-AKI group. Independent risk factors for AKI and 90-day mortality were analyzed using logistic regression and cox regression analysis respectively.

Results Out of 724 patients, 43% developed AKI. Hypovolemia was the most common cause. Disease severity score, vasopressor use, mechanical ventilation, bodyweight, and emergency admission were independently associated with AKI in the multivariate regression analysis. AKI stage 2 and 3 are independent risk factors for 90-day mortality. In the subgroup analysis for intracranial hemorrhage (ICH) and subarachnoid hemorrhage (SAH), the incidences of AKI were 59.8% and 43.3% respectively. AKI was independently associated with higher bodyweight and mechanical ventilation. In SAH, stage 3 AKI was associated with 90-day mortality after adjustment. Full renal recovery was observed in 80.4% of AKI.

Conclusion AKI is common in neurocritical patients and it independently associates with mortality.

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CLINICAL SPECTRUM AND OUTCOMES OF INFECTIONS OF CENTRAL NERVOUS SYSTEM ADMITTED TO INTENSIVE CARE UNIT: A RETROSPECTIVE STUDY

Dr Mak Kwok Shing, Department of Anesthesia and Intensive Care, Tuen Mun Hospital (December 2017 Critical Care Medicine Exit Assessment Exercise)

Background Central nervous system (CNS) infections are serious infectious conditions. Life-threatening complications, which can occur at any stages, often require life supporting measures in the intensive care unit (ICU) and carrying significant mortality and morbidities.

Objectives To evaluate the clinical characteristics and outcomes of patients with CNS infections, and to investigate independent predictors for adverse outcomes in critical care setting. Adverse outcomes included hospital mortality and unfavorable functional outcome for survivors which was defined by modified Rankin scale (mRS) score 4 to 6 one year after hospital discharge.

Design Retrospective cohort study.

Setting ICUs of two acute general hospitals in the New Territories West cluster.

Patients Adult patients (aged ≥ 18 years) with CNS infections admitted to the ICUs of Tuen Mun Hospital and Pok Oi Hospital from January 2006 to December 2015.

Results This study entailed 99 patients. Etiologies of CNS infections included meningitis (n=54, 55%), encephalitis (n= 19, 19%) and intracranial abscess (n=26, 26%). The rates of hospital mortality and an unfavorable functional outcome one year after discharge were 33% (33 out of 99 patients) and 26% (17 of 65 patients, missing data in one survivor) respectively. By Cox regression analysis, a high modified mortality in emergency department sepsis (MEDS) score (hazard ratio HR 1.135, 95% confidence interval CI 1.036-1.243, p=0.007), higher baseline serum lactate dehydrogenase (LDH) (HR 1.001, 95%CI 1.001-1.002, p= 0.001) and the presence of hydrocephalus (HR 2.320, 95%CI 1.029-5.230, p= 0.042) were the independent factors associated with mortality. Among the 65 survived patients, logistic regression analysis showed delayed collection of cerebrospinal fluid (CSF) sample more than 30 hours following attendance at emergency department (ED) (odd ratio OR 6.726, 95%CI 1.689 – 27.786, p= 0.007) and need for tracheostomy (OR 12.270, 95% CI 1.640 - 91.794, p= 0.015) were the independent factors associated with an unfavorable functional outcome one year after discharge.

Conclusion CNS infections, characterized by complicated CNS and systemic pathophysiological disturbances, carry high mortality and adverse outcomes despite interventions in critical care setting. A higher modified MEDS score and baseline LDH value may predict mortality and facilitate early recognition of high risk patients. Delayed collection of CSF sample delays the diagnosis and effective antimicrobial treatment hence adversely influenced the post-discharge functional outcome. Need for tracheostomy in patients on

prolonged mechanical ventilation underlies significant neurological injury. As the outcomes were generally poor, the decision to proceed with tracheostomy and its timing should be made on a careful individual basis.

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CONTINUOUS LACTATE MONITORING IN SEPTIC SHOCK

Dr Wong Alfred Sai Kuen, Department of Adult Intensive Care, Queen Mary Hospital (December 2017 Critical Care Medicine Exit Assessment Exercise)

Background Hyperlactaemia in septic shock is known to be associated with higher mortality. Both static and dynamic lactate indices have prognostication value, but there is no general agreement with respect to the time points for lactate sampling. Intravascular microdialysis allow continuous monitoring of lactate levels. While it has been studied in cardiac surgery, its application in septic shock has yet to be examined. We investigate the mortality predictive ability with this novel technology.

Methods This was a single centre, prospective observational study conducted at a university-affiliated tertiary care adult Intensive Care Unit (ICU). Consecutive adult medical patients with sepsis admitted to the ICU were screened, and those with septic shock, as defined by Sepsis-3, were recruited. Patients with other causes of hyperlactaemia were excluded. Central venous catheter with intravascular microdialysis was inserted on all patients for continuous lactate monitoring. We assessed the relationship between both static and dynamic lactate indices with 30-day mortality.

Results 34 patients with septic shock were recruited, and 11 patients (32%) died at day 30. Survivors had lower regression coefficients of lactate (LACLIN, -1.720 vs 4.100, $p < 0.001$) and its natural logarithm (LACEXP, -0.539 vs 0.569, $p < 0.001$) against time, higher 24 hour lactate clearance (LAC Δ 24%, 33.13% vs -27.83%, $p = 0.007$), and lower 12 and 24 hour maximum lactate concentration (LACmax12, 4.269 mmol/L vs 8.302 mmol/L, $p = 0.021$; LACmax24, 4.811 mmol/L vs 10.266 mmol/L, $p = 0.016$) compared to non-survivors. LACEXP (AUROC 0.937, 95% CI 0.860-1.000), LACLIN (AUROC 0.917, 95% CI 0.817 - 1.000), and Δ LAC24% (AUROC 0.841, 95% CI 0.644 - 1.000) were all good predictors for 30-day mortality. Multivariate analysis found that LACEXP was the only index independently correlated to mortality status (OR 63.7, $p = 0.047$). Bland-Altman analysis showed a bias \pm limits of agreement of $-0.42 \text{ mmol/L} \pm 1.1 \text{ mmol/L}$.

Conclusion Lactate indices measured by continuous lactate monitoring has significant independent predictive value for mortality in septic shock. The intravascular microdialysis technique provides acceptable accuracy for continuous monitoring of lactate levels in septic shock.

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STEVENS-JOHNSON SYNDROME AND TOXIC EPIDERMAL NECROLYSIS: A 13-YEAR REVIEW OF PATIENTS MANAGED IN A TERTIARY REFERRAL CENTER IN HONG KONG.

Dr Cheung Man Tung Christina, Department of Medicine & Therapeutics, Prince of Wales Hospital (December 2017 Dermatology & Venereology Exit Assessment Exercise)

Background Stevens-Johnson syndrome (SJS) and Toxic epidermal necrolysis (TEN) are uncommon but severe mucocutaneous reactions, characterised by epidermal necrosis and detachment. Though being largely described worldwide, local data is scarce. No therapeutic agents were shown to be beneficial unequivocally. The efficacy of intravenous immunoglobulins (IVIG) was not well studied in Hong Kong.

Objectives We sought to study the epidemiology, disease characteristics and clinical course, etiology, treatment regime, morbidity and mortality of SJS/ TEN in Hong Kong. We also evaluated the efficacy of IVIG in reducing mortality of SJS/ TEN.

Methodology This is a retrospective cohort study. All hospitalised patients diagnosed with SJS/ TEN and managed in the Prince of Wales Hospital (PWH) from 1st January 2004 to 31st December 2016 were included for analysis. The efficacy of IVIG was evaluated by comparing the actual in-hospital mortality with the predicted in-hospital mortality. The latter was calculated based on severity-of-illness score for TEN (SCORTEN) prognostic score.

Results There were a total of 102 cases of SJS/ TEN in 100 patients over the 13-year study period, of which 44.1% were SJS, 24.5% were SJS-TEN overlap, and 31.4% were TEN. The overall annual incidence was 6.04 cases per million. The mean age of onset was 48.9 years. A female predominance was observed with a female to male ratio of 1.4:1. The average maximal body surface area of epidermal necrosis was 23.2%. Around one third of cases (36.3%) required Burns or Intensive Care Unit admission. Over half of the cases (52.9%) were complicated by sepsis, and 17.6% developed multiorgan failure or disseminated intravascular coagulation. The average length of stay in PWH was 24.4 days. The cause of SJS/ TEN was attributed to a drug in 92.1% of cases, of which 82.8% were due to anti-convulsants (especially carbamazepine and phenytoin), allopurinol, antibiotics (especially penicillin group), or analgesics (especially non-steroidal anti-inflammatory drugs). The majority of cases received either IVIG therapy (50%) or best supportive care alone (36.3%). The overall in-hospital mortality rate of our cohort was 22.5%. Major causes of death were multiorgan failure and/or fulminant sepsis (78.2%). Among those treated with IVIG (n = 51), the actual in-hospital mortality observed was 13, while the predicted in-hospital mortality based on SCORTEN was 14.24. The standardised mortality rate (SMR) was 0.91 [95% confidence interval (CI): 0.49 – 1.56, p = 0.88.]

Conclusion Our study shows that SJS and TEN, despite being uncommon diseases in Hong Kong, do carry significant morbidity and mortality. The use of IVIG in our cohort was not statistically shown to improve survival. The management of SJS/ TEN should focus on early withdrawal of offending agents, best supportive treatment by a dedicated multidisciplinary team led by dermatologists, and appropriate transfer to Burns or Intensive Care Unit.

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EVALUATION OF IMAGING FOR LOCALIZATION IN PRIMARY HYPERPARATHYROIDISM: A PILOT DIAGNOSTIC TEST STUDY

Dr Chow Lai Man Vivian, Department of Medicine and Geriatrics, Princess Margaret Hospital (November 2017 Endocrinology, Diabetes and Metabolism Exit Assessment Exercise)

Background Pre-operative localization in patients with primary hyperparathyroidism is of value, particularly if focused parathyroidectomy is planned. Various imaging modalities are available, including the newly introduced sestamibi single photon emission computed tomography (MIBI/SPECT) and sestamibi single photon emission computed tomography associated with computed tomography scintigraphy (MIBI/SPECT-CT). Local data on diagnostic values of MIBI/SPECT and MIBI/SPECT-CT is lacking.

Objectives The aim of this study was to evaluate and compare the sensitivities and positive predictive values of MIBI/SPECT and MIBI/SPECT-CT to other imaging modalities in patients with primary hyperparathyroidism. The demographic and clinical characteristics of negative and positive parathyroid localization studies were compared. Secondly, the clinical characteristics of patients with primary hyperparathyroidism undergoing parathyroidectomy would also be evaluated.

Methods One hundred and twenty-one subjects (mean age 57.5 ± 12.2 years; female to male ratio 2.2:1), who were followed up in medical specialty outpatient clinic in Princess Margaret Hospital, with biochemical diagnosis of primary hyperparathyroidism, followed by pre-operative imaging studies for localization and subsequently underwent parathyroidectomy between January 2005 and December 2016, were reviewed. Clinical characteristics,

pre-operative investigations and operative findings were collected. The results of various imaging modalities were assessed based on surgical and histopathological findings. The sensitivities and positive predictive values of various imaging modalities were analyzed.

Results A total of 128 pathological parathyroid lesions in 121 subjects were reviewed. Two hundred and twenty pre-operative imaging studies were performed (70 USG, 19 CT, 23 MIBI, 67 MIBI/SPECT and 41 MIBI/SPECT-CT). One hundred and thirteen subjects (93.4%) had single glandular disease. The overall sensitivities of USG, CT, MIBI, MIBI/SPECT and MIBI/SPECT-CT were 55.9 %, 60%, 81%, 90.8% and 85% respectively; the overall positive predictive values were 95%, 69.2%, 89.5%, 96.7% and 97.1% respectively. MIBI/SPECT had a higher sensitivity than USG or CT and a higher positive predictive value than CT. MIBI/SPECT-CT had a higher sensitivity than USG and a higher positive predictive value than CT. After excluding multiglandular diseases, MIBI/SPECT and MIBI/SPECT-CT had higher sensitivities and positive predictive values than CT; MIBI/SPECT had a higher sensitivity than MIBI. More thyroid nodular diseases were found in inaccurate USG and MIBI/SPECT-CT; more multiglandular diseases were found in inaccurate MIBI/SPECT and MIBI/SPECT-CT; greater number of superiorly located parathyroid lesions were found in inaccurate MIBI and MIBI/SPECT-CT. Favorable factors associated with correct localization included heavier parathyroid glands and higher calcium levels for USG scan only. ix

Conclusion MIBI/SPECT and MIBI/SPECT-CT are highly accurate in localization for primary hyperparathyroidism. They were superior to USG in terms of overall sensitivities and CT in terms of overall positive predictive values. In addition, after excluding multiglandular diseases, they were more sensitive than CT; MIBI/SPECT was also more sensitive than MIBI. Factors associated with incorrect localization included thyroid nodular diseases in USG and MIBI/SPECT-CT; multiglandular diseases in MIBI/SPECT and MIBI/SPECT-CT; superiorly located parathyroid lesions in MIBI and MIBI/SPECT-CT. Favorable factors associated with correct localization included heavier parathyroid glands and higher calcium levels for USG scan only.

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IDENTIFICATION OF PREOPERATIVE RISK FACTORS PREDICTING RENAL IMPAIRMENT AFTER UNILATERAL ADRENALECTOMY IN PATIENTS WITH PRIMARY ALDOSTERONISM

Dr Keung Kai Man, Department of Medicine and Geriatrics, Kwong Wah Hospital (November 2017 Endocrinology, Diabetes and Metabolism Exit Assessment Exercise)

Introduction Primary aldosteronism (PA) is one of the most common causes of secondary hypertension. It is characterized by an autonomous secretion of aldosterone leading to salt and fluid retention, resulting in hypertension. Biochemically it is characterized by an elevated aldosterone level, suppressed plasma renin level, and increased urinary potassium excretion with or without hypokalemia. Despite international guideline advocating appropriate screening of at-risk groups, such as patients with young onset hypertension or hypertension with hypokalemia, for early diagnosis and treatment, PA remained underdiagnosed in Hong Kong.

Apart from damage directly mediated by hypertension, it is recognised that aldosterone has additional independent deleterious effect on end organs such as kidney and heart. Studies have shown that PA would lead to increase in left ventricular mass and increased prevalence of myocardial fibrosis. More prevalent microalbuminuria was shown in PA patients than in patients with primary hypertension. Partial recovery of the microalbuminuria was shown when appropriate treatment was initiated.

Standard of care for PA includes appropriate case detection, confirmation of autonomous secretion of aldosterone, and subsequent further subtyping. Unilateral PA from autonomous secretion of aldosterone-producing adenoma is readily treatable by laparoscopic resection of the lesion. However, deterioration in renal function is increasingly noted after operation ,

when the effect of glomerular hyperfiltration is removed, unmasking the underlying kidney impairment. Previous studies suggested risk factors such as age, number of antihypertensive agents, estimated duration of hypertension, and aldosterone-renin ratio (ARR) to be associated with postoperative (PO) renal impairment.

In the current study, we would like to establish local data on PO renal impairment after unilateral adrenalectomy for PA, and study on risk factors associated with this condition.

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LONG TERM FOLLOW-UP OF CHINESE PATIENTS WITH MODERATE-TO-SEVERE AND SIGHT-THREATENING GRAVES' OPHTHALMOPATHY IN TWO HOSPITALS IN HONG KONG

Dr Wong Ting Ting Angel, Department of Medicine & Geriatrics, Tuen Mun Hospital (November 2017 Endocrinology, Diabetes and Metabolism Exit Assessment Exercise)

Background Long-term outcomes of treatment for Chinese patients with moderate-to-severe and sight-threatening Graves Ophthalmopathy (also known as Graves Orbitopathy) was not reported in the past.

Method We have followed up 58 patients with moderate-to-severe and sight-threatening Graves Ophthalmopathy from two tertiary hospitals in Hong Kong, for a median of 45 months (range 26-65 months). All patients received intravenous glucocorticoid treatment while some received orbital irradiation and/ or decompressive surgery. The primary outcomes were the visual outcomes at week 0, week 12, year 2 and year 4 after initiation of intravenous glucocorticoid treatment and the adverse effects from treatment. The secondary outcomes were the need for re-treatment with intravenous glucocorticoid and the analysis on factors that affected visual outcomes. We analysed a special group of patients who did not follow the weekly protocol of intravenous glucocorticoid and the group of patients who used third-line agents.

Results Twenty three patients were followed up till year 4. Eighteen out of 20 patients showed improvement in best-corrected visual acuity in either eye at year 4, with median of improvement +0.16 (IQR 0.00-0.33) (n=40 eyes). Seventeen out of 23 patients showed improvement in intraocular pressure in Page 6 of 83 either eye at year 4, with median of improvement 2.0 mmHg (IQR -2.0 to +3.0) (n=44 eyes). Diplopia in Gorman score improved in 8 out of 18 patients at year 4, with median of improvement 0 scores (IQR 0 to 1) (n=18 patients). Nine out of 15 patients had proptosis improved in either eye at year 4, with median of improvement 0.0 mm (IQR 0.0-1.0) (n=30 eyes). The most common adverse effect from intravenous glucocorticoid was hyperglycaemia, noted in 7 out of 58 patients. Intravenous glucocorticoid was well-tolerated in patients in this group.

Conclusion Intravenous glucocorticoid administered in pulses was an effective and safe treatment for Hong Kong Chinese patients with moderate-to-severe and sight-threatening Graves Ophthalmopathy.

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PREVALENCE AND CLINICAL CHARACTERISTICS OF PATIENTS WITH ALDOSTERONE AND CORTISOL CO-SECRETING ADRENAL ADENOMA (A/CPA)

Dr Yu Kit Yu, Department of Medicine and Geriatrics, Kwong Wah Hospital (November 2017 Endocrinology, Diabetes and Metabolism Exit Assessment Exercise)

Introduction Primary aldosteronism(PA) is the most common cause of secondary hypertension. It has been reported to account for to 5-10% of hypertensive patients (1, 25-27). Adrenal adenoma which co-secretes aldosterone and cortisol has been described in both in-vitro (2) and in vivo (3) studies. Up to 21 % of patients with PA showed concomitant

cortisol and aldosterone hypersecretion had been reported by a Japanese group in a retrospective study (20). Most patients with such lesions have biochemical evidence of aldosteronism, but minimal features of cortisol excess. Recognition of A/CPA is clinically important to avoid misinterpretation of adrenal venous sampling (AVS) results, and Addisonian crisis after unilateral adrenalectomy.

Aim To identify the prevalence and clinical characteristics in patients with aldosterone and cortisol co-secreting adrenal adenoma

Method Consecutive patients with primary aldosteronism (PA), diagnosed with a morning plasma Aldosterone Renin Ratio (ARR) > 30 (in conventional units), confirmed by either concomitant plasma aldosterone level > 550 pmol/L or a post saline infusion level of > 140 pmol/L, were recruited. Screening for autonomous cortisol secretion by: 1) 1mg overnight dexamethasone suppression test (1mg-DST), 2) 24-hour urine for free cortisol (24h-FC), 3) late night salivary cortisol (LNSC) and 4) morning ACTH were performed in these recruited patients. CT scan of adrenal glands, AVS and iodocholesterol adrenal scan (in selected patients) were performed for localization of hormone hypersecretion. The demographics and the investigation results were analyzed with SPSS version 13.0.

Results The prevalence of A/CPA among patients with PA and APA were 7.7% (10/130) and 10.3% (10/97) respectively. These patients were middle age (mean age 54.8±8.7) women (70% female) without any signs and symptoms of hypercortisolism. Apart from a larger adenoma size on CT (2.3±1.0 cm in A/CPA versus 1.3±0.5cm in APA), these patients showed similar metabolic profile and biochemical results with PA patients. Discordant AVS results with the true diagnosis were found in 80% of the A/CPA patients undergoing AVS.

Conclusion A/CPA is prevalent in patients with unilateral aldosterone hypersecretion. Screening for autonomous cortisol secretion with overnight dexamethasone suppression test should be considered when the size of adrenal adenoma is greater than 1 cm on CT scan, or before AVS to avoid misinterpretation of AVS results and spares the patient from post-operative Addisonian crisis with appropriate perioperative steroid use.

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SAFETY AND EFFICACY OF ENDOSCOPIC RETROGRADE CHOLANGIOPANCREATOGRAPHY IN NONAGENARIANS: ELDERLY PATIENTS AGED 90 OR ABOVE

Dr Ho Hung Kwong, Department of Medicine, Pamela Youde Nethersole Eastern Hospital (December 2017 Gastroenterology & Hepatology Exit Assessment Exercise)

Introduction There is a growing number of aging population in Hong Kong, and a significant proportion of endoscopic retrograde cholangiopancreatography (ERCP) procedures was performed in extreme elderly patients aged 90 or above (nonagenarian). Local data on clinical outcomes of ERCP performed in nonagenarian patients is lacking.

Objective To examine the safety and efficacy of ERCP in nonagenarian compared with those younger than 90 years old.

Methods A retrospective analysis of ERCP procedures performed in a regional hospital in a three-year period from 2014 to 2016 was conducted. The differences between nonagenarian and younger patients were compared with respect to the ERCP-related complication rate and mortality as well as the success rate of CBD cannulation and biliary decompression.

Results A total of 212 patients with 475 ERCP procedures were recruited into this study. Patients were divided into nonagenarian (group A) and those under 90 years of age (group B). In group A, 104 patients with a mean age of 92.3 years (range, 90-99 years) underwent 227 (47.8%) ERCP procedures. In group B, 108 patients with a mean age of 71.3 years (range, 34-89 years) underwent 248 (52.2%) ERCP procedures. Group A patients were significantly

older than group B patients ($P < 0.001$) and had a higher number of chronic concomitant diseases (3.63 vs 2.20, $P < 0.001$). Among the 186 patients without prior sphincterotomy undergoing initial ERCP, the success rate of CBD cannulation was comparable between the two groups (84.9% vs 93.0%, $P = 0.075$). Biliary decompression was achieved in 79.8% of group A and 88% of group B patients ($P = 0.106$). The overall ERCP-related complication rate was 6.9% with no significant difference between the two groups (5.7% vs 8.1%, $P = 0.317$). Post-sphincterotomy bleeding was the most common complication in both groups (3.1% vs 4.4% $P = 0.441$). No visceral perforation or 30-day ERCP-related mortality was observed.

Conclusion ERCP-related complications and mortality in nonagenarians were comparable to younger patients despite a higher prevalence of chronic concomitant diseases. ERCP was an efficacious therapeutic procedure in nonagenarians with a high success rate of CBD cannulation and biliary decompression. Overall, ERCP is safe and efficacious in the management of biliary tract diseases in nonagenarian patients.

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A RETROSPECTIVE STUDY OF THE EPIDEMIOLOGY, CLINICAL CHARACTERISTICS, TREATMENT AND OUTCOMES OF *CLOSTRIDIUM DIFFICILE* INFECTION IN A REGIONAL HOSPITAL OF HONG KONG

Dr Tam Tin Chak Aston, Department of Medicine, Pamela Youde Nethersole Eastern Hospital (December 2017 Gastroenterology & Hepatology Exit Assessment Exercise)

Background *Clostridium difficile* is one of the most common healthcare-associated pathogens worldwide. The epidemiology of *Clostridium difficile* infection (CDI) in North America and Europe is well documented. However, few local studies have examined the epidemiology of CDI in hospitalized patients in Hong Kong.

Objective The primary objective was to study the epidemiology, clinical characteristics, treatment and outcomes of CDI in a regional hospital in Hong Kong. The secondary objective was to examine the risk factors associated with severe and recurrent CDI.

Methods A retrospective study of all hospitalized patients greater than 18 years of age diagnosed with CDI at the Pamela Youde Nethersole Eastern Hospital (PYNEH) from January 2015 to December 2016.

Results A total 287 CDI cases were identified. The CDI incidence rates increased by 56.1% per 10,000 admissions and 48.1% per 10,000 patient-days during the 2-year study period. The mean age was 74.5 years with 74.2% aged 65 or above. The male to female ratio was 1.09:1. The median duration of diarrhea was 6 days. Fever was present in 45.6% of the cases. Oral metronidazole monotherapy (76.7%) was the most common initial treatment. The disease was classified as mild or moderate in 168 (61.1%) cases and severe in 107 (38.9%) cases. Multiple logistic regression analysis showed that prior use of penicillins (OR=3.26, $p=0.004$) and carbapenems (OR=1.81, $p=0.033$) were significant risk factors for severe CDI. Twenty of 210 CDI cases developed recurrence. Multiple logistic regression analysis showed that younger age (<65) (OR=2.86, $p=0.031$) and prior use of metronidazole (OR=2.90, $p=0.034$) were significant risk factors for recurrence.

Conclusion There was an increase in incidence rate of CDI during the study period. Prior exposure to penicillins and carbapenems were risk factors for severe disease while younger age and prior use of metronidazole were predictors of recurrence.

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A RETROSPECTIVE STUDY OF RECTAL DICLOFENAC IN PREVENTING POST ENDOSCOPIC RETROGRADE CHOLANGIOPANCREATOGRAPHY PANCREATITIS

Dr Wong Yiu Kwong, Department of Medicine, North District Hospital (December 2017 Gastroenterology & Hepatology Exit Assessment Exercise)

Background Post ERCP pancreatitis is the most common and serious complication after ERCP. Rectal NSAID has been proven to prevent development of post ERCP pancreatitis. However, it is still uncertain if 50mg rectal Diclofenac is useful in preventing patients from post ERCP pancreatitis.

Objective It is a retrospective study to evaluate the effect of 50mg rectal Diclofenac on the incidence and severity of post ERCP pancreatitis. It also assesses whether there are any difference in the adverse outcomes after 50mg rectal Diclofenac, and the risk factors associated with the incidence and severity of post ERCP pancreatitis.

Methods ERCP episodes meeting the inclusion criteria with rectal Diclofenac given between January and June 2014 in NDH were compared to the historical control without rectal Diclofenac given between January and June 2012 in NDH. The primary outcomes were comparing the incidence and severity of post ERCP pancreatitis between two groups. The secondary outcomes included the adverse events after giving rectal Diclofenac, and the correlation of risk factors with incidence and severity of post ERCP pancreatitis.

Results Fewer patients in NSAID group developed post ERCP pancreatitis (4.4% vs 10.6%, $p = 0.01$) and moderate or severe post ERCP pancreatitis (3.2% vs 8.8%, $p = 0.01$). Total 14 patients (2.63%) had adverse outcomes after ERCP without statistically significant difference between two groups. Procedure-related risk factors were found to be positively associated with post ERCP pancreatitis.

Conclusion 50mg rectal Diclofenac showed reduction of incidence of post ERCP pancreatitis without increasing in adverse outcomes. Several risk factors played the role of incidence of post ERCP pancreatitis.

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THE CONCEPT OF FRAILTY

Dr Cheng Man Fung, Department of Medicine, Tseung Kwan O Hospital (December 2017 Geriatric Medicine Exit Assessment Exercise)

Introduction Population ageing is accelerating worldwide. According to the World Health Organization, the global population of elderly people aged 60 years or more was 600 million in 2000. It is expected that 2 billion people will be aged over 65 by 2050.¹ The absolute and relative increases of older people occurs from the richest to the poorest regions of the world.² Population ageing has profound impact on social and health aspects, which is characterized by a growing demand for health care services from clinically complex elders, a population for which the application of standard decisional algorithms and evidence is frequently challenging.³

The concept of frailty The number of scientific publications on frailty has been increasing exponentially during the past 15 years (Fig. 1).² The concept of frailty has appeared in the literature of geriatric medicine since 1950s.^{4,5} A more consistent and frequent use of the term frailty started, however, after the publication of its formal operational definitions. The birth of frailty is dated to 2001, when the phenotype was proposed by Fried and colleagues.^{6,2} Frailty is a state of increased vulnerability to poor restoration of homeostasis after a stressor event and increases the risk of adverse outcomes, including falls, delirium, and disability.^{7,8} It also means that the same stressor may cause different consequences when it inflicts on a frail individual, compared with a robust person.⁷ Frailty is the consequence of age-related accumulative defects in different physiological systems.⁹ The 2004 American Geriatrics

Society/National Institute on Aging conference on frailty in older adults described frailty as “a state of increased vulnerability to stressors due to age-related declines in physiologic reserve across neuromuscular, metabolic and immune systems”.¹⁰ It has also been recognized as a pre-disability condition which is potentially reversible.¹¹⁻¹³

Frailty remains an evolving concept.^{14,15} The concept of frailty has been acknowledged as multi-dimensional.¹⁶

Frailty, ageing, co-morbidities, disability and resilience There are differences between frailty, ageing, co-morbidities, disability, and resilience. Ageing can be defined as the decline and deterioration of functional properties at the cellular, tissue and organ level. However, old age does not define frailty. The definition of frailty has commonality to that of ageing. Both have a basis of decline in function and disturbance of homeostasis. But the observed changes in both functional performance and biomarker distribution are distinct from the corresponding age-related changes observed in the non-frail individuals.¹⁷

Frailty is strongly correlated with chronological age, but it is not an inevitable part of ageing.^{18,19} It has been observed that the prevalence of frailty within closely aligned age strata, even in the very old persons, is variable.²⁰

It is also important to note that each frail elderly experiences unique symptoms and consequences and that frailty is not related to specific diseases, but is rather a combination of consequences of co-morbidities.⁶ Therefore, frailty does not specify a particular co-morbidity or a sum of co-morbidities. The relationship between frailty and disability is controversial. Some clinicians avoid using a strict arbitrary categorization and do not exclude the possibility that a disabled individual can be defined as frail.^{19,21} Another body of literature prefers framing frailty as a pre-disability condition.^{22,23} Frailty, according to this definition, becomes a target condition for preventive interventions against disability.

Resilience is a concept being used more frequently in recent few years. It is described as “the human ability to adapt in the face of tragedy, trauma, adversity, hardship, and on-going significant life stressors.”²⁴ Resilience explains why two apparently similarly frail persons may react differently to a stressor. The one able to better cope with the stressor is considered to be more resilient. The subject may have richer external resources for counteracting the negative forces challenging his homeostasis, for example, a more robust social network and higher economic status.

In 2015, the World Report on Ageing and Health published by the World Health Organization has introduced the concepts of intrinsic capacity (i.e., the composite of all the physical and mental capacities of an individual) and functional ability (i.e., the health-related attributes that enable people to be and to do what they have reason to value), both presenting solid foundations in the geriatric background of frailty.²⁵

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EFFICACY AND SAFETY PROFILE OF DIPEPTIDYL PEPTIDASE-4 INHIBITORS IN ELDERLY WITH TYPE 2 DIABETES MELLITUS IN A REGIONAL HOSPITAL IN HONG KONG

Dr Ho Ka Shing, Department of Medicine & Geriatrics, Tuen Mun Hospital (December 2017 Geriatric Medicine Exit Assessment Exercise)

Background Dipeptidyl peptidase-4 (DPP-4) inhibitors has become more widely used in elderly patients with type 2 diabetes mellitus. Previous studies, which mainly focused on young and relatively healthy adults, showed a modest reduction of glycated haemoglobin (HbA1c) with a good safety profile. However, there is scanty evidence on the clinical efficacy and safety profile of DPP-4 inhibitors in older Chinese patients.

Objectives To evaluate the efficacy, clinical characteristics of good responders and safety

profile of DPP-4 inhibitors in Chinese elderly with type 2 diabetes.

Methods A retrospective observational study was conducted in a regional hospital in Hong Kong. Patients with type 2 diabetes aged 65 or above, who were newly prescribed DPP-4 inhibitors in 2015, were included. Clinical data including demography, drug regimen, number of admissions and blood results were collected and analyzed. Primary outcome was HbA1c change at 6 months. Secondary outcomes were predictors of good response to DPP-4 inhibitors and safety profile in 1 year.

Results 197 patients were included in this study. The mean age was 75 and mean baseline HbA1c was 8.7%. The mean change of HbA1c was $-0.76\% \pm 1.3\%$ at 6 months after DPP-4 inhibitors was started. Higher baseline HbA1c level was found to be the only independent predictor for good response to DPP-4 inhibitors at 6 months (odds ratio 2.42, 95% confidence interval 1.72-3.42, p -value 0.0001). The number of admission due to hyperglycemia or hypoglycemia was reduced after DPP-4 inhibitors started. The discontinuation rate due to adverse effect was low.

Conclusion DPP-4 inhibitors showed good efficacy and safety profile in Chinese diabetic elderly patients. More researches focusing on tolerability and benefits for frail diabetic elderly are needed.

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A PROSPECTIVE STUDY ON THE OUTCOME OF ACUTE INFLUENZA ILLNESS IN HOSPITALISED ELDERLY WITH OR WITHOUT INFLUENZA VACCINATIONS AS LATEST RECOMMENDED

Dr To Cho Ting, Department of Medicine, Yan Chai Hospital (December 2017 Geriatric Medicine Exit Assessment Exercise)

Background Seasonal influenza is associated with substantial mortality and morbidity in elderly patients. They are more vulnerable and associated with more serious complications that might result in longer hospital stays and deaths. Hospitalised elders who received seasonal influenza vaccinations might have survival advantages in terms of less complications, shorter hospital stays and lower death rates.

Objectives To compare the mortality of hospitalized elderly influenza patients who had or had not received the latest recommended seasonal influenza vaccinations. Factors associated with increased mortality other than vaccination status, if any, are analysed.

Methods Starting from November 2015 through June 2016, patients admitted to Yan Chai Hospital aged 60 or more with a confirmed diagnosis of acute influenza by laboratory tests were recruited and analysed prospectively. Their background demographic characteristics, premorbid functional status, comorbidities and influenza vaccination status were collected using a standard data collection sheet by the investigator. The primary outcome parameter is death during the index admission. The secondary outcome parameters measured are the length of stay, presence of pneumonia and other complications and change in functional status.

Results Seventy-one elderly hospitalized patients who have confirmed influenza A or influenza B were analysed. Of them, 55 (77.5%) were community dwelling. Community dwelling elderly patients were significantly less likely to have received seasonal influenza vaccinations (74.5%, $p < 0.001$) whereas, 14 out of 16 institutionalised elders (87.5%, $p < 0.001$) were vaccinated. Patients in the vaccinated group had higher prevalence of chronic heart disease (39.3% vs 16.3%, $p = 0.04$) and diabetes mellitus (50% vs 25.6%, $p = 0.04$). One vaccinated and two unvaccinated community dwelling elders died (3.6% vs 4.7%, $p = 1.0$), the difference was not significant. Older age of patients was associated with higher mortality which was significant ($P = 0.016$). The median days of hospital stay in the vaccinated and unvaccinated group were 6 and 4 days, respectively ($P = 0.03$). No statistical significant difference in pneumonia or other complications was found between vaccinated and unvaccinated group. Older age was significantly associated with change in Modified

Functional Ambulatory Category (MFAC) of at least one category after discharge (P= 0.013).

Conclusion In this small prospective cohort study in elderly influenza patients admitted to hospital, older age predicted higher mortality and functional decline regardless of vaccination status. Those who had received seasonal flu vaccinations had more prevalent comorbidities and were more likely institutionalised, and might have explained longer hospital stays.

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FACTORS ASSOCIATED WITH MORTALITY IN NURSING HOME-ACQUIRED PNEUMONIA

Dr Wong Cheuk Lun, Department of Medicine, Queen Elizabeth Hospital (December 2017 Geriatric Medicine Exit Assessment Exercise)

Objectives This study aim to identify the factors affecting mortality in elderly patients hospitalised for nursing home-acquired pneumonia, and to examine the infective aetiological agents, the pattern as well as the appropriateness of empirical antibiotics in this group of patients.

Methods This was a single centre retrospective study conducted in a regional hospital. Demographic data, Charlson comorbidity index (CCI), clinical parameters, laboratory, microbiological and radiographic findings, treatment and clinical outcomes of patient hospitalized for nursing home-acquired pneumonia within the period of 1/12/2014 to 31/12/2014 were analyzed.

Results A total of 104 patients eligible patient were identified according to the infection surveillance definitions for long-term care facilities (i.e. the McGeer Criteria). In-hospital mortality rate, 30-day mortality rate and 1-year mortality rate were 25%, 27.9% and 64.4% respectively. Serum albumin level was the only investigated factor that showed a statistical significant difference on 30-days mortality, being 33 (30 – 37) and 30 (27 – 34) in 30-days survivor and non-survivors respectively (p = 0.007). 27 patients (26.0%) had an identifiable bacterial cause, 7 patients had an identifiable viral cause and 1 patient had tuberculosis. *Pseudomonas aeruginosa* was the most frequent identified infective aetiology and there were 4 cases of multi-drug resistant bacteria. Majority of patient (87.5%) received empirical treatment concordant to BTS or IDSA 2003 guideline for community acquired pneumonia and 13 patients (12.5%) received empirical treatment concordant to ATS/IDSA 2005 guideline for healthcare-associated pneumonia. Only 33.3% of patients with identifiable bacterial causes received initial antibiotics therapy that bacteria isolated were susceptible in vitro according to sensitivity testing.

Conclusions This study identified serum albumin level as a factor associated with 30-days mortality in nursing home-acquired pneumonia. The choice of empirical antibiotics did not have a significant influence on 30-days mortality regardless of the susceptibility of bacteria isolated.

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TO INVESTIGATE THE PREVALENCE OF FRAILTY IN ELDERLY LIVING IN PRIVATE RESIDENTIAL CARE HOMES IN A REGIONAL DISTRICT AND TO STUDY THE RELATIONSHIP OF FRAILTY TO VARIOUS CLINICAL OUTCOMES

Dr Woo Wai Shan Sandy, Integrated Medical Service, Ruttonjee Hospital (December 2017 Geriatric Medicine Exit Assessment Exercise)

Background The prevalence of frailty in local residential care homes for the elderly (RCHEs) has not been extensively reported. Frailty is a geriatric syndrome which impacts on mortality and hospitalisation. In addition, it is linked to care needs. This study aims to characterise the heterogeneous elderly in RCHE using the frailty spectrum to describe their care needs and enable planning for community services. RCHE residents will have a declining

trajectory culminating in palliative needs who may be better supported in the community through advanced care planning (ACP) and career support.

Objective To study the prevalence of frailty of elderly living in residential care homes (RCHE) and the relationship of frailty to hospital admission, mortality, co-morbidities and polypharmacy over a period of 6 months.

Subject and method Elderly aged 65 or above living in private RCHEs receiving the services of Community Geriatric Assessment Team (CGAT), Hong Kong East Cluster (HKEC) was recruited and their degree of frailty using the Clinical Frailty Scale (CFS) and Frail-Nursing Home Scale (FRAIL-NH) assessed. Baseline characteristics of residents were described using age, gender, Charlson Co-morbidity Index (CCI), numbers of medications and presence of cognitive impairment. Outcomes such as mortality and service utilization at Accident and Emergency Department (AED), unplanned hospital admissions and enrolment to ACP over a period of 6 months from April 2017 to September 2017 were documented prospectively. The relationship of frailty to these outcomes will be described.

Results 262 elderly aged 65 or above living in RCHE were recruited. 48.2% and 68.3 % elderly were frail using FRAIL-NH and CFS assessment tool respectively. Approximately 10% fall into pre-frail state using both tools. Most elderly score 7 in CFS (40.8%) and score 9 in FRAIL-NH (27.9%). Advanced age, female sex and cognitive impairment were all associated with frailty. Using CFS, frailty was significantly associated with unplanned hospital admissions ($p=0.004$) and using FRAIL-NH tool, frailty was significantly associated with AED attendance ($p=0.013$) and unplanned hospital admissions ($P=0.001$).

Conclusion More than half of elderly in RCHEs are frail using CFS and nearly half using FRAIL-NH tool. Nearly one third had advanced frailty. Being frail was associated with increased hospital utilisation when compared with non-frail using both CFS and FRAIL-NH assessment tools. This study demonstrated the feasibility of CFS and FRAIL-NH used by nurses in long term care settings to characterise the heterogeneous elderly for better service planning, patient care planning and team communication. In our study population, service gaps existed for those with end stage frailty with sub-optimally low enrolment to advance care planning and end of life care.

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A RETROSPECTIVE REVIEW ON THE OUTCOME, COMPLICATIONS AND SURVIVAL OF PATIENTS WITH LOW GRADE B CELL LYMPHOPROLIFERATIVE DISEASE ON CHEMOTHERAPY TREATMENT, A REGIONAL HOSPITAL'S EXPERIENCE

Dr Yeung Ka Pik Vivian, Department of Medicine & Geriatrics, Tuen Mun Hospital (November 2017 Haematology & Haematological Oncology Exit Assessment Exercise)

Introduction Indolent B cell lymphoproliferative disease (B-LPD) is a vastly heterogeneous group of disease with few requiring management no more than monitoring and observation (1). Those who do require treatment are very variable in terms of treatment response and outcome, and typically go into a relapsing and remitting clinical course which requires patients to be managed over a lifetime (2). While the indolent nature of the disease and its responsiveness to treatment allows extended survival, the disease remains incurable. Many patients are old and frail, with multiple comorbidities rendering them susceptible to treatment toxicity. Morbidity and mortality resulting from treatment remains a constant threat to survival.

The past decade witnessed remarkable advancement in the treatment in this disease category, especially chronic lymphocytic leukaemia/small lymphocytic lymphoma (CLL/SLL), moving from alkylating agents, chemoimmunotherapy to novel targeted agents with less toxicity and higher efficacy in disease control. We are also moving into the era of personalized medicine, and to tailor treatment according to cytogenetic and molecular information will soon become

the standard of care.

However, due to limitation in resources and drug accessibility, only a handful of patients can benefit from this advancement timely. Treatment regimens that are extensively studied and well used remain the few that are funded by the government and available to the majority of patients in the public sector. Hence, it is essential that we constantly review our current practice and look for room for improvement.

This dissertation comprises of review on current literature on the treatment of different indolent B-LPD, followed by retrospective review on the treatment regimens and its toxicity, response and survival outcome of patients with indolent B-LPD who received care from the Haematology Unit of Tuen Mun Hospital from 1999 to 2016. As low grade B cell lymphoma is generally an indolent disease with its course characterised by treatment response and disease relapse, efficacy of treatment has to be balanced against treatment toxicity, and undue treatment toxicity has to be avoided. Hence, treatment toxicity arising from chemotherapy were particularly studied and compared with published data.

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THE EFFECT OF NOCTURNAL HOME HEMODIALYSIS ON LEFT VENTRICULAR HYPERTROPHY IN END STAGE RENAL DISEASE PATIENTS – A SIX YEARS STUDY

Dr Cheng Hiu Man, Department of Medicine & Geriatrics, Princess Margaret Hospital (December 2017 Nephrology Exit Assessment Exercise)

Background Left ventricular hypertrophy (LVH) is known to cause significant morbidity and mortality in end stage renal disease (ESRD) patients receiving dialysis. Evidences on the effect of nocturnal home hemodialysis (NHHD) on LVH are conflicting.

Objectives This study aims to determine the 2-year effect of NHHD on left ventricular mass index (LVMI) in ESRD patients and the correlation between changes in LVMI and its risk factors. The effect on LVMI up to 6 years was also investigated.

Methods This was a retrospective longitudinal study on ESRD patients receiving NHHD from 2006-2015 in Princess Margaret Hospital. Yearly LVMI and other clinical data were collected.

Results A total of 41 patients were recruited. LVMI was significantly reduced by 19.53g/m²(95%CI,-35.6 to -3.45g/m²; p=0.019, n=41) after two years. Of these 41 patients, 27(66%) had reduction in LVMI by 43.76g/m²(p<0.001). These patients also had significant reduction in left ventricular end diastolic volume (LVEDV), LV end-diastolic diameter (LVDd) and LV end-systolic diameter (LVDs). The remaining 14 patients had no reduction in LVMI. Changes in LVEDV, LV end-systolic volume (LVESV), LVDd, LVDs were significantly correlated with LVMI change. Systolic blood pressure (SBP), number of anti-hypertensive drugs and hemoglobin level were risk factors that significantly correlated with LVMI change. LVMI reduced significantly in the LVH group over 6 years, whereas no significant change was observed in the non-LVH group.

Conclusion LVH regressed significantly after two years of NHHD. LVEDV, LVDd, LVDs were reduced significantly in 66% of patients. Significant improvement of LVMI was observed in those patients with LVH over 6 years.

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TIME-AVERAGED HYPOKALAEMIA AND ITS ASSOCIATIONS IN INCIDENT ELDERLY RENAL FAILURE PATIENTS UNDERGOING CONTINUOUS AMBULATORY PERITONEAL DIALYSIS (CAPD)

Dr Lee Hiu Yu, Department of Medicine & Geriatrics, Tuen Mun Hospital (December 2017

Nephrology Exit Assessment Exercise)

Background CAPD patients with hypokalemia have been shown to be associated with increase mortality and decrease in survival, and elderly patients on CAPD may be more prone to develop hypokalemia with significant consequences. The aim of the study is to assess the prevalence of hypokalemia in elderly CAPD patients and analysis their outcome.

Methods This was a retrospective study. All incident CAPD patients followed up in Tuen Mun hospital age 65 or above within the period from 1st Jan., 2010 to 31st Dec., 2015 inclusively were recruited. Time averaged mean plasma potassium level was used for analysis, and level below 3.4mmol/L was defined as hypokalemia. Disease pathology, medications, infections, cardiovascular complications and outcome were recorded for investigation.

Result Total 222 elderly CAPD patients were recruited within the period. The mean age was 70.9 +/- 4.4 years old and the subjects were divided into 3 groups according to their potassium level. There were 29 patients (13%) with mean plasma potassium <3.4mmol/L, 185 patients (83%) with mean plasma potassium >=3.5 to <4.5mmol/L and 8 patients (3%) with mean plasma potassium >=4.5mmol/L. There were 162 patients (73%) receiving regular potassium supplement. Hypokalemia was found to be associated with an increased infective episode rate, 0.21, 0.14 and 0.11 per month of the 3 groups respectively (P = 0.001), increased peritonitis mortality to 46% (P = 0.01) and decreased survival (log rank test, P= 0.005)

Conclusion The prevalence of hypokalemia in this cohort of elderly CAPD patients was 13%, and hypokalemia was significantly associated with increased infective complications and peritonitis mortality. Targeted potassium replacement is therefore suggested.

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PREDICTING CLINICAL OUTCOME IN PERITONEAL DIALYSIS PATIENTS USING KT WITH DIFFERENT NORMALIZATION APPROACHES: A SINGLE-CENTRE STUDY

Dr Wan Ching Kit, Department of Medicine, Alice Ho Miu Ling Nethersole Hospital (December 2017 Nephrology Exit Assessment Exercise)

Background Urea Kt/V, urea clearance x dialysis time product (Kt) normalized to the urea distribution volume (V), is the recommended index to quantify dialysis dose. The choice of total body water as a normalizing factor may lead to possible erroneous results due to theoretical and practical reasons. Therefore, non-normalized index Kt, or normalizing Kt to other body size estimates, such as body surface area and ideal body weight, are possible dialysis adequacy indices of interest that may strengthen its association with clinical outcome.

Methods This was a retrospective study comparing survival amongst incident peritoneal dialysis (PD) patients who commenced PD from 2005 to 2010 at the Alice Ho Miu Ling Nethersole hospital. Survival and factors associated with mortality were studied. Kt/V as a clearance target was modified and compared to different indices: non-normalized Kt, Kt normalized to body surface area (Kt/BSA), and Kt/V based on ideal body weight (Kt/Videal). Cox-proportional hazard models were used to examine their association with patients' mortality, with adjustment of various confounders.

Results A total of 223 incident PD patients (mean age 60.5, 60.1 % male, 56.5 % diabetes mellitus) who had baseline Kt/V measurement after starting PD were included. The mean follow up was 3.66 ± 1.40 years. The 1-, 3- and 5-year survival rates were 90.6%, 65.5% and 51.6%, respectively. Significant mortality risk factors for the 5-year survival were older age, diabetes mellitus, history of cardiovascular disease, high Charlson Comorbidity index, low residual glomerular filtration rate, high body mass index, low normalized protein nitrogen appearance, low weekly total Kt/V, low weekly total Kt/Videal, low weekly total Kt and low weekly Kt/BSA. In the multivariate analysis, older age, history of cardiovascular disease, low weekly total Kt/V, low weekly total Kt/Videal, low weekly total Kt and low weekly Kt/BSA

remained as independent predictors of mortality. Our data also showed significant decrease in adjusted hazard ratios with increasing weekly total Kt/V, weekly total Kt/Videal and weekly total Kt/BSA but not weekly total Kt. Moreover, a better dialysis dose-mortality relationship with progressive reduction in mortality risk was demonstrated when the dialysis dose was quantified using weekly total Kt/Videal and weekly total Kt/BSA.

Conclusion Our findings suggest Kt and Kt normalized to V, Videal and BSA are independent predictors of mortality. Kt/Videal and Kt/BSA may be better indices in term of dose-mortality relationship. Further prospective studies are necessary to explore the relationship between dialysis dose with normalization to different metrics strategies and mortality, and optimize the clearance targets especially at extreme body habitus. Kt/V with correction to ideal body weight and normalization to body surface area may be considered as potential options to target based on our study results.

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FACTORS PREDICTING FAVOURABLE OUTCOME FOR DECOMPRESSIVE HEMICRANIECTOMY IN MALIGNANT MIDDLE CEREBRAL ARTERY INFARCTION

Dr Kwan Hon Hang, Department of Medicine & Geriatrics, Princess Margaret Hospital (November 2017 Neurology Exit Assessment Exercise)

Background Malignant middle cerebral artery (MCA) infarction was associated with an 80% mortality rate. Decompressive hemicraniectomy has been suggested to decrease mortality and improve functional outcome. Nevertheless, it is still unclear which groups of patients benefit most from this surgery. Quality of life remains another key factor during the decision making.

Aims To determine possible factors associated with survival rate and favourable outcome in patients with malignant MCA infarction after receiving decompressive hemicraniectomy.

Methods Between August 2009 and August 2017, 32 patients with malignant MCA infarction underwent decompressive hemicraniectomy in a regional hospital in Hong Kong. The outcome measure was mortality and the modified Rankin scale (mRS).

Results A total of 32 patients with a mean age of 58.6 were recruited. The mortality rate was 38.7% at day 90 and day 180. 64.5% and 58.1% of patients had an unfavourable outcome defined as mRS > 4 at day 90 and day 180 respectively. Involvement of more than one vascular territories was associated with an unfavourable functional outcome at day 90 (p=0.028) and day 180 (p=0.010). Signs of herniation were also associated with a poorer functional outcome at day 180 (p=0.036). Neither age, timing of surgery nor laterality of stroke was shown to correlate with neurological outcome.

Conclusion More than one-third of patients with malignant MCA infarction died after receiving decompressive hemicraniectomy. Less than half the patients survived with a favourable outcome. Involvement of a single vascular territory and the absence of signs of herniation were associated with favourable outcome.

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CLINICAL PREDICTORS FOR SUCCESSFUL REMOVAL OF NASOGASTRIC TUBE-FEEDING IN POST-STROKE DYSPHAGIC PATIENTS

Dr Yam Chin Pang, Department of Medicine, Tung Wah Eastern Hospital (Decemebr 2017 Rehabilitation Exit Assessment Exercise)

Background Dysphagia is common after stroke. Severe post-stroke dysphagic patients often require tube feeding. Tube feeding is a common reason of caring problem. The aim of this study is to look for any predictive factors for successful removal of nasogastric tube

feeding for hospitalized stroke patients to improve stroke rehabilitation program and discharge planning.

Methods This is a retrospective cohort study conducted on post-stroke dysphagic patients required nasogastric tube feeding admitted to the Acute Stroke Unit (ASU) of Pamela Youde Nethersole Eastern Hospital (PYNEH) and then transferred to the Stroke Rehabilitation Unit (STR) of Tung Wah Eastern Hospital (TWEH). They were classified into two groups depending on their feeding status upon discharge from TWEH. Factors examined include their demographic data, past medical histories, length of stay at acute hospital, characteristics of their stroke, nutritional status, speech therapist (ST) assessment results, swallowing treatment modalities received, their functional scores of National Institute of Health Stroke Scale (NIHSS), Barthel Index (BI), modified Rankin Scale (mRS) and Functional Independence Measure (FIM), swallowing scores of Royal Brisbane Hospital Outcome Measure of Swallowing (RBHOMS) and Penetration Aspiration Scale (PAS) scores, and Glasgow Coma Scale (GCS).

Results There were 98 patients included in this study. Majority of patients were geriatric patients (≥ 65 years old). By univariate analysis, statistically significant factors for successful removal of nasogastric tube feeding before hospital discharge include a negative history of old stroke, higher body mass index (BMI), less severe dysphagia grading by ST on first assessment, improvement in NIHSS and GCS respectively, a higher discharge GCS score at acute hospital, participation in swallowing exercise training and Chinese acupuncture; ischemic stroke patients who received intravenous recombinant tissue plasminogen activator (IV r-tPA) treatment; those who passed the first Video-fluoroscopic Swallowing Study (VFSS) with lower PAS scores. Multivariate analysis identified severe grade of dysphagia by ST as a negative predictor; participation in swallowing exercise training and Chinese acupuncture as positive predictors. Swallowing exercise training and Chinese acupuncture were associated with successful weaning of nasogastric tube feeding in post-stroke dysphagic patients before hospital discharge.

Conclusions Severe grade of dysphagia by ST was a negative predictor; while participation in swallowing exercise training and Chinese acupuncture were positive predictors for successful weaning of nasogastric tube feeding in post-stroke dysphagic patients before hospital discharge. Further studies are required for evaluation of each kind of swallowing exercise and components of Chinese acupuncture.

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CLINICAL CHARACTERISTICS, MANAGEMENT AND OUTCOMES OF PATIENTS ADMITTED FOR ACUTE EXACERBATION OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE

Dr Tang Sze Wan, Department of Medicine, Tseung Kwan O Hospital (December 2017 Respiratory Medicine Exit Assessment Exercise)

Background Chronic obstructive pulmonary disease (COPD) is a prevalent disease locally. Acute exacerbation can be life-threatening. Patients may present with great respiratory distress or even in respiratory failure. Ventilatory support may need to be initiated. Study investigating the associated factors for use of ventilatory support facilitates early identification of this group of patients.

Method A retrospective study was performed in July 2015 to June 2016 to study the clinical characteristics, management and outcomes of patients admitted for acute exacerbation of COPD (AECOPD). Patients were recruited through Clinical Data Analysis and Reporting System (CDARS). The associated factors for use of ventilatory support were identified.

Results 133 patients were recruited. 5 patients (all required ventilatory support) succumbed in the index admission. The mean age was 75.5 ± 9.5 years. 91% of patients suffered from moderate to very severe disease. 8.3% had undiagnosed COPD and 36.4% of this subgroup

required ventilatory support. 66.2% were put on long-acting bronchodilators and 22.6% were on inhaled corticosteroid monotherapy. 23.3% received non-invasive ventilation and 4.5% received invasive mechanical ventilation. Arterial blood gas pH < 7.35 (OR 46.22, $P=0.001$) and PaCO₂ (OR 3.01, $P=0.001$) were found to be the associated factors for use of ventilatory support. Ventilatory support in the index admission (OR 14.31, $P=0.009$) was associated with hospitalization for more than 6 days and presence of hypotension was strongly associated with mortality (OR 114.39, $P=0.001$).

Conclusion A high proportion of patients admitted for AECOPD presented with need for ventilatory support on admission. Acidaemia and hypercapnia were found to be the associated factors for use of ventilatory support.

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SPIROMETRIC DATA OF THE ELDERLY CHINESE AND ITS RELATIONSHIP TO THE CURRENT REFERENCE EQUATIONS

Dr Yip Wing Ho, Department of Medicine & Therapeutics, Prince of Wales Hospital (December 2017 Respiratory Medicine Exit Assessment Exercise)

Background Pulmonary function test is a crucial investigation for diagnosing respiratory diseases, assessing disease severity, guiding prognosis and monitoring patient's progress. Hong Kong has an aging population. Previous population lung function reference study in Hong Kong consisted of a very small number (70 subjects, less than 7%) of the elderly subjects with the age from 70 to 80 years old. It is uncertain whether the reference values calculated by extrapolation of the younger subjects are suitable for estimating the lung function of the elderly subjects.

Objective This study aimed to assess the spirometric values of healthy elderly Chinese with smoking history <10 pack years and its relationship to the reference data in Hong Kong and Global lung function 2012 equations.

Study designs A cross-sectional study to measure spirometric parameters including forced expiratory flow rate in 1 second [FEV₁], forced vital capacity [FVC] and the FEV₁/FVC ratio [FEV₁/FVC] in the elderly Chinese aged ≥ 70 years old in comparisons with the current reference equations.

Results Altogether 139 subjects were recruited in the study. Current reference equations significantly overestimated the FEV₁ and FVC of male and FVC of female but under-estimated the FEV₁/FVC ratio. The fixed cut off of FEV₁/FVC ratio <0.7 over-estimated airflow limitation in this population by 5.75 to 8.63%.

Conclusions Current reference equations over-estimated the spirometric results of the Chinese elderly aged ≥ 70 years old in Hong Kong. Further study is needed for working out the reference values for this group of patients.

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AN ANALYSIS ON THE INFECTIOUS DISEASE BURDEN FROM IMMUNOSUPPRESSIVE THERAPY IN ANTINEUTROPHIL CYTOPLASMIC ANTIBODY-ASSOCIATED VASCULITIS

Dr Tse Yin Fung, Department of Medicine, Yan Chai Hospital (December 2017 Rheumatology Exit Assessment Exercise)

Study Background Antineutrophil cytoplasmic antibody (ANCA)-associated vasculitis (AAV) is one of the potentially life-threatening disorders in the field of rheumatology. Disease control by immunosuppressive therapy is frequently associated with increased infections; infectious complications are the leading cause of death in the first year after diagnosis of AAV. This study is to identify the clinical characteristics, risks and types of infections in AAV.

Design, setting, participants and measurements This study retrospectively assessed 69 patients diagnosed from January 1, 2006 to December 31, 2015 in three hospitals in Hong Kong, China and treated with immunosuppressive therapy. Patients with end stage renal failure (ESRF) at initial presentation or follow up less than 6 months were excluded. T-test and Fisher's exact test were used for between-group analysis. Time to infection was evaluated by the Kaplan–Meier method. Risk factors for infection were evaluated by logistic regression models.

Results Of the 69 patients, 64% of them experienced at least one infection within 1 year of starting immunosuppressive therapy. Infections affecting the respiratory system were the most common, followed by genitorurinary tract and gastrointestinal tract/hepatobiliary tract infections. The median time to first infection was 117 days. In the logistic regression model for the occurrence of infections, the odds of infection were 0.27 times lower for females compared to males if all other variables were held constant. For every one year increase in the patient's age, the odds of severe infection increased by 6%.

Conclusions The infection burden from immunosuppressive therapy in treating AAV remains high. Respiratory tract infections are the most common. Male sex and older age increase risk of infection.

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Note: For obtaining the full dissertation, please contact the author directly.