台灣腎臟醫學會
秋季會暨北部地方會

【第 253 次腎臟學學術討論會】

節目表及摘要

- 第 253 次腎臟學學術討論會
  時　間：113 年 9 月 22 日(星期日) 09:00 – 12:20
  地　點：台北榮民總醫院致德樓第二會議室及第三會議室

- 第 108 次透析人員在職繼續教育訓練課程
  時　間：113 年 9 月 22 日(星期日) 09:00 – 11:50
  【北部場次】
  地　點：台北榮民總醫院介壽堂
  【中部場次】
  地　點：台中榮民總醫院研究大樓 2F 第一會場
  【南部場次】
  地　點：高雄醫學大學附設醫院啟川大樓 6 樓第一講堂

台 灣 腎 臟 醫 學 會
北 部 地 方 會

時 間：113 年 9 月 22 日(星期日)上午 9:00 – 12:30

地 點：台北榮民總醫院致德樓第二會議室

♣ 第 253 次腎臟學學術討論會 ♣

【專題演講 1 】　主持人：吳麥斯 理事長

9:00-9:50　IgAN 治療新展望
楊皇煜 教授
林口長庚醫院腎臟科

9:50-10:00　討論

【病例討論】　主持人： 李國華 醫師

10:05 – 10:20　1. Renal papillary necrosis: an early presentation of renal tuberculosis in a 2-year-old girl
陳定遠[1] 鄭裕橙[1] 紀鑫[1] 林淳貞[1] 蔡政道[1]
[1]馬偕兒童醫院兒科部

10:20 – 10:35　2. Myeloproliferative neoplasm-related glomerulopathy
簡劭潔[1],陳泰迪[2],陳永昌[1],田亞中[1],方基存[1],楊智偉[1],塗昆樺[1],陳昭妤[1]
1 林口長庚醫院腎臟科, 2 林口長庚醫院病理科

10:35 – 10:50　3. Atypical anti-GBM glomerulonephritis
林哲毅[1],陳泰迪[2],陳永昌[1],田亞中[1],方基存[1],楊智偉[1],塗昆樺[1]
[1]林口長庚醫院腎臟科,[2]林口長庚醫院病理科

10:50 – 11:05　4. Left autonephrectomy due to end-stage of renal tuberculosis: A Case report.
張宇祺[1]，林于立[1,2]，王智賢[1,2]，徐邦治[1,2]
[1]花蓮佛教慈濟醫院腎臟內科,[2]花蓮慈濟大學醫學系

11:05 – 11:20　5. Fahr Syndrome in a Young Woman with Pseudohypoparathyroidism: A Case report.
張賀翔[1]，林于立[1,2]，王智賢[1,2]，徐邦治[1,2]
[1]花蓮佛教慈濟醫院腎臟內科,[2]花蓮慈濟大學醫學系

11:20 – 11:35　6. Barium Intoxication with Hypokalemia and Ventricular Tachycardia
江正淙[1] 黃道民[1] 翁德怡[2,3] 方震中[2] 黃政文[1]
[1]台灣大學附設醫院內科部腎臟科 [2]台灣大學附設醫院急診醫學部

11:35 － 11:50　7. Serendipitous Finding in CKD with Proteinuria: A Case of Rare Genetic Mutation in Tuberous Sclerosis Complex

邱瑜貞 丁瑞聰 巫宏傑 王偉傑
衛生福利部桃園醫院內科 腎臟科

11:50 － 12:05　8. Cause or Consequence? Lipid abnormalities and Apolipoprotein-E related Glomerular Disorders

柳向芃[1] 王偉傑[1] 巫宏傑[1] 丁瑞聰[1] 陳冬英[2]
[1]衛生福利部桃園醫院 腎臟科 [2]台北馬偕紀念醫院 病理科

12:05 － 12:20　9. Podocyte Infolding Glomerulopathy

陳柏宇[1],塗昆樺[1],陳泰迪[2],陳永昌[1],田亞中[1],方基存[1],楊智偉[1],
林展宇[1]
[1]林口長庚醫院腎臟科,[2]林口長庚醫院病理科

【專題演講 2 】

主題：慢性腎臟病之併發症的轉譯研究

地點：台北榮民總醫院致德樓第三會議室

主持人：林志慶 醫師

09:00 – 09:05　致詞

09:05 – 09:55　探討醛脫氫酶 2 和丙烯醛在慢性腎臟疾病中的相互作用
To elucidate the interplay of aldehyde dehydrogenase 2 and acrolein in chronic kidney diseases
王湘翠 副教授
陽明交通大學藥理所

09:55 – 10:45　慢性腎病中血管平滑肌轉分化在動脈鈣化中的機制與意義
Mechanism and implication of vascular smooth muscle transdifferentiation in arterial calcification in CKD
黎思源 醫師
台北榮民總醫院腎臟科

10:45 – 11:35　Multi-Omic Single-Cell Analysis to Investigate the Pathophysiology of Human Diseases
陳世淯 副研究員
中研院生醫所

11:35 – 11:50　討論與總結

【病例討論 **1**】

腎乳突壞死：一名二歲大女童的腎臟結核早期表現

Renal papillary necrosis: an early presentation of renal tuberculosis in a 2-year-old girl

陳定遠[1] 鄭裕橙[1] 紀鑫[1] 林淳貞[1] 蔡政道[1]

Ting-Yuan Chen, MD[1], Yu-Cheng Cheng, MD[1], Hsin Chi, MD[1], Chun-Chen Lin, MD[1], Jeng-Daw Tsai, MD[1]

[1]馬偕兒童醫院兒科部

[1]Department of Pediatrics, MacKay Children's Hospital, Taipei, Taiwan

Abstracts:

A previously healthy 2-year-old girl presented with a 3-month history of recurrent episodes of dysuria and pyuria after 3 weeks recovering from COVID-19 infection. Urinalysis revealed numerous WBCs/HPF and microscopic hematuria (20-50 RBCs/HPF), but no significant growth on multiple urine cultures. Episodes of turbid urine with some debris in the trapped urine were noted. Two febrile UTIs occurred during follow-up, but the fever lasted only 1-2 days after empirical antibiotic treatment. Initial renal ultrasonography showed normal right kidney and left mild hydronephrosis. No vesicoureteral reflux was noted on voiding cystourethrography. Despite broad-spectrum antibiotic treatment, recurrent sterile pyuria persisted. Two months later, ultrasonography revealed pelvicalyceal dilatation with thickening and irregularity of the pelvic wall, and some perihilar lymphadenopathies of the left kidney. Magnetic resonance urography showed the characteristic "golf ball-on-tee" and "lobster claw" signs, indicative of renal papillary necrosis. Furthermore, a thickened pelvic wall with relatively stenotic infundibulum and pelvis were noted.

Based on the imaging studies and medical history, renal tuberculosis was highly suspected. Both tuberculin skin test and interferon-gamma release assay were positive. Mycobacterial cultures of urine and gastric lavage all yielded *Mycobacterium tuberculosis*. Tests for human immunodeficiency virus were negative. No pulmonary or other extrapulmonary tuberculosis was found in the girl or her family. A 1-year TB regimen was prescribed with a 10-week intensive phase with isoniazid (H), rifampin (R), pyrazinamide (Z), and ethambutol for 6 weeks, then HRZ for 4 weeks, followed by a 42-week continuation phase with HR. Urinalysis normalized after 2 months of treatment. Long-term follow-up ultrasonography revealed left calyceal dilatation with some cavities on papillary area.

Renal tuberculosis is caused by hematogenous spread following a primary pulmonary infection. Mycobacteria remain silent until the altered interaction between the host immunity and bacterial virulence. Because of long incubation periods, renal tuberculosis is extremely rare in children. The role of COVID-19 in reactivation of tuberculosis is yet to be studied. However, recent studies reveal that COVID and tuberculosis share dysregulation of immune responses and favor reactivation of tuberculosis after recovering from COVID-19 infection.

Key words: Pediatric renal tuberculosis, renal papillary necrosis.

【病例討論 **2**】

骨髓增生性腫瘤所引起之腎絲球病變

Myeloproliferative neoplasm-related glomerulopathy

簡劭潔[1],陳泰迪[2],陳永昌[1],田亞中[1],方基存[1],楊智偉[1],塗昆樺[1],陳昭妤[1].
Shao-Chieh Chien[1], Tai-Di Chen[2], Yung-Chang Chen[1], Ya-Chung Tian[1], Ji-Tseng Fang[1], Chin-Wei Yang[1], Kun-Hua Tu[1], Chao-Yu Chen[1].
[1]林口長庚醫院腎臟科, [2]林口長庚醫院病理科
[1]Kidney Research center, Department of Nephrology, [2]Department of Pathology, Chang-Gung Memorial Hospital, Taoyuan, Taiwan

Abstract

Here, we present the case of a 72-year-old male with a medical history of primary myelofibrosis diagnosed 6 months before his referral to nephrology outpatient for generalized edema and proteinuria for three months. Laboratory tests were compatible with nephrotic syndrome and there was also newly diagnosed type 2 diabetes mellitus (HbA1c 7.0%). Autoimmune screening, serum and urine electrophoresis and immunofixation studies were unremarkable. A renal biopsy showed extramedullary hematopoiesis and chronic thrombotic microangiopathy, which were consistent with myeloproliferative neoplasm-related glomerulopathy. Ruxolitinib was instituted for his primary myelofibrosis.

Myeloproliferative neoplasms (MPN) are chronic clonal hematopoietic disorders with overproduction of differentiated hematopoietic cells. Clinical features of MPN-related glomerulopathy include chronic kidney disease, acute kidney injury or unexplained proteinuria. Pathology of MPN-associated glomerulopathy would show mesangial sclerosis and hypercellularity, segmental sclerosis, features of chronic thrombotic microangiopathy, and intra-capillary hematopoietic cell infiltration. Treatment of the underlying MPN may slow renal function decline.

This case should raise the awareness of MPN-assosciated glomerulopathy, which is an important differential diagnosis in an MPN patient with unexplained declined renal function or proteinuria.

關鍵字:骨髓增生性腫瘤、腎絲球病變。
Keywords: myeloproliferative neoplasm, glomerulopathy

【病例討論 **3**】

非典型抗腎絲球基底膜腎炎
Atypical anti-GBM glomerulonephritis

林哲毅[1],陳泰迪[2],陳永昌[1],田亞中[1],方基存[1],楊智偉[1],塗昆樺[1]
Che-Yih Lin[1], Tai-Di Chen[2], Yung-Chang Chen[1], Ya-Chung Tian[1], Ji-Tseng Fang[1], Chin-Wei Yang[1], Kun-Hua Tu[1]
[1]林口長庚醫院腎臟科, [2]林口長庚醫院病理科
[1]Kidney Research center, Department of Nephrology, [2]Department of Pathology, Chang-Gung Memorial Hospital, Taoyuan, Taiwan

Abstract

We report a case of a 27-year-old man who presented with rapidly progressive glomerulonephritis. The patient initially sought medical help for significant proteinuria, severe hematuria, and a progressive decline in renal function. Initial laboratory evaluations did not identify a specific underlying disease, and testing for anti-glomerular basement membrane (anti-GBM) antibodies was negative. However, a kidney biopsy revealed linear immunoglobulin deposition consistent with anti-GBM glomerulonephritis. Despite aggressive treatment, including pulse steroid therapy, plasma exchange, and rituximab, his renal function did not improve. The patient was eventually discharged against medical advice, seeking further treatment elsewhere. He subsequently returned to the nephrology clinic and is now dependent on lifelong hemodialysis.

Anti-glomerular basement membrane (anti-GBM) disease is a rare condition, with an annual incidence of approximately 1 case per million people. Atypical anti-GBM disease accounts for about 10% of all cases. In contrast to typical anti-GBM disease, atypical cases are characterized by the absence of detectable circulating antibodies, despite the presence of the hallmark linear immunoglobulin deposition along the glomerular basement membrane. It is crucial to differentiate atypical anti-GBM disease from other conditions that also exhibit linear immunoglobulin deposition along the glomerular basement membrane, such as diabetic nephropathy, monoclonal immunoglobulin deposition disease, and fibrillary glomerulonephritis. Although atypical anti-GBM disease is generally reported to have a slower progression, careful consideration in treatment is essential due to the incomplete understanding of its pathogenesis and the potential for diverse disease mechanisms.

關鍵字: 非典型抗腎絲球基底膜腎炎
Keywords: atypical anti-GBM disease

【病例討論 **4**】

腎臟結核桿菌感染引起左側腎臟完全喪失功能：一病例報告

Left autonephrectomy due to end-stage of renal tuberculosis: A Case report.

張宇祺 [1]，林于立 [1,2]，王智賢 [1,2]，徐邦治 [1,2]

Yu Chi Chang[1], Yu-Li Lin[1, 2], Chih-Hsien Wang [1, 2], Bang-Gee Hsu[1, 2]

[1] 花蓮佛教慈濟醫院腎臟內科, [2] 花蓮慈濟大學醫學系

[1] Division of Nephrology, Hualien Tzu Chi Hospital, Buddhist Tzu Chi Medical Foundation, Hualien, [2] School of Medicine, Tzu Chi University, Hualien, Taiwan

Abstracts

Background:

Renal tuberculosis (TB), a form of genitourinary TB, constitutes 15-20% of extra-pulmonary TB cases and can present with diverse and significant radiographic findings. Autonephrectomy, the final stage of chronic renal TB infection, results from caseous necrosis and progressive cavitation of the kidney. We present the following case.

Case report:

A 66-year-old female beverage vendor from Hualien City, with a history of multiple left renal cysts since 2015 and pulmonary TB treated completely in 2022, presented to our nephrology outpatient department. She was concerned about a suspicious left renal mass identified during a health examination and was worried about her renal function. The patient denied any symptoms such as dysuria, urinary frequency, urgency, flank or lower back pain. Additionally, she had no fever, chills, general malaise, weight loss, or night sweats. Physical examination was unremarkable, and no tenderness was noted on back percussion. Initial investigations included urine analysis, serum creatinine (CRE), cystatin C, HBs-Ag, Anti-HCV Ab, and renal sonography. The urine analysis showed no pyuria, proteinuria, or hematuria, and the renal sonography indicated mild right hydronephrosis and two left renal cysts with some internal heterogeneous hypoechogenicity, suggestive of a renal mass. Laboratory results showed blood urea nitrogen (BUN) at 14 mg/dL, creatinine (CRE) at 0.68 mg/dL, eGFR at 92.01 mL/min, cystatin C at 1.05 mg/L, eGFRcys at 66.3 mL/min, potassium (K) at 3.9 mmol/L, calcium (Ca) at 2.24 mmol/L, and albumin (BCG method) at 4.2 g/dL. Both HBs-Ag and Anti-HCV Ab were non-reactive. All values were within the reference range. Further imaging with abdominal and pelvic contrast CT was performed. The CT scan revealed that the left kidney had transformed into an enlarged, possibly debris-filled caseated sac, with significant parenchymal loss and dense calcification, likely non-functioning, consistent with left autonephrectomy secondary to end-stage renal TB.

Conclusion:

This 66-year-old woman, with a history of pulmonary TB infection, had a suspicious left renal mass which was ultimately diagnosed as left autonephrectomy due to the end-stage of renal TB.

Keyword: Renal tuberculosis, kidney tuberculosis, autonephrectomy, hydronephrosis.

【病例討論 **5**】

一名假性副甲狀腺功能低下年輕女性的 **Fahr** 氏症候群**:** 病例報告

Fahr Syndrome in a Young Woman with Pseudohypoparathyroidism: A Case report.

張賀翔 [1]，林于立 [1,2]，王智賢 [1,2]，徐邦治 [1,2]

Ho-Hsiang Chang[1], Yu-Li Lin[1, 2], Chih-Hsien Wang [1, 2], Bang-Gee Hsu[1, 2]

[1] 花蓮佛教慈濟醫院腎臟內科, [2] 花蓮慈濟大學醫學系

[1]Division of Nephrology, Hualien Tzu Chi Hospital, Buddhist Tzu Chi Medical Foundation, Hualien, [2]School of Medicine, Tzu Chi University, Hualien, Taiwan

Abstracts

Background:

Fahr syndrome is a rare neurological disorder characterized by abnormal calcified deposits in the basal ganglia, dentate nucleus, and cerebral cortex, leading to various neurological abnormalities. Unlike Fahr disease, parathyroid hormone abnormalities are the most common secondary to known etiologies. Functional hypoparathyroidism should be considered in patients with normal renal function presenting with hypocalcemia and hyperphosphatemia. Pseudohypoparathyroidism (PHP) is distinguished from hypoparathyroidism by increased serum PTH levels. Different types of PHP exist, including type 1a (associated with Albright hereditary osteodystrophy), pseudo-PHP, and type 1b (PTH resistance without osteodystrophy), all caused by defects in the imprinted GNAS1 gene.

Case report:

A 19-year-old woman with a history of epilepsy since age 10 had been treated with levetiracetam and valproic acid. On May 12, 2022, she experienced generalized tonic-clonic seizures. At the neurologist's clinic, blood tests revealed hypocalcemia (Ca 1.48 mmol/L), hypomagnesemia (1.6 mg/dL), and hyperphosphatemia (6.4 mg/dL). Computed tomography of the brain showed extensive calcified lesions over bilateral basal ganglia, the gray-white matter interface extending from the frontal to the parietal lobes, and cerebellar dentate nuclei. This pattern was suggestive of Fahr syndrome. Imaging was negative for mass lesions or bleeding. Her anti-epileptic medication was changed to levetiracetam and lamotrigine, and she was prescribed calcium carbonate for hypocalcemia. One month later, her serum calcium level had increased to 1.62 mmol/L. As there were no seizure episodes after calcium supplementation, lamotrigine was discontinued on April 14, 2023. Upon referral to a nephrologist, her iPTH level was 308.9 pg/mL and calcitriol 17.6 ng/mL. PHP was suspected, and a genetic test was recommended. However, due to financial constraints, the patient could not afford it. Treatment with calcium carbonate, calcitriol, magnesium oxide, and levetiracetam led to a stable clinical condition.

Conclusion:

Patients with PHP typically present with severe hypocalcemia and elevated parathyroid hormone (PTH) levels. For those exhibiting neurological symptoms, brain imaging may be warranted to evaluate for Fahr syndrome, a rare condition characterized by abnormal calcifications in the brain. Early recognition and appropriate management of PHP are crucial to prevent the progression of neurological manifestations, underlining the importance of timely diagnosis and treatment in these cases.

Keywords: Pseudohypoparathyroidism、Fahr syndrome

【病例討論 **6**】

鋇劑中毒合併低血鉀及心室頻脈

Barium Intoxication with Hypokalemia and Ventricular Tachycardia

江正浤 [1] 黃道民 [1] 翁德怡 [2,3] 方震中 [2] 黃政文 [1]

Zheng-Hong, Jiang MD.[1], Thomas Tao-Min Huang, MD.[1], Te-I Weng MD. [2,3], Cheng-Chung Fang MD[2,3], Jenq-Wen Huang MD. PhD.[1]

[1]台灣大學附設醫院內科部腎臟科 [2]台灣大學附設醫院急診醫學部

[1]Division of Nephrology, Department of Internal Medicine, [2]Department of Emergency Medicine, [3]Forensic and Clinical Toxicology Center, National Taiwan University Hospital and College of Medicine, Taipei City, Taiwan.

Background：

Barium intoxication is a rare but notable cause of hypokalemia. The clinical presentation of barium intoxication can range from mild symptoms, such as nausea and vomiting, to severe conditions, including arrhythmias and paralysis, which may lead to cardiac arrest or respiratory failure. Prompt diagnosis of barium intoxication is crucial for timely management, but it remains a clinical challenge.

Methods

A 37-year-old man presented to an emergency department with vomiting, abdominal pain, and general weakness. Two hours after arrival, he was found unresponsive and pulseless. Cardiac pulmonary resuscitation (CPR) was initiated, and ventricular tachycardia was observed during resuscitation. Laboratory results revealed hypokalemia (2.43 mmol/L) and hypercapnia (PCO2 83.8 mmHg). The patient achieved a return of spontaneous circulation following CPR. Despite serial potassium supplementation, he continued to experience hypokalemia and recurrent ventricular tachycardia, leading to another cardiac arrest. Extracorporeal membrane oxygenation (ECMO) was initiated, and the patient was transferred to the intensive care unit for further management.

Results

Following potassium supplementation at a rate of 20 mEq/hr for 24 hours, the patient’s potassium level suddenly spiked from 3.37 to 8.87 mmol/L in a 2-hour interval. Hemodialysis was initiated to manage hyperkalemia in the context of oliguria. A CT scan revealed hyperdense material within the bowel lumen, leading to a high suspicion of barium intoxication, which was later confirmed through laboratory testing. The patient's plasma barium level was 14,498.02 μg/L, and the urine barium level was 646.39 μg/L. After appropriate treatment, the patient was successfully weaned off hemodialysis and ECMO and transferred to the general ward. His hypokalemia improved, and he was later discharged.

Conclusions

Prompt recognition of barium intoxication is crucial for comprehensive management, including cardiac, respiratory, and renal support. Rebound hyperkalemia should be anticipated, with close monitoring of potassium levels.

Keywords

Barium intoxication, hypokalemia, ventricular tachycardia, hemodialysis

【病例討論 **7**】

CKD 合併蛋白尿患者中的偶然發現：結節性硬化症罕見基因突變病例報告

Serendipitous Finding in CKD with Proteinuria: A Case of Rare Genetic Mutation in Tuberous Sclerosis Complex

邱瑜貞 丁瑞聰 巫宏傑 王偉傑

Yu-Chen Chiu, Jui-Tsung Ting, Hung-Chieh Wu, Wei-Jie Wang

衛生福利部桃園醫院內科 腎臟科

Division of Nephrology, Department of Internal Medicine, Taoyuan General Hospital, Ministry of Health and Welfare, Taoyuan, Taiwan

Abstracts - A 61-year-old female was referred to our hospital due to declining renal function. Her medical history includes several years of epilepsy, hypertension, and pleomorphic carcinoma (pT2aN0), for which she underwent right upper lobectomy on July 11, 2023, followed by four rounds of chemotherapy. Laboratory data revealed a serum creatinine level of 2.1 mg/dL and a urine protein-to-creatinine ratio of 6554 mg/g. A renal ultrasound failed to detect the entire kidney border, and corticomedullary differentiation was lost. Chest-to-pelvis computed tomography scan revealed numerous ill-defined tumors with macroscopic fat within the bilateral renal parenchyma, suggestive of bilateral renal angiomyolipomas (AML). We also noted three dermal hard nodules on her nose, one ungual fibroma on her left fourth toe, and several tiny hypomelanotic macules on the anterior chest wall. Brain magnetic resonance imaging also showed multiple small subependymal nodules and several small high-signal intensity lesions in the bilateral frontal, parietal, and temporal regions on T2WI and FLAIR sequences, consistent with tuberous sclerosis with subependymal and cortical/subcortical tubers. Echocardiography and ophthalmoscopy showed no evidence of cardiac rhabdomyoma or retinal hamartomas. A genetic study confirmed a pathogenic variant in the TSC2 gene (TSC2: NM_000548: c.[1249C>T]；[1259=].Q417X), forming a premature stop codon and affecting gene function. This genetic variation is very rare and is not recorded in the genome aggregation database or the Taiwan Biobank. It has only been reported in five cases in the Leiden Open Variation Database and is considered pathogenic. Tuberous sclerosis complex (TSC) is an autosomal dominant disorder caused by pathogenic variants in TSC1 or TSC2, leading to inactivation of the tuberin-hamartin complex and hyperactivation of the mTOR signaling pathway. TSC affects multiple organ systems, manifesting as seizures, facial angiofibromas, hypomelanotic macules, shagreen patches, retinal hamartomas, renal AML, subependymal nodules, giant cell astrocytomas, or cardiac rhabdomyomas. mTOR inhibitors can be used as adjunctive treatment for seizures, reducing the volume of multiple renal AMLs with declining renal function, and for symptomatic subependymal giant cell astrocytomas that cannot be surgically treated. Keywords : tuberous sclerosis complex, renal angiomyolipoma, genetic study, TSC2, mTOR inhibitors

【病例討論 **8**】

高血脂是因還是果？脂質代謝異常與脂載蛋白 E 相關腎絲球疾病 Dyslipidemia: Cause or Consequence? Lipid abnormalities and Apolipoprotein-E related Glomerular Disorders

柳向芃[1] 王偉傑[1] 巫宏傑[1] 丁瑞聰[1] 陳冬英[2]
Hsiang-Peng Liu, Wei-Jie Wang[1], Jui-Tsung Ting[1], Hun-Chieh Wu[1], Tung-Ying Chen[2]
[1]衛生福利部桃園醫院 腎臟科 [2]台北馬偕紀念醫院 病理科
[1]Division of Nephrology, Taoyuan General Hospital, Ministry of Health and Welfare, Taoyuan, Taiwan
[2]Department of Pathology, Taipei Branch, MacKay Memorial Hospital, Taipei, Taiwan

<Abstract>

We report a 45 y/o man with lung adenocarcinoma under regular bevacizumab infusion and oral erlotinib for 3 years. In 2024 May, foamy urine was found. Lab data revealed normal renal function, with only mild dyslipidemia (triglyceride: 125mg/dL). Subnephrotic range proteinuria (UPCR: 0.523 g/g to 2.947 g/g) was found. As glomerulonephritis survey yielded negative result, renal biopsy was performed in June. Pathology revealed podocyte foot processes effacement, and variable sizes of granules and microbubbles in the subepithelial areas and capillary lumens, compatible with apolipoprotein E (ApoE) related glomerular disease. He then received fenofibrate and atorvastatin from OPD. Improving of proteinuria was found after serum lipid level decreased.

ApoE-related glomerular disease is characterized clinically by proteinuria and elevated concentrations of triglyceride-rich lipoproteins and their remnants. The apolipoprotein E plays a main role in chylomicron, very-low-density lipoprotein (VLDL) and low-density lipoprotein (LDL) metabolism. The apoE isoforms and gene mutation could lead to the impaired clearance of the lipoproteins and subsequent lipid deposition in the kidney. The human APOE gene has 3 alleles and express apoE isoforms E2, E3, and E4, respectively. ApoE3 homozygote is the most common found isoform combination with normal lipid metabolism ability. ApoE2 homozygote is found unable to bind to the LDL receptor, leading to lipid clearance defect. Other than apoE2 homozygote, lipoprotein glomerulopathy, characterized by dilated glomerular capillaries with lamella lipoprotein thrombi, was also found. It is caused by missense mutation on APOE gene, leading to the structure change of apoE protein chain, causing reduced stability and more degradation of apoE protein.

Lack of specific therapies for the apoE-related glomerular disease was noted due to the rareness of the cases. Regimens for proteinuria and hyperlipidemia were found to be effective for apoE-related glomerular disease, including fibrates, Staphylococal protein-A, and ACEi/ARB.

The apoE-related glomerular disease is rare, with less than 10 cases has been reported in Taiwan. Through the case we may furtherly study and investigate the disease condition and distribution in Taiwan.

Keywords: Apolipoprotein E, apoE-related glomerular disease, dyslipidemia, fenofibrate

【病例討論 **9**】

足細胞內陷性腎絲球病變

Podocyte Infolding Glomerulopathy

陳柏宇[1], 塗昆樺[1], 陳泰迪[2], 陳永昌[1], 田亞中[1], 方基存[1], 楊智偉[1], 林展宇[1]
Po-Yu Chen[1], Tai-Di Chen[2], Yung-Chang Chen[1], Ya-Chung Tian[1], Ji-Tseng Fang[1], Chih-Wei Yang[1], Chan-Yu Lin[1]
[1]林口長庚醫院腎臟科, [2]林口長庚醫院病理科
[1]Department of Nephrology, [2]Department of Pathology, Chang-Gung Memorial Hospital, Taoyuan, Taiwan

Podocyte infolding glomerulopathy is a newly defined rare glomerular injury characterized by microstructures originating from the cytoplasmic invagination of podocytes in the glomerular basement membrane (GBM). Most of the reported cases were associated with connective tissue diseases such as lupus nephritis, Sjögren's syndrome, scleroderma, etc. However, the exact mechanisms and clinical significance of this unique pattern of glomerular injury remain unclear and need further clarification.

This is a case of a 60-year-old female patient with a past history of papillary thyroid carcinoma, status post total thyroidectomy in 2007, and left intrahepatic duct stone. She had regular follow-up at our Gastroenterology outpatient department. This time, she was referred to our Nephrology outpatient department in November 2023 due to bilateral lower limb edema for 2 weeks, associated with hypertension. Preliminary laboratory data revealed hypoalbuminemia (2.8 g/dL) with nephrotic-range proteinuria. Urinalysis showed heavy proteinuria with microscopic hematuria. Due to the above condition, admission was arranged for a kidney biopsy evaluation. After admission, a comprehensive laboratory workup for glomerulonephritis revealed an elevated Antinuclear antibody (ANA) level (1:640, speckled pattern), decreased C3 and C4 levels (39.2 and 5.0 mg/dL, respectively), and an equivocal Anti-dsDNA level. Kidney ultrasound showed both kidneys to be of normal size with parenchymal renal disease and mild left pelviectasis. A kidney biopsy was performed by a radiologist on January 17, 2024, and the pathology results were suggestive of podocyte infolding glomerulopathy. The patient was then discharged from the Nephrology ward and has been under regular follow-up at our Nephrology and Rheumatology outpatient clinics. At our Rheumatology outpatient clinic, further workup revealed elevated anti-SSA and anti-SSB levels (252 and 412 U/mL, respectively). Based on the clinical presentation, Sjögren's syndrome was diagnosed, and hydroxychloroquine was prescribed.

This case highlights the diagnosis of this unique pattern of glomerular injury and its association with other autoimmune diseases, warranting further investigation to achieve an accurate diagnosis and appropriate treatment of the underlying conditions.

Keyword: Podocyte infolding glomerulopathy, Connective tissue disease
關鍵字: 足細胞內陷性腎絲球病變, 結締組織疾病

【專題演講 2 】

【2-1】

探討醛脫氫酶 2 和丙烯醛在慢性腎臟疾病中的相互作用

To elucidate the interplay of aldehyde dehydrogenase 2 and acrolein in chronic kidney diseases

陽明交通大學藥理所 王湘翠副教授

Variations in chronic kidney disease (CKD) incidence among different racial groups arise from both genetic and environmental factors. In East Asians, the Glu504Lys polymorphism in aldehyde dehydrogenase 2 (ALDH2) is common, impairing the enzyme's ability to detoxify harmful aldehydes like acrolein, which is linked to decreased kidney function. Acrolein, an α,β-unsaturated aldehyde, can be generated within the body through lipid peroxidation. Our study examines how changes in acrolein levels and ALDH2 contribute to kidney fibrosis. Clinical data show correlations between ALDH2 expression, estimated glomerular filtration rate, urinary acrolein levels, and the severity of kidney fibrosis. Reduced ALDH2 levels are associated with poorer outcomes in CKD patients. In mouse models of unilateral ureteral obstruction and folic acid nephropathy, increased acrolein levels and decreased ALDH2 expression are evident, especially in Glu504Lys knock-in mice. Acrolein buildup disrupts pyruvate kinase M2 function, causing its migration from the cytosol to the nucleus in kidney tubular epithelial cells, which affects mitochondrial function and leads to tubular damage and progressive fibrosis. Increasing ALDH2 expression via adeno-associated virus vectors lowers acrolein levels and reduces fibrosis in both wild-type and Glu504Lys knock-in mice. These findings suggest that targeting the interaction between ALDH2 and acrolein could offer a new therapeutic approach for CKD patients.

【2-2】

“慢性腎病中血管平滑肌轉分化在動脈鈣化中的機制與意義”

Mechanism and implication of vascular smooth muscle transdifferentiation in arterial calcification in CKD

台北榮民總醫院腎臟科 黎思源醫師

Arterial medial calcification (AMC) is a common and detrimental complication in chronic kidney disease (CKD), significantly contributing to increased mortality. Currently, there are no effective treatments to prevent or slow AMC, which underscores the urgent need for novel therapeutic approaches. AMC shares similarities with bone formation processes, where vascular smooth muscle cells (VSMCs) transform into cells resembling osteoblasts and chondroblasts, promoting vascular tissue mineralization. This transformation involves changes in VSMC phenotype and gene expression, notably with the induction of osteogenic transcription factors such as RUNX2, which plays a critical role in AMC development.

Research has shown that manipulating RUNX2 activity can influence vascular calcification. Reducing RUNX2 expression can reduce AMC, while RUNX2 overexpression accelerates it. Despite these promising results, targeting RUNX2 directly is challenging due to its broad expression and vital role in bone development. RUNX2 deficiencies are associated with severe skeletal abnormalities, complicating efforts to inhibit it without affecting bone health.

An alternative approach is to target cofactors that assist RUNX2 in its role. Among these, the Four-and-a-half LIM (FHL) proteins, particularly FHL2, show promise. FHL2 acts as a cofactor for RUNX2 in VSMCs and is upregulated in CKD, where it helps RUNX2 drive the transformation of VSMCs and promote vascular calcification. Notably, FHL2 is predominantly found in cardiovascular tissues rather than in bones, suggesting that inhibiting it might reduce arterial calcification without impacting bone health. Preclinical studies using FHL2 knockout mice support this potential. Overall, targeting the RUNX2-FHL2 pathway could be an effective strategy for managing CKD-related vascular calcification and improving patient outcomes.

【2-3】

“Multi-Omic Single-Cell Analysis to Investigate the Pathophysiology of Human Diseases”

中研院生醫所　陳世淯副研究員

The delineation of individualized biology at the single cell level has been a mainstay of immunologic inquiry. For examples, the introduction of the use of specific staining reagents for flow cytometry revolutionized our understanding of cellular individuality in immune function. At the other end of the spectrum, biochemical approaches using bulk assay techniques were making significant headway in understanding signaling pathways, phosphorylation, and other attributes of cellular physiology. Concomitantly, biologists desired to measure more events per sample in a process that has now led to the understanding that cells operate as complex networks-- and that to understand network biology requires as much a systems approach of measuring multiple component parts simultaneously as well as ascribing those functions to individual cells. This comes astride technical advances that have reached a point where it is possible to study many cellular functions down to the level of the single cell.

My lab focuses on creating innovative single-cell analysis tools and harnessing advanced technologies to tackle key biomedical and clinical challenges related to the immune system. Our goal is to uncover the fundamental mechanisms governing the immune response to invading pathogens and cancer cells within the tumor microenvironment. In this presentation, I will discuss our recent efforts to integrate diverse 'omics' approaches, allowing us to draw data-driven connections between different pathways as T cells and NK cells undergo exhaustion within the local environment. We will also examine how these insights correlate with clinical outcomes.

台灣腎臟醫學會

第 108 次透析人員在職繼續教育課程

【北部場次】

時間：113 年 9 月 22 日(星期日) 09:00—11:50
地點：台北榮民總醫院 介壽堂
主題：腎臟與其他器官的對話（crosstalk）

主持人：楊智宇 醫師

09:00－09:40 1、心血管腎臟新陳代謝症候群(CKM syndrome)
李國華 醫師
臺北榮民總醫院 腎臟科

09:40－10:20 2、肝腎症候群 (Hepatorenal syndrome)
張智翔 醫師
林口長庚醫院 腎臟科

10:20－10:30 休 息

10:30－11:10 3、腸-腎軸(Gut-Kidney Axis)與腸道菌
張瑞廷 醫師
新光醫院 腎臟科

11:10－11:50 4、肺腎症候群(Pulmonary-renal syndrome)
賴俊夫 醫師
台大醫院 腎臟科

台灣腎臟醫學會

第 108 次透析人員在職繼續教育課程

【中部場次】

時間：113 年 9 月 22 日(星期日) 09:00—11:50
地點：台中榮民總醫院研究大樓 2F 第一會場
主題：腎臟與其他器官的對話（crosstalk）

主持人： 游棟閔 醫師

09:00－09:40　1、心血管腎臟新陳代謝症候群(CKM syndrome)
王彩融 醫師
臺中榮民總醫院 腎臟科

09:40－10:20　2、肝腎症候群 (Hepatorenal syndrome)
邱炳芳 醫師
彰化基督教醫院 腎臟科

10:20－10:30　休　息

10:30－11:10　3、腸-腎軸(Gut-Kidney Axis)與腸道菌
吳再坤 醫師
童綜合醫院 腎臟科

11:10－11:50　4、肺腎症候群(Pulmonary-renal syndrome)
周哲毅 醫師
亞洲大學附屬醫院 腎臟科

台灣腎臟醫學會

第 108 次透析人員在職繼續教育課程

【南部場次】

時間：113 年 9 月 22 日(星期日) 09:00—11:50
地點：高雄醫學大學附設醫院啟川大樓 6 樓第一講堂
主題：腎臟與其他器官的對話（crosstalk）

♬♬

主持人： 邱怡文 醫師

09:00－09:40 1、心血管腎臟新陳代謝症候群(CKM syndrome)
鄭本忠 醫師
高雄長庚醫院 腎臟科

09:40－10:20 2、肝腎症候群 (Hepatorenal syndrome)
張敏育 醫師
義大醫院 腎臟科

10:20－10:30 休 息

10:30－11:10 3、肺腎症候群(Pulmonary-renal syndrome)
郭德輝醫師
成大醫院 腎臟科

11:10－11:50 4、腸-腎軸(Gut-Kidney Axis)與腸道菌
吳秉勳 醫師
高雄醫學大學附設醫院 腎臟科